Exhibit A16

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

January 17, 2022
Project No. 22-5974

Bill Wagoner & Todd Boyce
Westwood Homes, LLC.
12700 NW Cornell Road
Portland, Oregon 97229
Via email: bill@westwoodhomesllc.com; todd@westwoodhomesllc.com

CC: Matt Sprague, Pioneer Design Group: MSprague@pd-grp.com

SUBJECT: CLEAN WATER SERVICES SLOPE SETBACKS
CEDAR CREEK GARDENS
16871 & 17033 SW BROOKMAN ROAD
SHERWOOD, OREGON

This letter report presents our review of on-site natural slopes pertaining to Clean Water Services (CWS) slope setbacks. The subject site is located on the north side of SW Brookman Road in the City of Sherwood, Washington County, Oregon (Figures 1 through 3). The property is approximately 20 acres in size. Cedar Creek diagonally bisects the property and an unnamed tributary drainage to Cedar Creek is located near the southwestern property line (Figures 2 and 3). Natural site grades within the limits of the proposed development range from approximately 3 to 22 percent with steeper grades adjacent to Cedar Creek and the unnamed tributary drainage to Cedar Creek (Figure 4). Based on the site topographic mapping, maximum slopes adjacent to Cedar Creek and the tributary drainage range from 10 to 24 feet and are on the order of 25 to 50 percent grade.

Clean Water Services (CWS) allows a reduction of the 35-foot setback from the break in slope to 15 feet with a geotechnical engineer's review. GeoPacific's evaluation of the slope stability setback was based on a geologic reconnaissance, review of site specific topographic survey and published geologic mapping, and subsurface explorations consisting of four test pits and one hand auger boring. Visual criterion considered by the geologist when evaluating slope stability included topographic grade and smoothness or regularity; degree of creep; age, density, condition and degree on deformity of native trees; and evidence of erosion and past fill placement.

Our reconnaissance of the moderately to steeply sloping portion of the site (immediately adjacent to Cedar Creek and the unnamed tributary drainage to Cedar Creek) indicates slopes are generally smooth and uniform (Figures 2 & 4) and stable. No landslides are mapped on the site by the Oregon Department of Geology and Mineral Industries, as presented on Figure 2 (DOGAMI Slido, 2022). Explorations indicate that the slopes adjacent to the Cedar Creek drainages are underlain by stiff to medium stiff to very stiff, clayey silt (ML) underlain by medium stiff to stiff, silt (ML). These materials are considered moderately resistant to slope stability on moderately sloping topography. No springs or seeps were observed. Based on our reconnaissance, shallow subsurface explorations, and information available at present, a 15 foot offset from the break in

slope is adequate to maintain slope stability along the vegetated corridor. According to the Oregon HazVu: Statewide Geohazards Viewer, the majority of the subject site is regionally characterized as having a low risk of soil liquefaction with the sloping areas adjacent to the drainages mapped as having a high risk of soil liquefaction (DOGAMI: HazVu, 2022). If additional assessment of the liquefaction potential and lateral spread risk of the subject site during a seismic ground shaking event is desired by the client, additional subsurface exploration consisting of Cone Penetrometer Testing (CPT) and quantitative liquefaction analysis (beyond the scope of this investigation) could be conducted.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

Beth K. Rapp, C.E.G.
Senior Engineering Geologist

James D. Imbrie, G.E., C.E.G.
Principal Geotechnical Engineer

Attachments: Figure 1 - Vicinity Map
Figure 2 - Lidar Based Vicinity Map - with Mapped Landslides
Figure 3 - Lidar Based Vicinity Map - with Liquefaction Hazard
Figure 4 - Site Grading Plan and Exploration Locations
Test Pit Logs (TP-1 through TP-4)
Hand Auger Logs (HA-1)

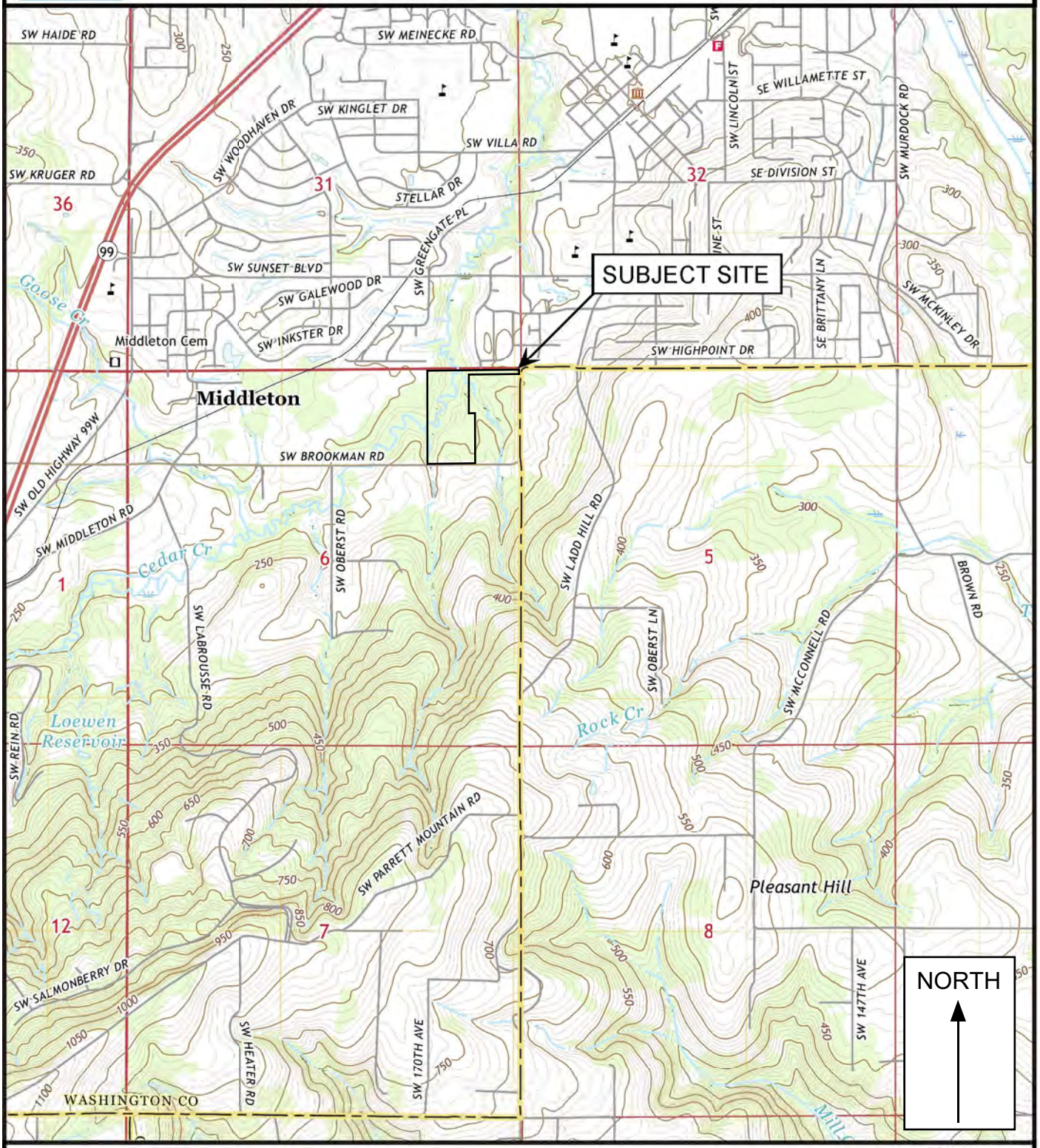
References:

Oregon Department of Geology and Mineral Industries, 2022, Oregon Hazvu: Statewide Geohazards Viewer: https://gis.dogami.oregon.gov/hazvu/

Oregon Department of Geology and Mineral Industries, 2022, SLIDO: Statewide Landslide Information Database for Oregon: https://gis.dogami.oregon.gov/slido/

GEOPACIFIC
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 feet

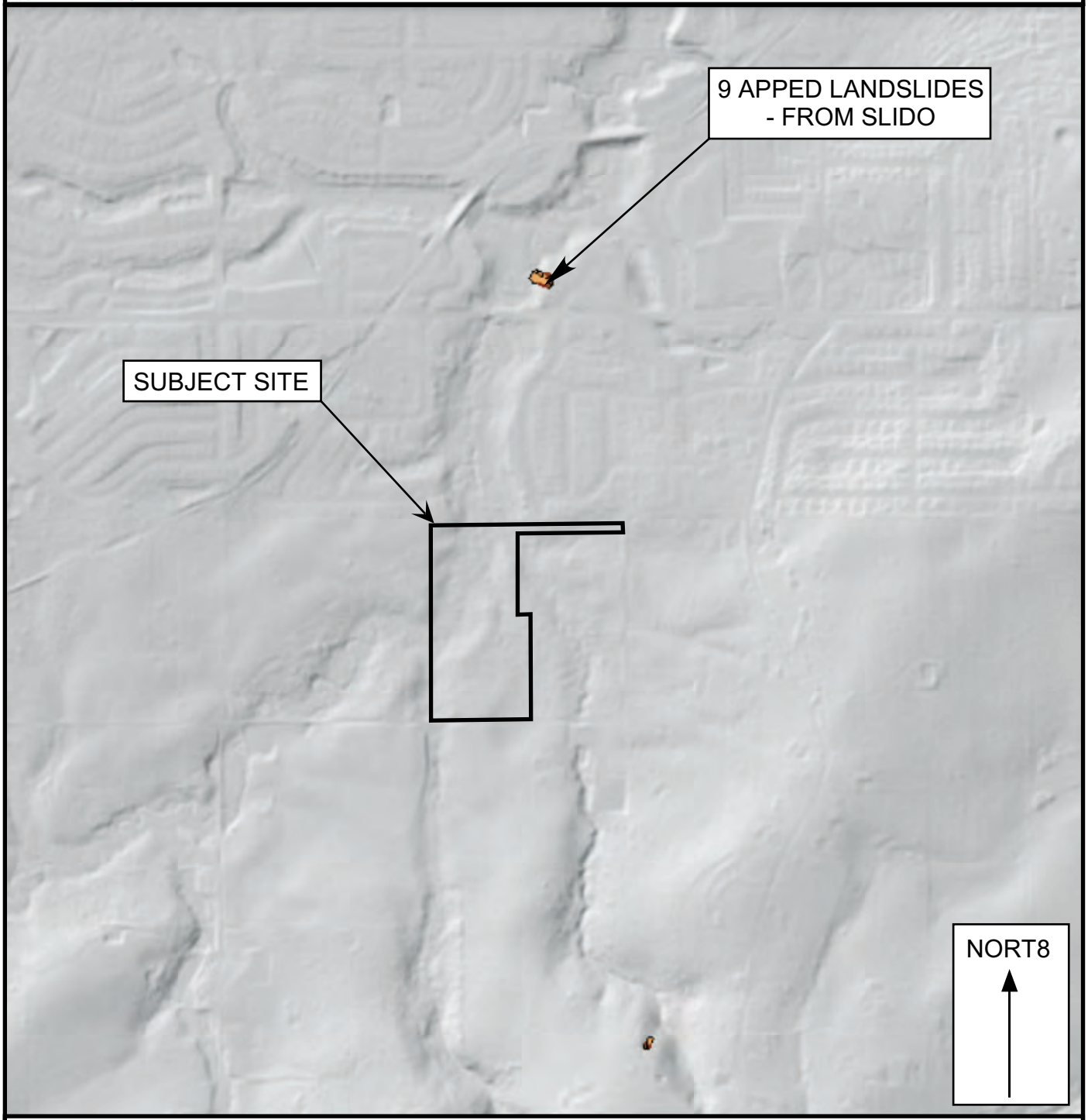
Date: 1/17/2022
Drawn by: EKR

Base map: U.S. Geological Survey 7.5 minute Topographic Map Series, Sherwood, Oregon Quadrangle, 2020.

Project: Cedar Creek Gardens Sherwood, Oregon	Project No. 22-5974	FIGURE 1

14835 SW 72n¸ A°˜˝ e
Portland, Oregon 97224
T˜ l: (˘,˘- 598-8445

LIDAR BASED VICINITY MAP - WITH MAPPED LANDSLIDES



Legend

Approx˜ ate Scale 1 in = 1,000 ft

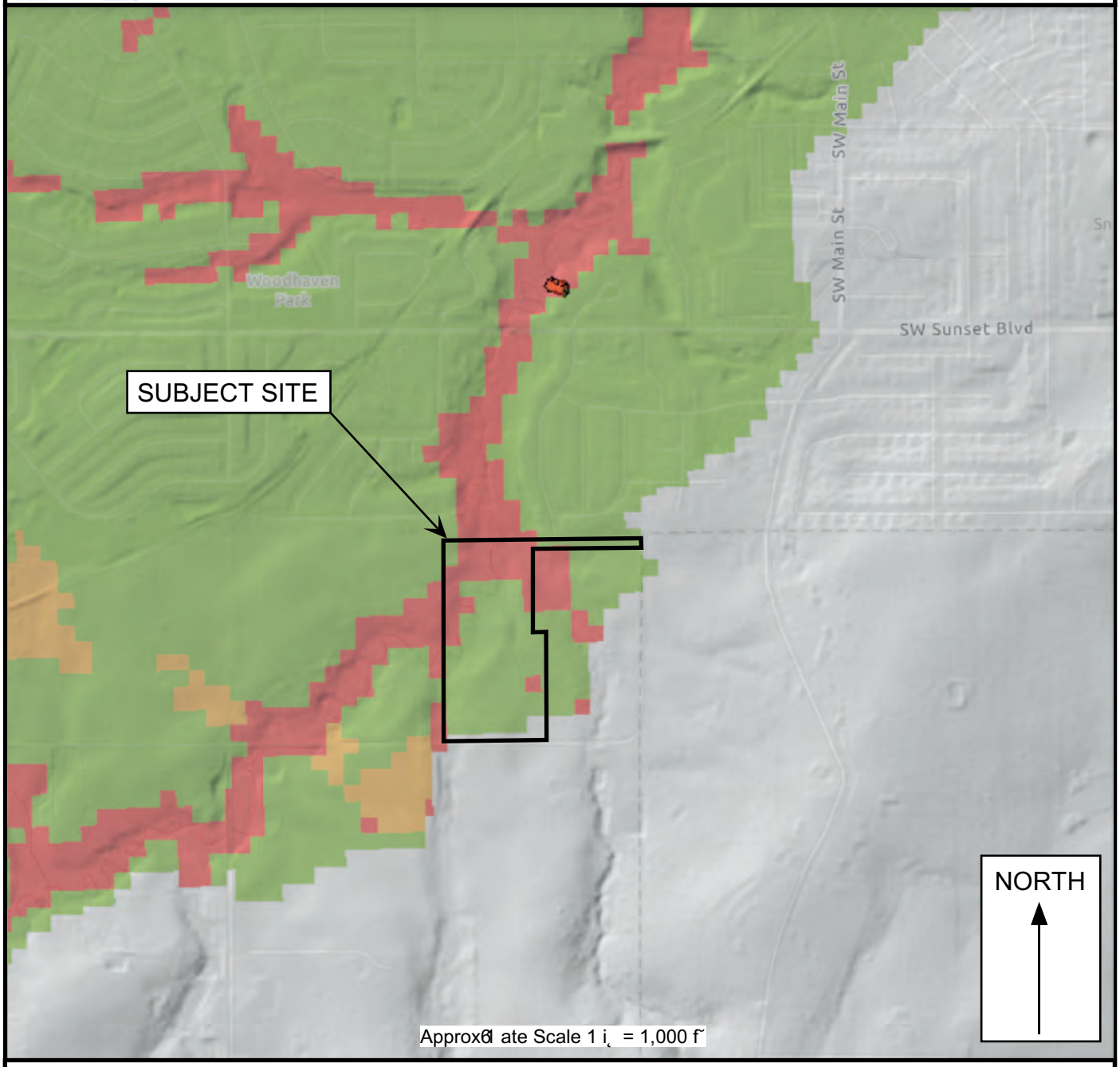
#˙ te: 1/17/2022
#r˙$ n by: EKR

Base map: Oregon Department of Geolog& and M˜ner˙¸ Industr˜e2 2022, Statew˜de Landsl˜de Infor^ ation Database for Oregon (SLID4<: https://g˘s.dog˙˜˜ +oregon.go=(maps/sl˜do/

Project: 0 edar Creek Gardens Sher$ ood, Oregon	Project No. 22--.)/	FIGURE 2

14835 SW 72n! A"# $e
Po&() ! , Oreg% 97224
T#I: (¸/˝0 598-8445

LIDAR BASED VICINITY MAP WITH LIQUEFACTION HAZARD



KEY

- H60h Li?uefaction H˙ 8˙ r+
- 5 oderate Li?uefaction H˙ 8˙ r+
- Low Li?uefaction H˙ 8˙ r+
- No Li?uefaction H˙ 8˙ r+ Mapped

ˆ ˙ te: 1/17/2022
Dr˙˝ n by: EK

Base maps: Ore0on Department of Geolog˜ and M6ner˙4 Industr6s, 2022, Ore0on Haz97: Statew6le Geohazards Vie˝ er and Statew6le Landsl6le Infor1 ˙˜6on D˙ tabase for Oregon (SLIDO=˝ .˜˜2-˙""06s.dog˙16 &regon.go9".˙8 97/ and h˜˜2-˙""06s.dog˙16 &regon.go9"1˙2-"-4 6-o/

Project: Cedar Creek Gardens Sher˝ ood, Ore0o¸	Project No. 22-()#*	FIGURE 3

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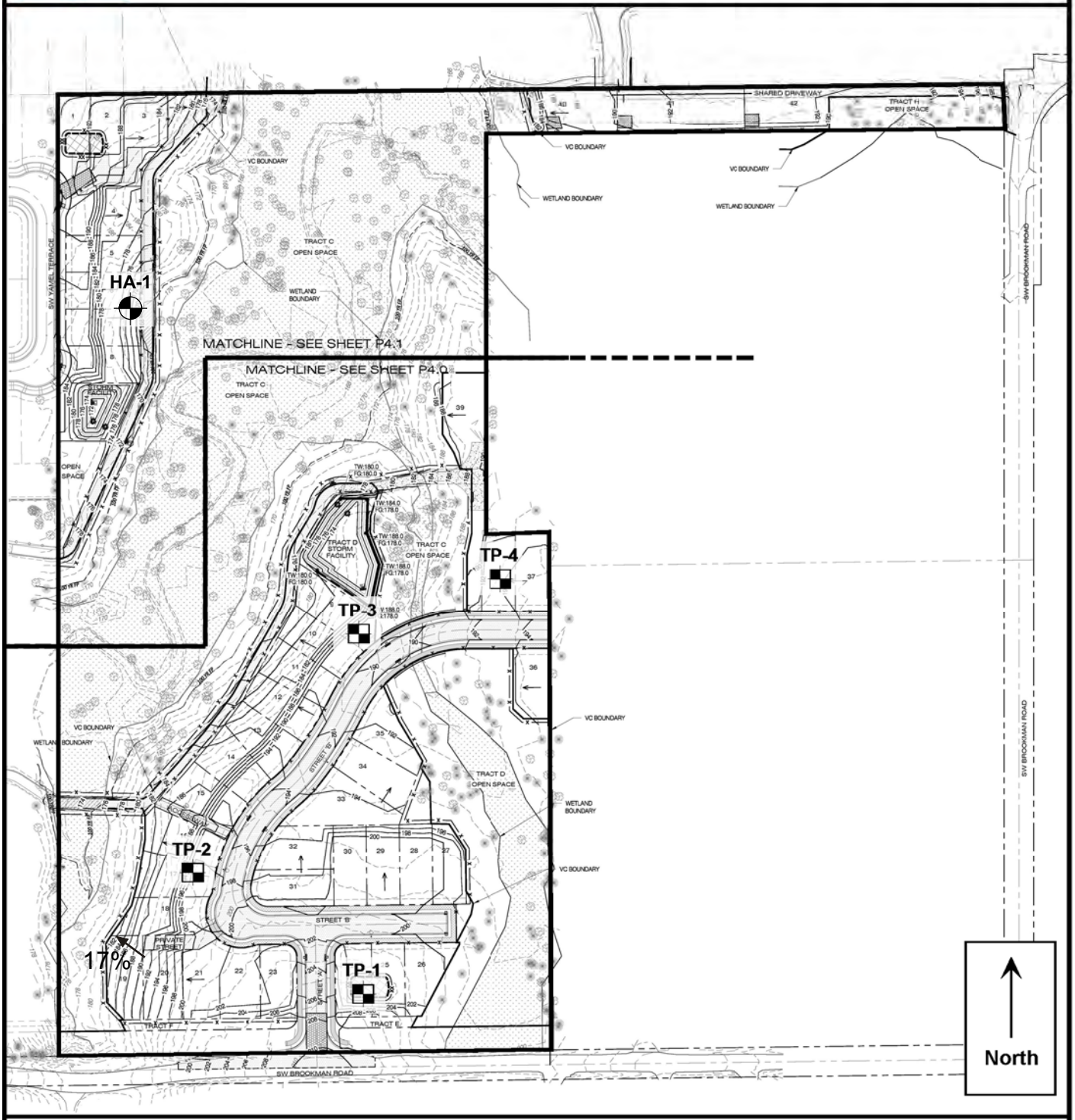
SITE GRADING PLAN AND EXPLORATION LOCATIONS



Legend

TP-1
Test Pit Designation and Approximate Location

HA-1
Hand Auger Boring Designation and Approximate Location

Date: 1/17/2022
Drawn by: EKR

0 200'
APPROXIMATE SCALE 1"=200'

Project: Cedar Creek Gardens Sherwood, Oregon	Project No. 21-5974	FIGURE 4

14835 SW 72nd A"enue
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TEST PIT LOG

Pr˝: ect: ¸ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	Test Pit No. **TP-1**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˙	˝ isture ontent (° ¸	Water earing " one	Material Description
2	9(9					˙ oderately or! anic SILT (˙) , light br˝ <n, roots throughout, loose, moist (Topsoil > ˝ ri?on)
	2(9					
&	&(5					˙ edium stiff to very stiff, clayey SILT (˙) , li! ht br˝ <n, mi$aceous, strong orange and gray mottling, trace roots to 3 feet, trace black staining, moist (Willa ette For ation
ˆ	ˆ(9					
1	&(5					
5						
6						
3						
7						
8						
29						
22						
2&						
2ˆ						
21						
25						
26						Test Pit Terminated at 16 Feet.
23						Note: No groundwater or seepage encountered.

)*+*' D

100 to 1,000 g ag Sample

5 Gal. ucket ucket Sample

Shelby Tube Sample

Seepage

˜ ater earin! Zone

˜ ater Level at Abandonment

Date Ex$avated: 1˘2ˆ˘23

)˝! ! ed By: B. Rapp

Surface Elevation:

14835 SW 72nd A"enue
Portland, Oregon 97224
Tel: (˝)'* 598-8445

TEST PIT LOG

Pr˝: ect: ˛ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˙	˝ isture ontent (° ˛	Water earing " one	Material Description
2	&(9					>i! hly or! anic (9-6 inches) to moderately or! anic (6-10 inches) SILT (˙) , dark br˝< n, roots throughout, moist (Topsoil Hori?on)
&	ˆ(9					Very stiff, clayey SILT (˙) , li! ht br˝ < n, mi$aceous, strong orange and gray ˝ ttling, trace fine roots to 3 feet, moist (Willamette Formation)
ˆ	&(9					
1	ˆ(9					
5						
6						
3						
7						
8						
29						
22						
2&						3 inch thick minerali?ed fragipan at contact
2ˆ						Stiff, SILT (ML), blue gray, micaceous, moist, (Willa ette Formation)
21						Test Pit Terminated at 13 Feet.
25						Note: No groundwater or seepage encountered.
26						
23						

)*+*' D

100 to 1,000 g ag Sample

5 Gal. ucket ucket Sample

Shelby Tube Sample

Seepage

˝ ater earin! Zone

˝ ater Level at Abandonment

Date Ex$avated: 1˘2ˆ˘23

)˝! ! ed By: B. Rapp

Surface Elevation:

14835 SW 72nd A"enue
Portland, Oregon 97224
Tel: (˝)'* 598-8445

TEST PIT LOG

Pr˝: ect: ¸ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˙)	˝˝ isture ontent (° ˙	Water earing " one	Material Description
2	&(5					)˝< or! anic SILT (˙) , dark br˝< n, roots throughout, 4 inch thick root mat, loose, moist (Topsoil >˝ ri?on)
&	1(5					Stiff to very stiff, clayey SILT (˙) , li! ht br˝ <n, mi$aceous, strong orange and ! ray mottling, roots to 3 feet, moist (Willamette Formation)
ˆ	ˆ(9					
1	ˆ(9					
5						
6						
3						
7						
8						
29						
22						
2&						˙ edium stiff to stiff, SILT (˙) , li! ht br˝ <n, mi$aceous, strong orange and gray ˝ ttling, dilatant, very m˝ ist (Willamette Formation)
2ˆ						
21						Test Pit Terminated at 13 Feet.
25						Note: No groundwater or seepage encountered.
26						
23						

)*+*' D

100 to 1,000 g ag Sample

5 Gal. ucket ucket Sample

Shelby Tube Sample

Seepage

˜ ater earin! Zone

˜ ater Level at Abandonment

Date Ex$avated: 1˘2ˆ˘23
)˝! ! ed By: B. Rapp
Surface Elevation:

14835 SW 72nd A"enue
Portland, Oregon 97224
Tel: (˝)'* 598-8445

TEST PIT LOG

Pr˝: ect: ˛ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	Test Pit No. **TP-4**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˙	˝ isture ontent (° ˛	Water earing " one	Material Description
2	2(5					˙ oderately to hi! hly or! anic (9-6 inches) to l˝< to moderately or! anic (6-20 inches) SILT (˙) , dark br˝< n, roots throughout, moist (Topsoil Hori?on)
&	ˆ(9					
ˆ	&(5					Stiff to very stiff, clayey SILT (˙) , light br˝ <n, roots to 3 feet, subtle orange and gray m˝ ttling, m˝ ist (Willa ette For ation
1	1(5					
5						
6						
3						
7						
8						
29						
22						
2&						
2ˆ						
21						Stiff, SILT (ML), blue gray, micaceous, dilatant, moist to very ˝ ist (Willamette For ation)
25						
26						Test Pit Terminated at 16 Feet.
23						Note: Groundwater seepage encountered at 8.5 feet. Discharge visually estimated at approximately ¼ gallon per minute.

)*+*' D

100 to 1,000 g ag Sample | 5 Gal. ucket ucket Sample | Shelby Tube Sample | Seepage | ˜ ater earin! Zone | ˜ ater Level at Abandonment

Date Ex$avated: 1˘2˘˘23
)˝! ! ed By: B. Rapp
Surface Elevation:

14835 SW 72nd A"enue
Portland, Oregon 97224
Tel: (˝)'* 598-8445

,! ND A. GER LOG

Pr˝: ect: ˛ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	> and Auger '˝ (,! +˘

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˙	˝ isture ontent (° ˛	Water earing " one	Material Description
2						˙ oderately to hi! hly or! anic SILT (˙) , dark br˝< n, many roots throughout, loose, moist (Topsoil > ˝ ri?on)
&						Stiff, clayey SILT (˙) , li! ht br˝ < n, mi$aceous, strong orange and gray mottlin! ; trace roots, trace black staining, moist (˜ illamette Formation)
ˆ						
1						Stiff to very stiff, SILT (˙) , trace clay, light br˝ < n, micaceous, strong orange and gray mottling, moist (Willamette Formation)
5						
6						
3						Test Pit Terminated at 6 Feet.
7						Note: No groundwater or seepage encountered.
8						
29						
22						
2&						
2ˆ						
21						
25						
26						
23						

)*+*' D

100 to 1,000 g ag Sample

5 Gal. ucket ucket Sample

Shelby Tube Sample

Seepage

˜ ater earin! Zone

˜ ater Level at Abandonment

Date Ex$avated: 1/13/22

)˝! ! ed By: B. Rapp

Surface Elevation:

Exhibit A17

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

January 24, 2022
Project No. 22-5974

Bill Wagoner & Todd Boyce
Westwood Homes, LLC.
12700 NW Cornell Road
Portland, Oregon 97229
Via email: bill@westwoodhomesllc.com; todd@westwoodhomesllc.com

CC: Matt Sprague, Pioneer Design Group: MSprague@pd-grp.com

SUBJECT: CEDAR CREEK GARDENS
16871 & 17033 SW BROOKMAN ROAD
SHERWOOD, OREGON

Reference: *Geotechnical Engineering Report, Cedar Creek Gardens, 16871 & 17033 SW Brookman Road, Sherwood, Oregon*, GeoPacific Engineering, Inc. report dated January 24, 2022.

GeoPacific Engineering, Inc. (GeoPacific) has performed a geotechnical site investigation and prepared a Geotechnical Engineering Report, the results of which are presented in the above-referenced report. The test pit exploration data used to prepare the above report was performed originally for The Holt Group; however, the property was never developed. It should be understood that The Holt Group provides no reliance or warrantees associated with the explorations.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

Beth K. Rapp, C.E.G.
Senior Engineering Geologist

James D. Imbrie, P.E.
Principal Geotechnical Engineer

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

January 24, 2022
Project No. 22-5974

Bill Wagoner & Todd Boyce
Westwood Homes, LLC.
12700 NW Cornell Road
Portland, Oregon 97229
Via email: bill@westwoodhomesllc.com; todd@westwoodhomesllc.com

CC: Matt Sprague, Pioneer Design Group: MSprague@pd-grp.com

SUBJECT: GEOTECHNICAL ENGINEERING REPORT
CEDAR CREEK GARDENS
16871 & 17033 SW BROOKMAN ROAD
SHERWOOD, OREGON

Reference: *Clean Water Services Slope Setbacks, Cedar Creek Gardens, 16871 & 17033 SW Brookman Road, Sherwood, Oregon*, GeoPacific Engineering, Inc. letter report dated January 17, 2022.

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our investigation was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-7982, dated January 10, 2022, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The subject site located on the north side of SW Brookman Road in the City of Sherwood, Washington County, Oregon (Figure 1). The property is comprised of two tax lots totaling approximately 20 acres in size. Topography is gently to moderately sloping towards Cedar Creek, which diagonally bisects the site (Figures 2 through 4). Slopes range from less than 5 percent to up to 30 percent adjacent to the creek. Wetland areas have been delineated by others. Vegetation consists primarily of short grasses and sparse trees. The site is currently occupied by two homes and one outbuilding.

It is our understanding that approximately 8 acres of the site is available for development. The proposed development will consist of a ±42 lot subdivision for single family homes, new streets, stormwater disposal facilities, and associated underground utilities (Figure 4). The grading plan

provided for our review indicates maximum cuts will be up to 14 feet and fills will be on the order of approximately 5 feet or less.

REGIONAL AND LOCAL GEOLOGIC SETTING

The project site is located to the southwest of the Portland West Hills, in the northwest portion of the Tualatin Basin. The Tualatin Basin is an east/west trending structural feature produced by broad regional down warping of the area. Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The site is underlain by the Quaternary age (last 1.6 million years) Willamette Formation, a catastrophic flood deposit associated with repeated glacial outburst flooding of the Willamette Valley (Yeats et al., 1996). The last of these outburst floods occurred about 10,000 years ago. These deposits typically consist of horizontally layered, micaceous, silt to coarse sand forming poorly-defined to distinct beds less than 3 feet thick. Regional studies indicate that the thickness of the Willamette Formation in the vicinity of the subject site is approximately 30 feet (Madin, 1990).

Regional geologic mapping indicates the Willamette Formation is underlain by the Columbia River Basalt Formation (Madin, 1990; Gannett and Caldwell, 1998). The Miocene aged (about 14.5 to 16.5 million years ago) Columbia River Basalts are a thick sequence of lava flows which form the crystalline basement of the Tualatin Valley. The basalts are composed of dense, finely crystalline rock that is commonly fractured along blocky and columnar vertical joints. Individual basalt flow units typically range from 25 to 125 feet thick and interflow zones are typically vesicular, scoriaceous, brecciated, and sometimes include sedimentary rocks.

REGIONAL SEISMIC SETTING

At least three major fault zones capable of generating damaging earthquakes are thought to exist in the vicinity of the subject site. These include the Portland Hills Fault Zone, the Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone.

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills and is approximately 12.9 miles northeast of the site. The East Bank Fault occurs along the eastern margin of the Willamette River and is located approximately 15.8 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills and is approximately 10.9 miles northeast of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although

there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

Gales Creek-Newberg-Mt. Angel Structural Zone

The Gales Creek-Newberg-Mt. Angel Structural Zone is a 50-mile-long zone of discontinuous, NW-trending faults that lies approximately 6.5 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A geologic reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek Fault or Newberg Fault (the fault closest to the subject site); however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies roughly along the Oregon Coast at depths of 20 and 40 kilometers below the ocean surface.

FIELD EXPLORATION

Our site-specific exploration for this report was conducted on April 13, 2017 and January 13, 2022. Four exploratory test pits, designated TP-1 through TP-4, were excavated with a medium sized trackhoe to depths ranging between 13 and 16 feet and one exploratory hand auger boring was advanced to a depth of 6 feet at the approximate locations presented on Figure 4. It should be noted that exploration locations were located in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate.

A GeoPacific Engineering Geologist continuously monitored the field exploration program and logged the explorations. Soils observed in the explorations were classified in general accordance with the Unified Soil Classification System (USCS). During exploration, our geologist also noted geotechnical conditions such as soil consistency, moisture and groundwater conditions. Logs of the explorations are attached to this report. The following report sections are based on the exploration program and summarize subsurface conditions encountered at the site.

SUBSURFACE CONDITIONS

Results of the field exploration program indicate the site is underlain by a topsoil horizon and Willamette Formation soils. The observed soil and groundwater conditions are summarized below.

Undocumented Fill: Undocumented fill was not encountered in the explorations performed for this study. It is possible that areas of fill may be present outside our explorations – especially in the vicinity of the existing structures and driveways.

Topsoil Horizon: Directly underlying the ground surface in test pits TP-1 through TP-4 and hand auger boring HA-1 was a topsoil horizon consisting of brown, low to highly organic silt (OL-ML) with fine roots throughout. The topsoil horizon was generally loose and characterized by a soft to medium stiff consistency. In explorations, the topsoil material was approximately 9 to 18 inches in thickness.

Willamette Formation: Underlying the topsoil horizon in explorations were soils belonging to the Willamette Formation. These soils generally consisted of micaceous, light brown, clayey silt (ML) to silt with trace clay that displayed subtle orange and gray mottling. The silt was generally medium stiff to very stiff with field pocket penetrometer measurements from the upper four feet of soil indicating the Willamette Formation soils have an approximate unconfined compressive strength of 1.0 to 3.0 tons/ft^2. In test pits TP-2 through TP-4, the silt with clay transitioned to silt below a depth of 11 to 14 feet. In explorations, soils belonging to the Willamette Formation extended beyond the maximum depth of exploration (6 to 16 feet).

Groundwater

On April 13, 2017 and January 13, 2022 soils encountered in explorations were generally moist to very moist with wet zones where perched groundwater seepage was observed. Minor perched groundwater seepage was encountered in test pit TP-4 at a depth of 8.5 feet. Discharge was visually estimated at ¼ gallon per minute. Our review of Water Well logs from nearby properties indicates static groundwater is present at a depth of greater than 50 feet (Oregon Water Resources Department, 2022). It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. Experience has shown that temporary perched groundwater conditions often occur over fine-grained native deposits such as those beneath the site, particularly during the wet season. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors.

CONCLUSIONS AND RECOMMENDATIONS

Our investigation indicates that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. The primary geotechnical constraints to development include:

1) Medium stiff, near surface soils and perched groundwater conditions. These conditions paired with dilatant soils at depth could make deep cuts and utility trenching difficult, especially in the wet weather months, and adequate shoring should be maintained.

2) Medium stiff, near surface soils. Additional depths of excavation for subgrade preparation and foundations may be required in areas.

3) The potential for soil settlement – both static and dynamic conditions. Engineered fill should be limited to 5 feet. If additional fill depths are planned, additional analysis may be necessary to determine the magnitude of settlement and to evaluate liquefaction hazard.

Slope Stability and CWS Slope Setbacks

Clean Water Services (CWS) allows a reduction of the 35-foot setback from the break in slope to 15 feet with a geotechnical engineer's review. GeoPacific's evaluation of the slope stability setback was based on a geologic reconnaissance, review of site specific topographic survey and published geologic mapping, and subsurface explorations consisting of four test pits and one hand auger boring. Visual criterion considered by the geologist when evaluating slope stability included topographic grade and smoothness or regularity; degree of creep; age, density, condition and degree on deformity of native trees; and evidence of erosion and past fill placement.

Our reconnaissance of the moderately to steeply sloping portion of the site (immediately adjacent to Cedar Creek and the unnamed tributary drainage to Cedar Creek) indicates slopes are generally smooth and uniform (Figures 2 & 4) which is consistent with stable conditions. No landslides are mapped on the site by the Oregon Department of Geology and Mineral Industries, as presented on Figure 2 (DOGAMI Slido, 2022). Explorations indicate that the slopes adjacent to the Cedar Creek drainages are underlain by stiff to medium stiff to very stiff, clayey silt (ML) to silt (ML) with clay underlain by medium stiff to stiff, silt (ML). These materials are considered moderately resistant to slope stability on moderately sloping topography. No springs or seeps were observed. Based on our reconnaissance, shallow subsurface explorations, and information available at present, a 15 foot offset from the break in slope is adequate to maintain slope stability along the vegetated corridor for residential development.

Site Preparation

Areas of proposed buildings, streets, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris. Existing drain tiles and buried structures such as septic tanks, should be demolished and any cavities structurally backfilled. Areas of undocumented fill should be completely removed to native soils. Although undocumented fill was not encountered during our explorations, areas of fill may be present in the vicinity of the existing structures and driveways. Inorganic debris should be removed from the site.

Organic-rich topsoil should then be stripped from native soil areas of the site. The estimated depth range necessary for removal of topsoil in cut and fill areas is approximately 6 to 9 inches, respectively. Deeper removals may be necessary in highly treed areas of the site. The final depth of soil removal will be determined on the basis of a site inspection after the stripping/excavation has been performed. Stripped topsoil should preferably be removed from the site due to the high density of the proposed development. Any remaining topsoil should be stockpiled only in designated areas and stripping operations should be observed and documented by the geotechnical engineer or his representative.

Once topsoil stripping and removal of organic and inorganic debris are approved in a particular area, the area must be ripped or tilled to a depth of 12 inches, moisture conditioned, root-picked, and compacted in-place prior to the placement of engineered fill or crushed aggregate base for pavement. Exposed subgrade soils should be evaluated by the geotechnical engineer. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, the subgrade should

be evaluated by probing the soil with a steel probe. Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition, over-excavated and replaced with engineered fill (as described below) or stabilized with rock prior to placement of engineered fill. The depth of overexcavation, if required, should be evaluated by the geotechnical engineer at the time of construction.

Excavating Conditions and Utility Trenches

We anticipate that on-site soils can be excavated using conventional heavy equipment such as trackhoes to a depth of 16 feet. Soft to medium stiff, near surface soils and perched groundwater conditions caused sidewall caving or dilatant conditions in several test pits. These conditions could make utility trenching and deep excavations difficult, especially in the winter months, and adequate shoring should be maintained.

All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926) or be shored. The existing, near surface, native soils classify as Type B Soil and shallow, temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. Type C Soils may be encountered at depth. This cut slope inclination is applicable to excavations above the water table only. Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. Actual slope inclinations at the time of construction should be determined based on safety requirements and actual soil and groundwater conditions.

Saturated soils and groundwater may be encountered in utility trenches, particularly during the wet season. We anticipate that dewatering systems consisting of ditches, sumps and pumps would be adequate for control of perched groundwater. Regardless of the dewatering system used, it should be installed and operated such that in-place soils are prevented from being removed along with the groundwater. Trench bottom stabilization, such as one to two feet of compacted crushed aggregate base, may be necessary in deeper trenches.

Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

PVC pipe should be installed in accordance with the procedures specified in ASTM D2321. We recommend that trench backfill be compacted to at least 95% of the maximum dry density obtained by Standard Proctor ASTM D698 or equivalent. Initial backfill lift thickness for a ¾”-0 crushed aggregate base may need to be as great as 4 feet to reduce the risk of flattening underlying flexible pipe. Subsequent lift thickness should not exceed 1 foot. If imported granular fill material is used, then the lifts for large vibrating plate-compaction equipment (e.g. hoe compactor attachments) may be up to 2 feet, provided that proper compaction is being achieved and each lift is tested. Use of large vibrating compaction equipment should be carefully monitored near existing structures and improvements due to the potential for vibration-induced damage.

Adequate density testing should be performed during construction to verify that the recommended relative compaction is achieved. Typically, one density test is taken for every 4 vertical feet of backfill on each 200-lineal-foot section of trench.

Engineered Fill

In general, we anticipate that soils from planned cuts and utility trench excavations will be suitable for use as engineered fill provided they are adequately moisture conditioned prior to compacting. Imported fill material should be reviewed by GeoPacific prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 95 percent of the maximum dry density determined by ASTM D698 (Standard Proctor) or 90 percent of modified Proctor for HUD requirements. On-site soils may be wet or dry of optimum; therefore, we anticipate that moisture conditioning of native soil will be necessary for compaction operations.

Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Field density testing should generally conform to ASTM D2922 and D3017, or D1556. Engineered fill should be periodically observed and tested by the project geotechnical engineer or his representative. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 cubic yards, whichever requires more testing. Because testing is performed on an on-call basis, we recommend that the earthwork contractor be held contractually responsible for test scheduling and frequency.

Wet Weather Earthwork

Soils underlying the site are likely to be moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will probably require expensive measures such as cement treatment or imported granular material to compact fill to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent fines. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;

- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Geotextile silt fences, straw wattles, and fiber rolls should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, GeoPacific should be contacted to provide additional recommendations and field monitoring.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion except in areas of steeply sloping topography adjacent to the Cedar Creek drainage and tributary drainage. In our opinion, the primary concern regarding erosion potential will occur during construction, in areas that have been stripped of vegetation, especially in moderately sloping areas. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw waddles and silt fences. If used, these erosion control devices should be in place and remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

Spread Foundations

The proposed residential structures may be supported on shallow foundations bearing on competent undisturbed, native soils and/or engineered fill, appropriately designed and constructed as recommended in this report. Foundation design, construction, and setback requirements should conform to the applicable building code at the time of construction. GeoPacific should review the foundation excavation to verify exposed soil conditions prior to pouring footings. For maximization of bearing strength and protection against frost heave, spread footings should be embedded at a minimum depth of 12 inches below exterior grade except where footing-to-slope setbacks require deeper embedments. The recommended minimum widths for continuous footings supporting wood-framed walls without masonry are 12 inches for single-story, 15 inches for two-story, and 18 inches for three-story structures. Minimum foundation reinforcement should consist of a No. 4 bar at the top of stem walls, and a No. 4 bar at the bottom of the footings. Concrete slab-on-grade reinforcement should consist of No. 4 bars placed on 24-inch centers in a grid pattern.

The anticipated allowable soil bearing pressure is 1,500 lbs/ft^2 for footings bearing on competent, native soil and/or engineered fill. A maximum chimney and column load of 30 kips is recommended for the site. The recommended maximum allowable bearing pressure may be increased by 1/3 for short-term transient conditions such as wind and seismic loading. For heavier loads, the geotechnical engineer should be consulted. The coefficient of friction between on-site soil and poured-in-place concrete may be taken as 0.42, which includes no factor of safety. The maximum anticipated total and differential footing movements (generally from soil expansion and/or settlement) are 1 inch and ¾ inch over a span of 20 feet, respectively. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied.

Excavations near structural footings should not extend within a 1H:1V plane projected downward from the bottom edge of footings.

Footing excavations should penetrate through topsoil and any loose soil to competent subgrade that is suitable for bearing support. All footing excavations should be trimmed neat, and all loose or softened soil should be removed from the excavation bottom prior to placing reinforcing steel bars. Due to the moisture sensitivity of on-site native soils, foundations constructed during the wet weather season may require overexcavation of footings and backfill with compacted, crushed aggregate.

Our recommendations are for house construction incorporating raised wood floors and conventional spread footing foundations. If living space of the structures will incorporate basements, a geotechnical engineer should be consulted to make additional recommendations for retaining walls, water-proofing, underslab drainage and wall subdrains. After site development, a Final Soil Engineer's Report should either confirm or modify the above recommendations.

Concrete Slabs-on-Grade

Preparation of areas beneath concrete slab-on-grade floors should be performed as recommended in the *Site Preparation* section. Care should be taken during excavation for foundations and floor slabs, to avoid disturbing subgrade soils. If subgrade soils have been adversely impacted by wet weather or otherwise disturbed, the surficial soils should be scarified to a minimum depth of 8 inches, moisture conditioned to within about 3 percent of optimum moisture content, and compacted to engineered fill specifications. Alternatively, disturbed soils may be removed and the removal zone backfilled with additional crushed rock.

For evaluation of the concrete slab-on-grade floors using the beam on elastic foundation method, a modulus of subgrade reaction of 150 kcf (87 pci) should be assumed for the medium stiff native silt soils anticipated at subgrade depth. This value assumes the concrete slab system is designed and constructed as recommended herein, with a minimum thickness of crushed rock of 8 inches beneath the slab.

Interior slab-on-grade floors should be provided with an adequate moisture break. The capillary break material should consist of ODOT open graded aggregate per ODOT Standard Specifications 02630-2. The minimum recommended thickness of capillary break materials on re-compacted soil subgrade is 8 inches. The total thickness of crushed aggregate will be dependent on the subgrade conditions at the time of construction, and should be verified visually by proof-rolling. Under-slab aggregate should be compacted to at least 90% of its maximum dry density as determined by ASTM D1557 or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structure, appropriate vapor barrier and damp-proofing measures should be implemented. A commonly applied vapor barrier system consists of a 10-mil polyethylene vapor barrier placed directly over the capillary break material. Other damp/vapor barrier systems may also be feasible. Appropriate design professionals should be consulted regarding vapor barrier and damp proofing systems, ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Permanent Below-Grade Walls

Lateral earth pressures against below-grade retaining walls will depend upon the inclination of any adjacent slopes, type of backfill, degree of wall restraint, method of backfill placement, degree of backfill compaction, drainage provisions, and magnitude and location of any adjacent surcharge loads. At-rest soil pressure is exerted on a retaining wall when it is restrained against rotation. In contrast, active soil pressure will be exerted on a wall if its top is allowed to rotate or yield a distance of roughly 0.001 times its height or greater.

If the subject retaining walls will be free to rotate at the top, they should be designed for an active earth pressure equivalent to that generated by a fluid weighing 35 pcf for level backfill against the wall. For restrained wall, an at-rest equivalent fluid pressure of 55 pcf should be used in design, again assuming level backfill against the wall. These values assume that drainage provisions are incorporated, free draining gravel backfill is used, and hydrostatic pressures are not allowed to develop against the wall.

During a seismic event, lateral earth pressures acting on below-grade structural walls will increase by an incremental amount that corresponds to the earthquake loading. Based on the Mononobe-Okabe equation and peak horizontal accelerations appropriate for the site location, seismic loading should be modeled using the active or at-rest earth pressures recommended above, plus an incremental rectangular-shaped seismic load of magnitude 6.5H, where H is the total height of the wall.

We assume relatively level ground surface below the base of the walls. As such, we recommend passive earth pressure of 320 pcf for use in design, assuming wall footings are cast against competent native soils or engineered fill. If the ground surface slopes down and away from the base of any of the walls, a lower passive earth pressure should be used and GeoPacific should be contacted for additional recommendations.

A coefficient of friction of 0.42 may be assumed along the interface between the base of the wall footing and subgrade soils. The recommended coefficient of friction and passive earth pressure values do not include a safety factor, and an appropriate safety factor should be included in design. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

The above recommendations for lateral earth pressures assume that the backfill behind the subsurface walls will consist of properly compacted structural fill, and no adjacent surcharge loading. If the walls will be subjected to the influence of surcharge loading within a horizontal distance equal to or less than the height of the wall, the walls should be designed for the additional horizontal pressure. For uniform surcharge pressures, a uniformly distributed lateral pressure of 0.3 times the surcharge pressure should be added. Traffic surcharges may be estimated using an additional vertical load of 250 psf (2 feet of additional fill), in accordance with local practice.

The recommended equivalent fluid densities assume a free-draining condition behind the walls so that hydrostatic pressures do not build-up. This can be accomplished by placing a 12 to 18-inch wide zone of sand and gravel containing less than 5 percent passing the No. 200 sieve against the walls. A 3-inch minimum diameter perforated, plastic drain pipe should be installed at the base of the walls and connected to a suitable discharge point to remove water in this zone of sand and gravel. The drain pipe should be wrapped in filter fabric (Mirafi 140N or other as approved by the geotechnical engineer) to minimize clogging.

Wall drains are recommended to prevent detrimental effects of surface water runoff on foundations – not to dewater groundwater. Drains should not be expected to eliminate all potential sources of water entering a basement or beneath a slab-on-grade. An adequate grade to a low point outlet drain in the crawlspace is required by code. Underslab drains are sometimes added beneath the slab when placed over soils of low permeability and shallow, perched groundwater.

Water collected from the wall drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Down spouts and roof drains should not be connected to the wall drains in order to reduce the potential for clogging. The drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building.

GeoPacific should be contacted during construction to verify subgrade strength in wall keyway excavations, to verify that backslope soils are in accordance with our assumptions, and to take density tests on the wall backfill materials.

Structures should be located a horizontal distance of at least 1.5H away from the back of the retaining wall, where H is the total height of the wall. GeoPacific should be contacted for additional foundation recommendations where structures are located closer than 1.5H to the top of any wall.

ROADWAY SECTION DESIGNS

As part of our investigation, GeoPacific has prepared roadway section recommendations for the interior public streets to be constructed as part of the Cedar Creek Gardens development. We understand that the new roadways, currently named Street A and Street B, will be public local streets primarily providing access to new homes within the subdivision.

Traffic and ESAL Calculation

For the new development of Cedar Creek Gardens, we estimated an average daily traffic (ADT) of 310 trips per day based on the number of new homes planned for construction in the current proposed development. The anticipated traffic for Cedar Creek Gardens, will primarily consist of light duty passenger vehicles, weekly trash and recycling pickups, delivery vehicles and occasional fire trucks, weighing up to 75,000 pounds.

We calculated 18-kip ESAL (Equivalent Single Axle Load) count and necessary structural numbers using the ESAL Annual Conversion Factors for flexible pavement applications and methodology described in the ODOT Pavement Design Guide. Our calculated ESAL count, and inputs required to calculate the Minimum Required Structural Number needed to support the anticipated traffic of a 20-year design life are presented in Table 1. The roadbed soil resilient modulus was conservatively estimated based on pocket penetrometer readings within our test pit explorations.

Table 1: Roadway Section Design Input Factors for Street A & B with Design Life of 20-years

Input Parameter	Design Value
18-kip ESAL Initial Performance Period (20 Years)	66,888
Initial Serviceability	4.2
Terminal Serviceability	2.5
Reliability Level	85 Percent
Overall Standard Deviation	0.5
Roadbed Soil Resilient Modulus (PSI)	4,000
Minimum Required Structural Number	**2.76**

Our calculated ESAL and the additional inputs required to calculate the Minimum Required Structural Number to support the anticipated traffic of a 20-year design life for Street A & B are presented in Table 2.

Roadway Section Design – Streets A & B

Our recommended new roadway section was designed to support the anticipated traffic of a 20-year design life. Table 2 presents our minimum dry-weather roadway section recommendations for Street A & B with estimated structural coefficients calculated into a structural number, assuming the ESAL value and input parameters displayed in Table 1. Design calculations are attached to this report.

Table 2 – Minimum Dry-Weather Roadway Section for Street A & B

Material Layer	Section Thickness (in.)	Structural Coefficient	Compaction Standard
New Dense ACP	4	0.42	91% Base / 92% Top of Density per AASHTO T-209
¾''-0 Crushed Aggregate Levelling Course	2	0.10	95% of Modified Proctor AASHTO T-180
1.5''-0 Crushed Aggregate Base Course	10	0.10	95% of Modified Proctor AASHTO T-180
Subgrade		4,000 PSI	Approved Subgrade
New Section Structural Number – 2.88			
Minimum Required Structural Number – 2.76			

Subgrade preparation and wet weather construction recommendations are presented in subsequent sections of this report.

Subgrade Preparation

Roadway subgrade soils and/or sub-base should be graded, moisture conditioned, compacted and inspected by GeoPacific prior to the placement of crushed aggregate base for pavement. Typically, a proof roll with a fully loaded water or haul truck is conducted by travelling slowly across the grade and observing the subgrade for rutting, deflection, or movement. Any pockets of organic debris or

loose fill encountered during ripping or tilling should be removed and replaced with engineered fill. To verify subgrade strength, we recommend proof-rolling directly on subgrade with a loaded dump truck during dry weather and on top of base course in wet weather. Soft areas that pump, rut, or weave should be stabilized prior to paving.

If roadway areas are to be constructed during wet weather, the subgrade and construction plan should be reviewed by the project geotechnical engineer at the time of construction so that condition specific recommendations can be provided. The subgrade soils observed in our subsurface exploration, though not necessarily susceptible to erosion, may become slick and difficult to work with in wet weather conditions. General recommendations for wet weather roadway sections are provided below.

During placement of pavement section materials, density testing should be performed to verify compliance with project specifications. Generally, one subgrade, one base course, and one asphalt compaction test are performed for every 100 to 200 linear feet of paving. Roadway fill and base aggregate material should be compacted to 95 percent of a Modified Proctor (ASSHTO T-180). ACP should be compacted to 91 percent of the theoretical maximum density as determined by ASSHTO T-209 for base lifts and 92 percent for top lifts.

Wet Weather Roadway Construction

This segment presents our recommendations for wet weather roadway construction for new roadway sections at the project. These wet weather roadway section recommendations are intended for use in situations where it is not feasible to compact the subgrade soils, due to wet subgrade soil conditions, and/or construction during wet weather.

Based on our site review, we recommend a wet weather section with a minimum subgrade deepening of 6-inches to accommodate a working subbase of additional 1½”-0 crushed rock. Geotextile fabric, Mirafi 500x or equivalent, should be placed on subgrade soils prior to placement of base rock.

In some instances, it may be preferable to use Special Treated Base (STB) in combination with over-excavation and increasing the thickness of the rock section. GeoPacific should be consulted for additional recommendations regarding use of STB in wet weather roadway sections if it is desired to pursue this alternative. Cement treatment of the subgrade may also be considered instead of over-excavation. For planning purposes, we anticipate that treatment of the onsite soils would involve mixing cement powder to approximately 6 percent cement content and a mixing depth on the order of 12 to 18 inches.

With implementation of the above recommendations, it is our opinion that the resulting roadway section will provide equivalent or greater structural strength than the dry weather roadway section currently planned. However, it should be noted that construction in wet weather is risky and the performance of pavement subgrades depend on a number of factors including the weather conditions, the contractor’s methods, and the amount of traffic the road is subjected to. There is a potential that soft spots may develop even with implementation of the wet weather provisions recommended in this letter. If soft spots in the subgrade are identified during roadway excavation, or develop prior to paving, the soft spots should be over-excavated and backfilled with additional crushed rock.

During subgrade excavation, care should be taken to avoid disturbing the subgrade soils. Removals should be performed using an excavator with a smooth-bladed bucket. Truck traffic should be limited until an adequate working surface has been established. We suggest that the

crushed rock be spread using bulldozer equipment rather than dump trucks, to reduce the amount of traffic and potential disturbance of subgrade soils.

Care should be taken to avoid over-compaction of the base course materials, which could create pumping, unstable subgrade soil conditions. Heavy and/or vibratory compaction efforts should be applied with caution. Following placement and compaction of the crushed rock to project specifications (95 percent of Modified Proctor), a finish proof-roll should be performed before paving.

The above recommendations are subject to field verification. GeoPacific should be on-site during construction to verify subgrade strength and to take density tests on the engineered fill, base rock and asphaltic pavement materials.

Seismic Design

The Oregon Department of Geology and Mineral Industries (DOGAMI), Oregon HazVu: 2022 Statewide GeoHazards Viewer indicates that the site is in an area where *severe* ground shaking is anticipated during an earthquake. Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2018 International Building Code (IBC) with applicable Oregon Structural Specialty Code (OSSC) revisions (current 2019). We recommend Site Class D be used for design as defined in ASCE 7-16, Chapter 20, and Table 20.3-1. Design values determined for the site using the Applied Technology Council (ATC) 2019 Hazards By Location Online Tool are summarized in Table 3 and are based upon existing soil conditions.

Table 3. Recommended Earthquake Ground Motion Parameters (ASCE 7-16)

Parameter	Value
Location (Lat, Long), degrees	45.345, -122.850
Probabilistic Ground Motion Values, 2% Probability of Exceedance in 50 years	
Peak Ground Acceleration PGA_M	0.464
Short Period, S_s	0.831 g
1.0 Sec Period, S_1	0.394 g
Soil Factors for Site Class D:	
F_a	1.168
F_v	*1.906
$SD_s = 2/3 \times F_a \times S_s$	0.647 g
Residential Seismic Design Category	D

* F_v value reported in the above table is a straight-line interpolation of mapped spectral response acceleration at 1-second period, S_1 per Table 1613.2.3(2) with the assumption that Exception 2 of ASCE 7-16 Chapter 11.4.8 is met per the Structural Engineer. If Exception 2 is not met, GeoPacific Engineering can be consulted to provide a site specific spectral analysis.

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. According to the Oregon HazVu: Statewide Geohazards Viewer, the majority of the subject site is regionally characterized as having a low risk

of soil liquefaction with areas of high risk mapped immediately adjacent to the Cedar Creek drainage and tributary drainage, as presented on Figure 3 (DOGAMI:HazVu, 2022).

For construction of single family structures, special design or construction measures are not required by code to mitigate the effects of liquefaction. GeoPacific can provide a liquefaction analysis addressing the potential adverse effects due to liquefaction, such as vertical settlement, lateral deformation, and lateral spreading if multifamily or commercial structures are planned for the Cedar Creek Gardens development.

Footing and Roof Drains

Construction should include typical measures for controlling subsurface water beneath the homes, including positive crawlspace drainage to an adequate low-point drain exiting the foundation, visqueen covering the expose ground in the crawlspace, and crawlspace ventilation (foundation vents). The homebuyers should be informed and educated that some slow flowing water in the crawlspaces is considered normal and not necessarily detrimental to the home given these other design elements incorporated into its construction. Appropriate design professionals should be consulting regarding crawlspace ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Down spouts and roof drains should collect roof water in a system separate from the footing drains to reduce the potential for clogging. Roof drain water should be directed to an appropriate discharge point and storm system well away from structural foundations. Grades should be sloped downward and away from buildings to reduce the potential for ponded water near structures.

If the proposed structures will have a raised floor, and no concrete slab-on-grade floors in living spaces are used, perimeter footing drains would not be required based on soil conditions encountered at the site and experience with standard local construction practices. Where it is desired to reduce the potential for moist crawl spaces, footing drains may be installed. If concrete slab-on-grade floors are used, perimeter footing drains should be installed as recommended below.

Where necessary, perimeter footing drains should consist of 3 or 4-inch diameter, perforated plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, free-draining drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. In our opinion, footing drains may outlet at the curb, or on the back sides of lots where sufficient fall is not available to allow drainage to meet the street.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

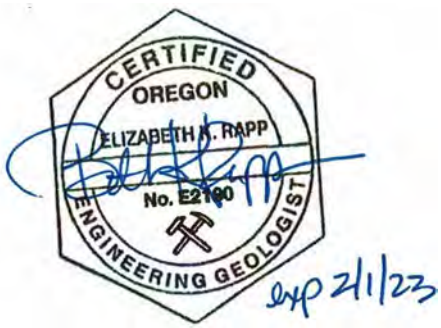
Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. The checklist attached to this report outlines recommended geotechnical observations and testing for the project. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.



Beth K. Rapp, C.E.G.
Senior Engineering Geologist

James D. Imbrie, G.E., C.E.G.
Principal Geotechnical Engineer

Attachments: References
Figure 1 - Vicinity Map
Figure 2 - Lidar Based Vicinity Map - with Mapped Landslides
Figure 3 - Lidar Based Vicinity Map - with Liquefaction Hazard
Figure 4 - Site Grading Plan and Exploration Locations
Test Pit Logs (TP-1 through TP-4)
Hand Auger Logs (HA-1)
Pavement Design (1 page)

REFERENCES

Applied Technology Council (ATC), 2022, Hazards by Location Online Tool, https://hazards.atcouncil.org/#/seismic

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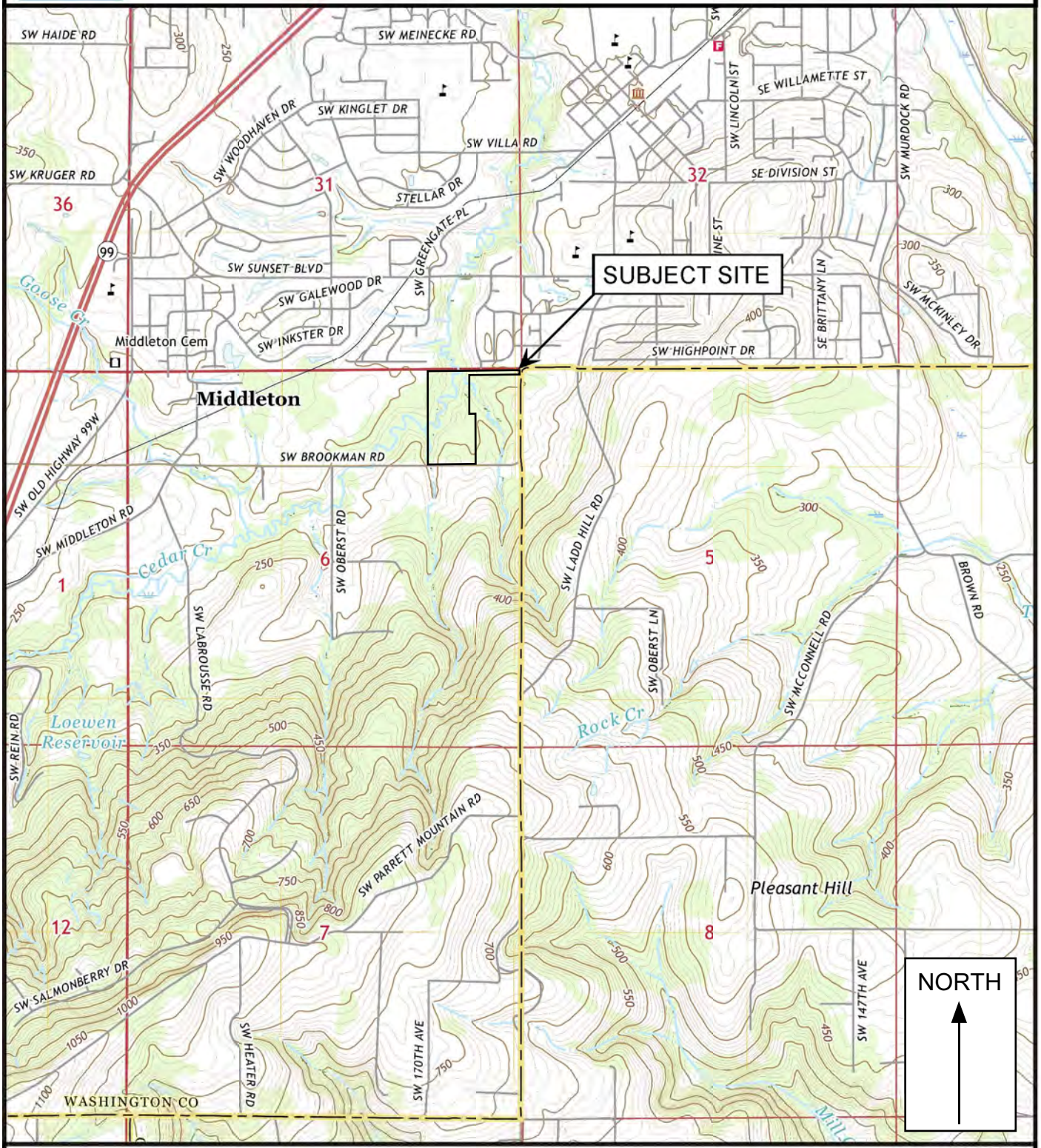
CHECKLIST OF RECOMMENDED GEOTECHNICAL TESTING AND OBSERVATION

Item No.	Procedure	Timing	By Whom	Done
1	Preconstruction meeting	Prior to beginning site work	Contractor, Developer, Civil and Geotechnical Engineers	
2	Fill removal from site or sorting and stockpiling	Prior to mass stripping	Soil Technician/ Geotechnical Engineer	
3	Stripping, aeration, and root-picking operations	During stripping	Soil Technician	
4	Compaction testing of engineered fill (95% of Standard Proctor)	During filling, tested every 2 vertical feet	Soil Technician	
5	Compaction testing of trench backfill (95% of Standard Proctor)	During backfilling, tested every 4 vertical feet for every 200 lineal feet	Soil Technician	
6	Street Subgrade Inspection	Prior to placing base course	Soil Technician	
7	Base course compaction (95% of Modified Proctor)	Prior to paving, tested every 200 lineal feet	Soil Technician	
8	Footing Excavation	During Excavation	Soil Technician	
9	Final Geotechnical Engineer's Report	Completion of project	Geotechnical Engineer	

GEOPACIFIC
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445

VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 feet

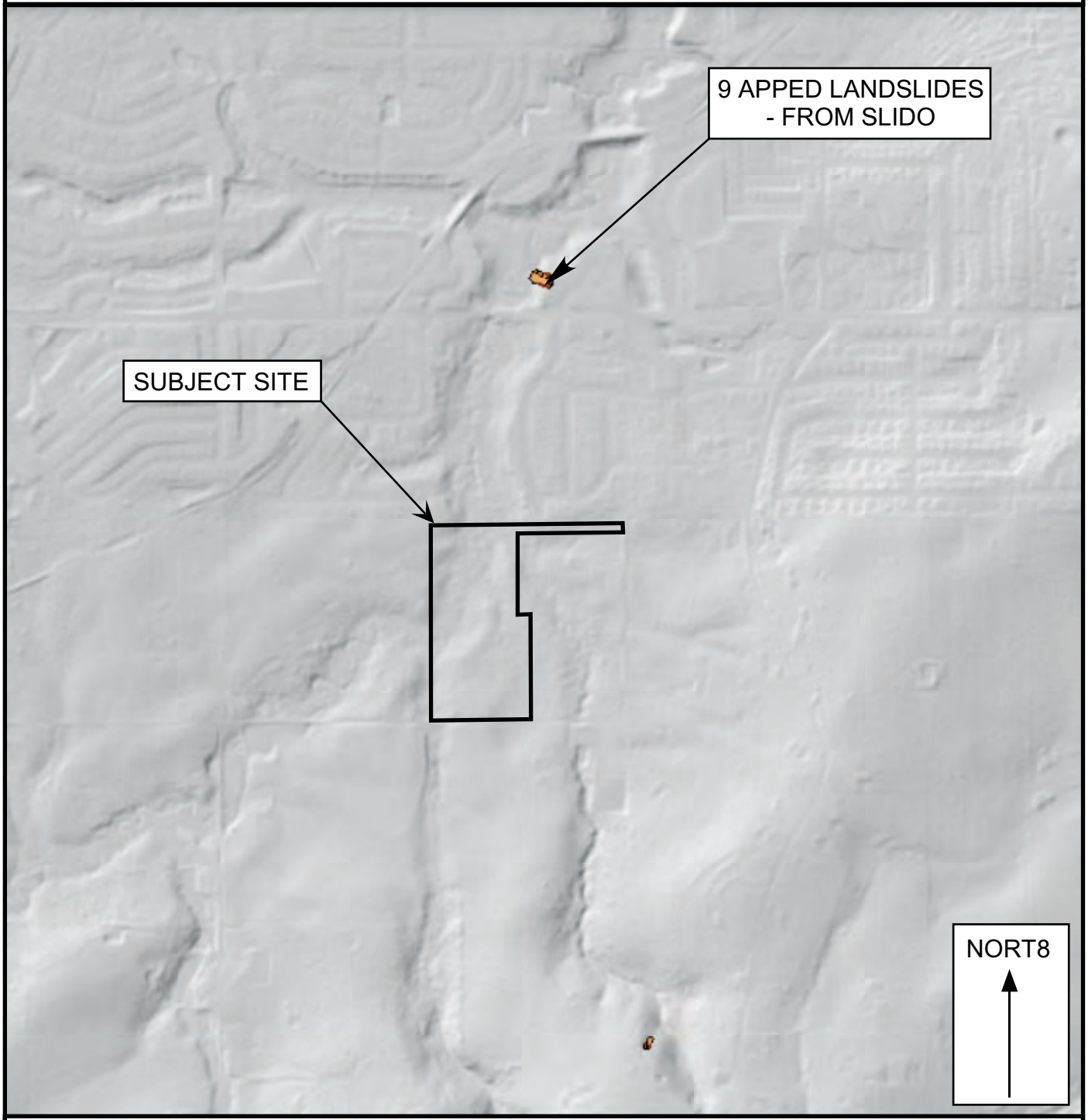
Date: 1/24/2022
Drawn by: EKR

Base map: U.S. Geological Survey 7.5 minute Topographic Map Series, Sherwood, Oregon Quadrangle, 2020.

Project: Cedar Creek Gardens Sherwood, Oregon	Project No. 22-5974	FIGURE 1

14835 SW 72n¸ A°˜˝ e
Portland, Oregon 97224
T˜ l: (˘,˘- 598-8445

LIDAR BASED VICINITY MAP - WITH MAPPED LANDSLIDES



Legend

Approx˜ ate Scale 1 in = 1,000 ft

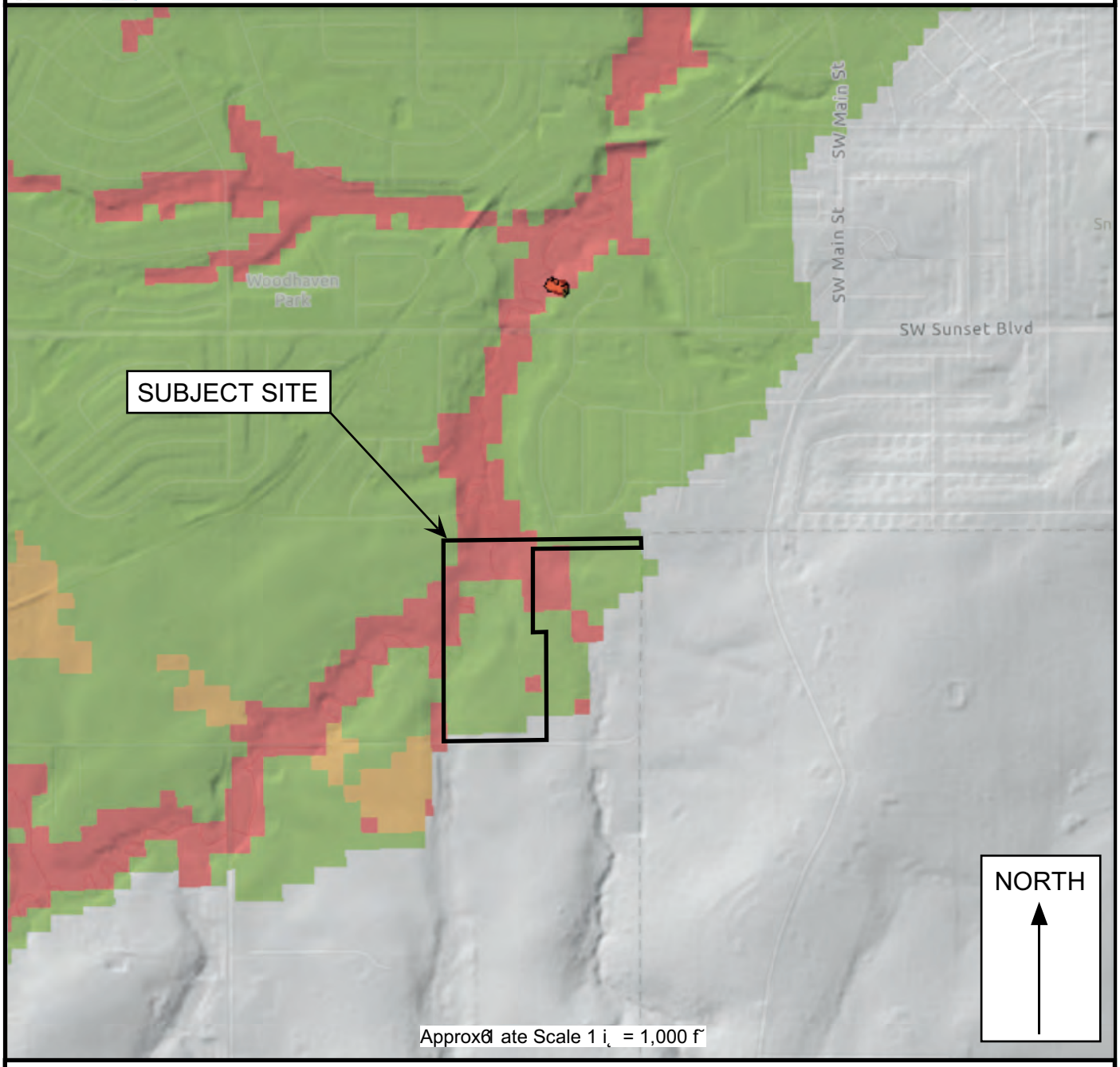
#˙ te: 1/24/2022
#r˙$ n by: EKR

Base map: Oregon Department of Geolog& and M˜ner˙¸ Industr˜e2 2022, Statew˜de Landsl˜de Infor^ ation Database for Oregon (SLID4<: https://g˘s.dog˙^˜ +oregon.go=(maps/sl˜do/

Project: 0 edar Creek Gardens Sher$ ood, Oregon	Project No. 22--./)	FIGURE 2

14835 SW 72n! A"# $e
Po&() ! , Oreg% 97224
T#I: (¸/˝0 598-8445

LIDAR BASED VICINITY MAP WITH LIQUEFACTION HAZARD



KEY

- H60h Li?uefaction H˙ 8˙ r+
- 5 oderate Li?uefaction H˙ 8˙ r+
- Low Li?uefaction H˙ 8˙ r+
- No Li?uefaction H˙ 8˙ r+ Mapped

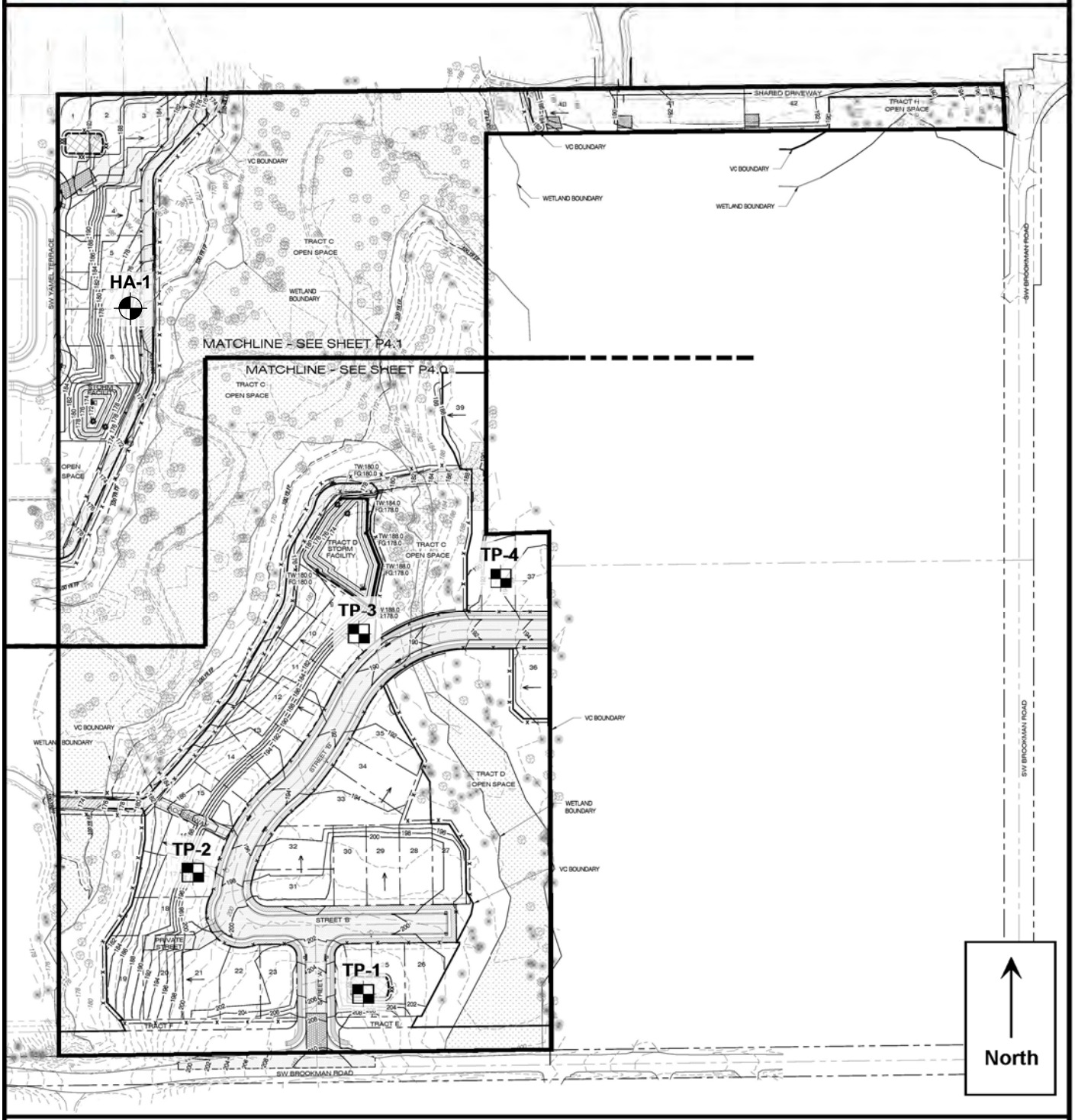
ˆ ˙ te: 1/24/2022
Dr˙˝ n by: EK

Base maps: Ore0on Department of Geolog˜ and M6ner˙4 Industr6s, 2022, Ore0on Haz97: Statew6le Geohazards Vie˝ er and Statew6le Landsl6le Infor1 ˙˜6on D˙ tabase for Oregon (SLIDO=˝ .˜˜2-˙""06s.dog˙16 &regon.go9".˙8 97/ and h˜˜2-˙""06s.dog˙16 &regon.go9"1˙2-"-4 6-o/

Project: Cedar Creek Gardens Sher˝ ood, Ore0o¸	Project No. 22-()*$	FIGURE 3

GEOPACIFIC
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445

SITE GRADING PLAN AND EXPLORATION LOCATIONS



Legend

TP-1
Test Pit Designation and Approximate Location

HA-1
Hand Auger Boring Designation and Approximate Location

Date: 1/24/2022
Drawn by: EKR

0 200'
APPROXIMATE SCALE 1"=200'

Project: Cedar Creek Gardens Sherwood, Oregon	Project No. 21-5974	FIGURE 4

14835 SW 72nd A"enue
Portland, Oregon 97224
Tel: (˝)'* 598-8445

TEST PIT LOG

Pr˝: ect: ¸ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	Test Pit No. **TP-1**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˙	˝ isture ontent (° ¸	Water earing " one	Material Description
2	9(9					˙ oderately or! anic SILT (˙) , light br˝ < n, roots throughout, loose, moist (Topsoil > ˝ ri?on)
	2(9					
&	&(5					˙ edium stiff to very stiff, clayey SILT (˙) , li! ht br˝ < n, mi$aceous, strong orange and gray mottling, trace roots to 3 feet, trace black staining, moist (Willa ette For ation
ˆ	ˆ(9					
1	&(5					
5						
6						
3						
7						
8						
29						
22						
2&						
2ˆ						
21						
25						
26						Test Pit Terminated at 16 Feet.
23						Note: No groundwater or seepage encountered.

)*+*' D

100 to 1,000 g ag Sample

5 Gal. ucket ucket Sample

Shelby Tube Sample

Seepage

˜ ater earin! Zone

˜ ater Level at Abandonment

Date Ex$avated: 1˘2ˆ˘23

)˝! ! ed By: B. Rapp

Surface Elevation:

14835 SW 72nd A"enue
Portland, Oregon 97224
Tel: (˝)'* 598-8445

TEST PIT LOG

Pr˝: ect: ˛ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˙	˝ isture ontent (° ˛	Water earing " one	Material Description
2	&(9					>i! hly or! anic (9-6 inches) to moderately or! anic (6-10 inches) SILT (˙) , dark br˝< n, roots throughout, moist (Topsoil Hori?on)
&	ˆ(9					Very stiff, clayey SILT (˙) , li! ht br˝ <n, mi$aceous, strong orange and gray ˝ ttling, trace fine roots to 3 feet, moist (Willamette Formation)
ˆ	&(9					
1	ˆ(9					
5						
6						
3						
7						
8						
29						
22						
2&						3 inch thick minerali?ed fragipan at contact
2ˆ						Stiff, SILT (ML), blue gray, micaceous, moist, (Willa ette Formation)
21						Test Pit Terminated at 13 Feet.
25						Note: No groundwater or seepage encountered.
26						
23						

)*+*' D

100 to 1,000 g ag Sample

5 Gal. ucket ucket Sample

Shelby Tube Sample

Seepage

˝ ater earin! Zone

˝ ater Level at Abandonment

Date Ex$avated: 1˘2ˆ˘23
)˝! ! ed By: B. Rapp
Surface Elevation:

14835 SW 72nd A"enue
Portland, Oregon 97224
Tel: (˝)'* 598-8445

TEST PIT LOG

Pr˝: ect: ¸ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˙)	˝ isture ontent (° ˙	Water earing " one	Material Description
2	&(5					)˝< or! anic SILT (˙) , dark br˝< n, roots throughout, 4 inch thick root mat, loose, moist (Topsoil > ˝ ri?on)
&	1(5					Stiff to very stiff, clayey SILT (˙) , li! ht br˝ < n, mi$aceous, strong orange and ! ray mottling, roots to 3 feet, moist (Willamette Formation)
ˆ	ˆ(9					
1	ˆ(9					
5						
6						
3						
7						
8						
29						
22						
2&						˙ edium stiff to stiff, SILT (˙) , li! ht br˝ < n, mi$aceous, strong orange and gray ˝ ttling, dilatant, very m˝ ist (Willamette Formation)
2ˆ						
21						Test Pit Terminated at 13 Feet.
25						Note: No groundwater or seepage encountered.
26						
23						

)*+*' D

100 to 1,000 g ag Sample

5 Gal. ucket ucket Sample

Shelby Tube Sample

Seepage

˜ ater earin! Zone

˜ ater Level at Abandonment

Date Ex$avated: 1˘2ˆ˘23

)˝! ! ed By: B. Rapp

Surface Elevation:

14835 SW 72nd A"enue
Portland, Oregon 97224
Tel: (˝)'* 598-8445

TEST PIT LOG

Pr˝: ect: ˛ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	Test Pit No. **TP-4**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˛	˝ isture ontent (° ˛	Water earing " one	Material Description
2	2(5					˙ oderately to hi! hly or! anic (9-6 inches) to l˝< to moderately or! anic (6-20 inches) SILT (˙) , dark br˝< n, roots throughout, moist (Topsoil Hori?on)
&	ˆ(9					
ˆ	&(5					Stiff to very stiff, clayey SILT (˙) , light br˝ < n, roots to 3 feet, subtle orange and gray m˝ ttling, m˝ ist (Willa ette For ation
1	1(5					
5						
6						
3						
7						
8						
29						
22						
2&						
2ˆ						
21						
25						Stiff, SILT (ML), blue gray, micaceous, dilatant, moist to very ˝ ist (Willamette For ation)
26						
23						Test Pit Terminated at 16 Feet. Note: Groundwater seepage encountered at 8.5 feet. Discharge visually estimated at approximately ¼ gallon per minute.

)*+*' D

100 to 1,000 g ag Sample

5 Gal. ucket ucket Sample

Shelby Tube Sample

Seepage

˝ ater earin! Zone

˝ ater Level at Abandonment

Date Ex$avated: 1˘2˘˘23

)˝! ! ed By: B. Rapp

Surface Elevation:

14835 SW 72nd A"enue
Portland, Oregon 97224
Tel: (˝)'* 598-8445

,! ND A. GER LOG

Pr˝: ect: ˛ edar Creek Gardens Sher< ood, Ore! ˝ n	Pr˝: ect No. 22-5831	> and Auger '˝ (,! +˘

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb˝ft˙	˝ isture ontent (° ˛	Water earing " one	Material Description
2						˙ oderately to hi! hly or! anic SILT (˙) , dark br˝< n, many roots throughout, loose, moist (Topsoil > ˝ ri?on)
&						Stiff, clayey SILT (˙) , li! ht br˝ < n, mi$aceous, strong orange and gray mottlin! ; trace roots, trace black staining, moist (˜ illamette Formation)
ˆ						
1						Stiff to very stiff, SILT (˙) , trace clay, light br˝ < n, micaceous, strong orange and gray mottling, moist (Willamette Formation)
5						
6						Test Pit Terminated at 6 Feet. Note: No groundwater or seepage encountered.
3						
7						
8						
29						
22						
2&						
2ˆ						
21						
25						
26						
23						

)*+*' D

100 to 1,000 g ag Sample

5 Gal. ucket ucket Sample

Shelby Tube Sample

Seepage

˜ ater earin! Zone

˜ ater Level at Abandonment

Date Ex$avated: 1/13/22

)˝! ! ed By: B. Rapp

Surface Elevation:

==========

DARWin(tm) - Pavement Design

A Proprietary AASHTOWARE(tm)
Computer Software Product

Flexible Structural Design Module

Project Description
22-5974 - Cedar Creek Gardens - Street A & Street B

Flexible Structural Design Module Data
18-kip ESALs Over Initial Performance Period: 66,888
Initial Serviceability: 4.2
Terminal Serviceability: 2.5
Reliability Level (%): 85
Overall Standard Deviation: .5
Roadbed Soil Resilient Modulus (PSI): 4,000
Stage Construction: 1

Calculated Structural Number: 2.76

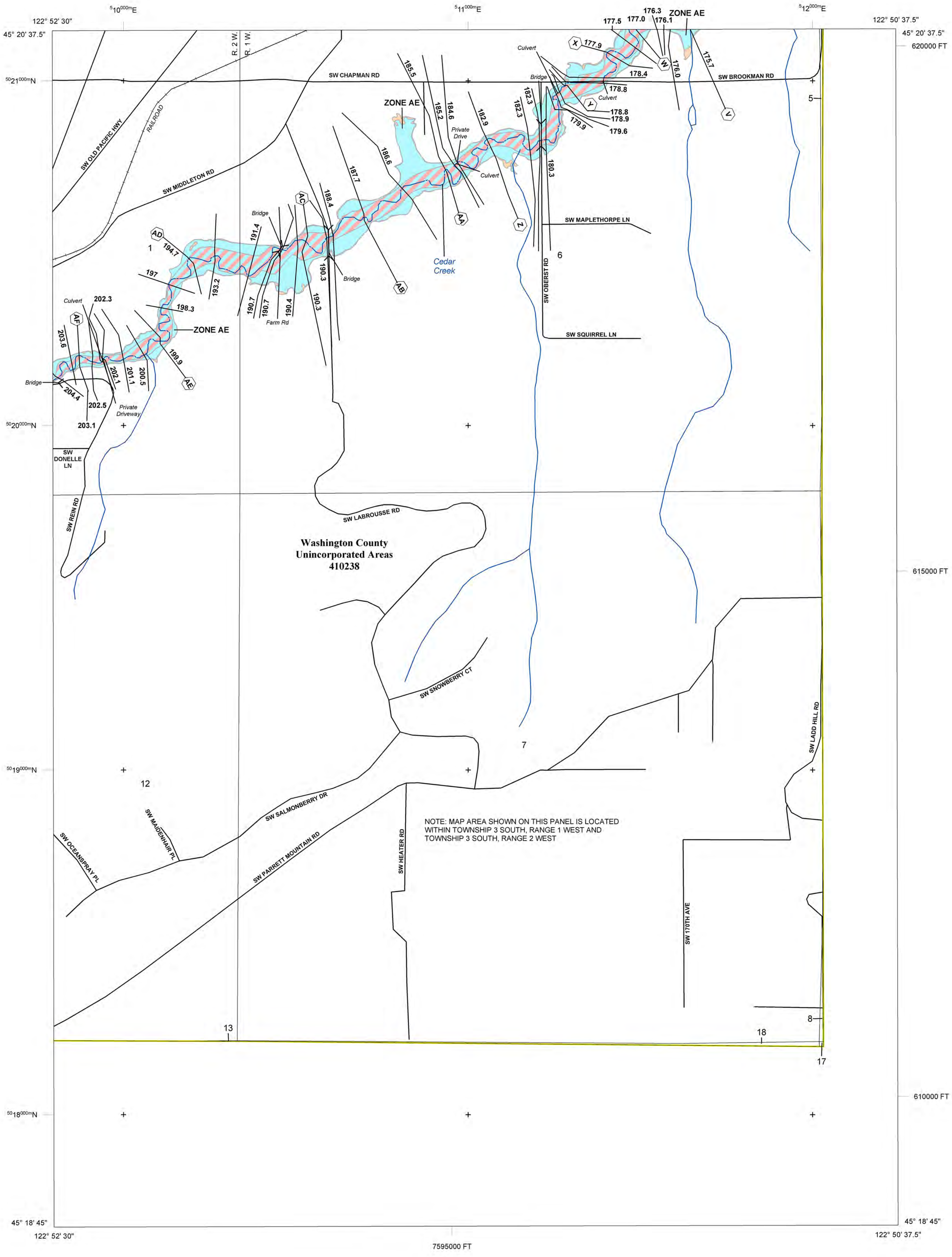
Specified Layer Design

Layer: 1
Material Description: New Dense ACP
Structural Coefficient (Ai): .42
Drainage Coefficient (Mi): 1
Layer Thickness (Di) (in): 4.00
Calculated Layer SN: 1.68

Layer: 2
Material Description: 3/4''-0 Agregate Levelling
Structural Coefficient (Ai): .1
Drainage Coefficient (Mi): 1
Layer Thickness (Di) (in): 2.00
Calculated Layer SN: .20

Layer: 3
Material Description: 1.5''-0 Aggregate Base
Structural Coefficient (Ai): .1
Drainage Coefficient (Mi): 1
Layer Thickness (Di) (in): 10.00
Calculated Layer SN: 1.00

Total Thickness (in): 16.00
Total Calculated SN: 2.88



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A,V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*

OTHER AREAS
- NO SCREEN Areas Determined to be Outside the 0.2% Annual Chance Floodplain *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- E 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was derived from multiple sources. Base Map files were provided in digital format by the Metro Data Resource Center. This information was compiled from many local sources and include transportation features, water features, political boundaries, and Public Land Survey System features.

SCALE

N

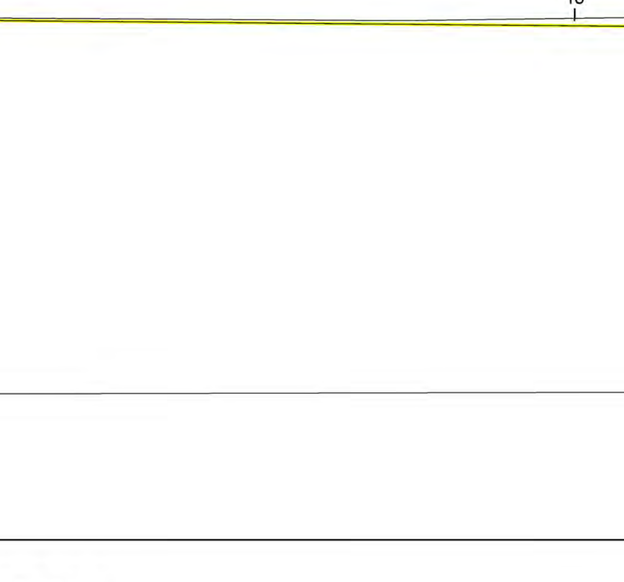
Map Projection:
Universal Transverse Mercator Zone 10N; North American Datum 1983; Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR



* PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

WASHINGTON COUNTY, OREGON
And Incorporated Areas

PANEL 603 OF 650

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
WASHINGTON COUNTY	410238	0603	F

VERSION NUMBER
2.3.3.3

MAP NUMBER
41067C0603F

MAP REVISED
OCTOBER 19, 2018

Tualatin Valley Fire & Rescue

FIRE CODE / LAND USE / BUILDING REVIEW APPLICATION

North Operating Center
11945 SW 70th Avenue
Tigard, OR 97223
Phone: 503-649-8577

South Operating Center
8445 SW Elligsen Rd
Wilsonville, OR 97070
Phone: 503-649-8577

REV 6-30-20

Project Information

Applicant Name: Ben Altman, Pioneer Design Group
Address: 9020 SW Washington Sq. Rd. #170, 97223
Phone: 971-708-6258
Email: baltman@pd-grp.com
Site Address: 16871 & 17033 SW Brookman Road
City: Sherwood
Map & Tax Lot #:
Business Name:
Land Use/Building Jurisdiction: Sherwood
Land Use/ Building Permit #

Choose from: Beaverton, Tigard, Newberg, Tualatin, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

Project Description

42-Lot Single Family Subdivision

Permit/Review Type (check one):

- ☑ Land Use / Building Review - Service Provider Permit
- ☐ Emergency Radio Responder Coverage Install/Test
- ☐ LPG Tank (Greater than 2,000 gallons)
- ☐ Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
  - * Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- ☐ Explosives Blasting (Blasting plan is required)
- ☐ Exterior Toxic, Pyrophoric or Corrosive Gas Installation (In excess of 810 cu.ft.)
- ☐ Tents or Temporary Membrane Structures (In excess of 10,000 square feet)
- ☐ Temporary Haunted House or similar
- ☐ OLCC Cannabis Extraction License Review
- ☐ Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

For Fire Marshal's Office Use Only

TVFR Permit #: 2021 - 0129
Permit Type: SPP
Submittal Date: 11/22/21
Assigned To: DARBY
Due Date:
Fees Due: N/A
Fees Paid:

Approval/Inspection Conditions
(For Fire Marshal's Office Use Only)

This section is for application approval only

DARBY 12/16/21
Fire Marshal or Designee Date

Conditions:

See Attached Conditions: ☐ Yes ☑ No

Site Inspection Required: ☐ Yes ☑ No

This section used when site inspection is required

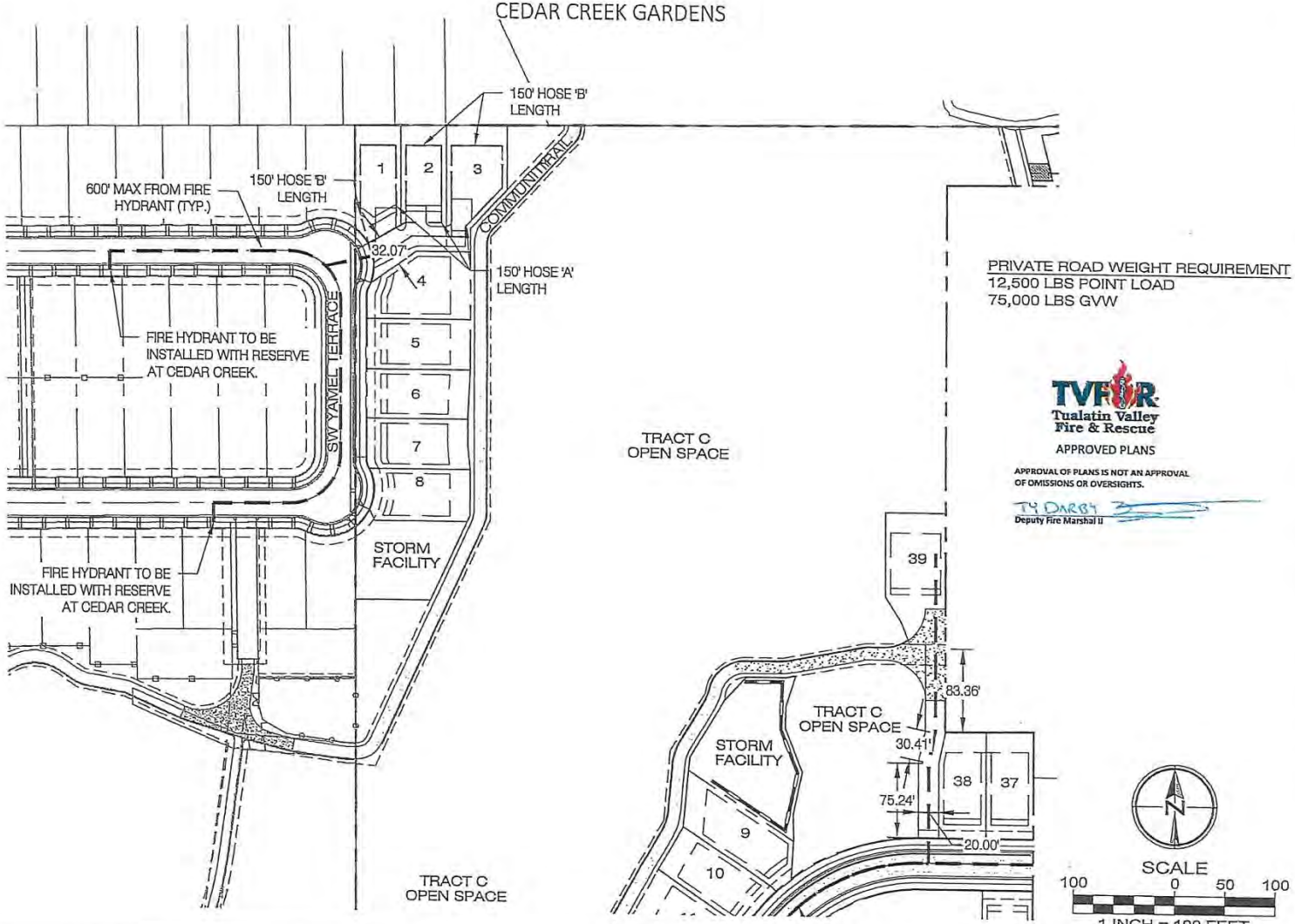
Inspection Comments:

Final TVFR Approval Signature & Emp ID Date

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
PORTLAND, OREGON
PH: 503.643.8286
HONOLULU, HAWAII
PH: 808.763.2376
WWW.PD-GRP.COM
Designed by MLS Date 09/2021
Drawn by CFS Date 09/2021
Reviewed by MLS Date 09/2021
Project No. 285-021 REF.
Horiz. Scale:
Vert. Scale:
FS1.DWG
Project CEDAR CREEK GARDENS
No. 285-021
Type PLANNING
Sheet 1 of 3
FS1 PLAN
CEDAR CREEK GARDENS
PRIVATE ROAD WEIGHT REQUIREMENT
12,500 LBS POINT LOAD
75,000 LBS GVW
TVF&R
Tualatin Valley Fire & Rescue
APPROVED PLANS
APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.
Deputy Fire Marshal II
SCALE
0 50 100
1 INCH = 100 FEET
TRACT C OPEN SPACE
STORM FACILITY
TRACT C OPEN SPACE
TRACT D OPEN SPACE
600' MAX FROM FIRE HYDRANT (TYP.)
PROPOSED FIRE HYDRANT
SEWER ESMNT
COMMUNITY TRAIL
ACCESSWAY
STREET 'A'
STREET 'B'
PRIVATE STREET
TRACT E
TRACT F
SW BROOKMAN ROAD
150' HOSE 'A' LENGTH
150' HOSE 'B' LENGTH
NO PARKING
FIRE LANE
TOW AWAY ZONE
20.00'
28.00'
30.41'
75.24'
83.36'

FS1 PLAN

CEDAR CREEK GARDENS



PIONEER DESIGN GROUP
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PORTLAND, OREGON | HONOLULU, HAWAII
PH: 503.643.8286 PH: 808.753.2376
WWW.PD-GRP.COM

Designed by	MLS	Date	09/2021
Drawn by	CFS	Date	09/2021
Reviewed by	MLS	Date	09/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

FS1.DWG

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
2 of 3

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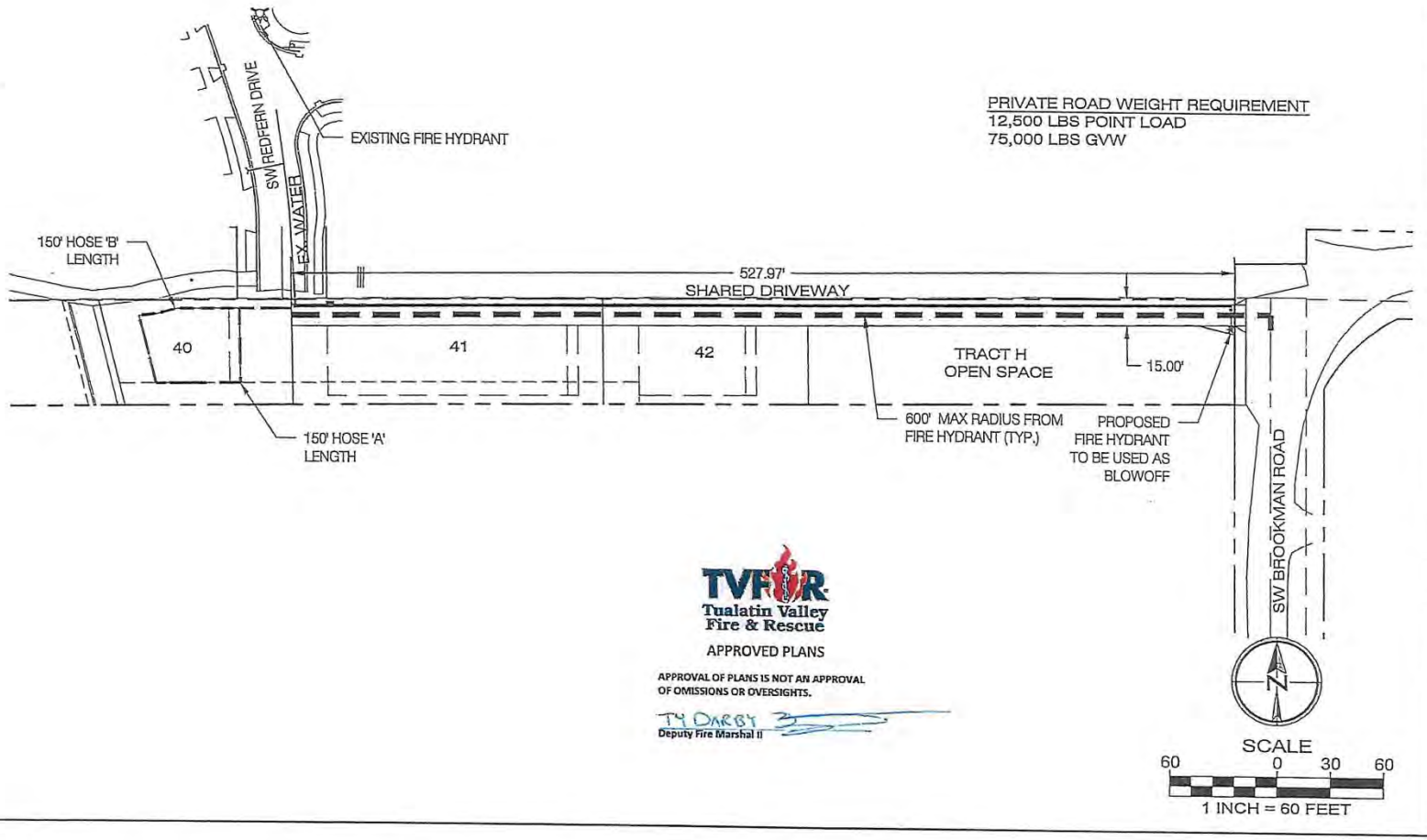
Exhibit A18

FS1 PLAN

CEDAR CREEK GARDENS



PRIVATE ROAD WEIGHT REQUIREMENT
12,500 LBS POINT LOAD
75,000 LBS GVW

TVFR
Tualatin Valley Fire & Rescue

APPROVED PLANS

APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.

TY DARBY
Deputy Fire Marshal II

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PORTLAND, OREGON | HONOLULU, HAWAII
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Designed by	MLS	Date	09/2021
Drawn by	CFS	Date	09/2021
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285-021
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Sheet
3 of 3

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Exhibit A18

Tualatin Valley Fire & Rescue
www.tvfr.com

Command & Business Operations Center
and North Operating Center
11945 SW 70th Avenue
Tigard, Oregon 97223-8566
503-649-8577

South Operating Center
8445 SW Elligsen Road
Wilsonville, Oregon
97070-9641
503-649-8577

Training Center
12400 SW Tonquin Road
Sherwood, Oregon
97140-9734
503-259-1600

FIRE DEPARTMENT ACCESS AND WATER SUPPLY PERMIT CHECKLIST

Project Name	Address and/or Legal Description	TVF&R Permit #
Cedar Creek Gardens	16871 & 17033 SW Brookman Road, Sherwood	
Description of Proposed Work:	42-Lot Single Family Subdivision	Jurisdiction:
Bldg. Square Footage:	Type of Construction: None	Fire Sprinklers: Y☐ N☐
Fire Alarms: Y☐ N☒	Bldg. Height: (Measured to gutter line or top of parapet)	ERRC ☐ MERRC ☐ N/A ☐

Complete checklist below if the submittal involves constructing or altering a building.

ITEM #	PROVIDED		REQUIREMENT	CODE REF
1	Y☒	N/A☐	Fire service plans shall consist of a site plan and elevation views of buildings. The site plan shall be labeled as FS-1. Elevation view sheets shall be FS-2, FS-3, etc.	OFC 105.4.2
2	Y☒	N/A☐	Access roads shall be within 150 feet of all portions of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building or facility. An approved turnaround is required if the remaining distance to an approved intersecting roadway, as measured along the fire apparatus access road, is greater than 150 feet. (OFC 503.1.1)	OFC 503.1.1
3	Y☒	N/A☐	Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround. Diagrams can be found in the corresponding guide located at: http://www.tvfr.com/DocumentCenter/View/1296.	OFC 503.2.5 & D103.1
4	Y☐	N/A☒	Buildings exceeding 30 feet in height or three stories in height shall have at least two separate means of fire apparatus access.	D104.1
5	Y☐	N/A☒	Buildings or facilities having a gross building area of more than 62,000 square feet shall have at least two approved separate means of fire apparatus access. Exception: Projects having a gross building area of up to 124,000 square feet that have a single approved fire apparatus access road when all buildings are equipped throughout with approved automatic sprinkler systems.	OFC D104.2
6	Y☐	N/A☒	Multifamily projects having more than 100 dwelling units shall be provided with two separate and approved fire apparatus access roads. Exception: Projects having up to 200 dwelling units may have a single approved fire apparatus access road when all buildings, including nonresidential occupancies, are equipped throughout with an approved automatic sprinkler system in accordance with section 903.3.1.1, 903.3.1.2. Projects having more than 200 dwelling units shall be provided with two separate and approved fire apparatus roads regardless of whether they are equipped with an approved automatic sprinkler system.	OFC D106
7	Y☐	N/A☒	Buildings with a vertical distance between the grade plane and the highest roof surface that exceeds 30 feet in height shall be provided with a fire apparatus access road constructed for use by aerial apparatus with an unobstructed driving surface width of not less than 26 feet. For the purposes of this section, the highest roof surface shall be determined by	OFC D105.1, D105.2

ITEM #	PROVIDED		REQUIREMENT	CODE REF
			measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of the parapet walls, whichever is greater. Any portion of the building may be used for this measurement, provided that it is accessible to firefighters and is capable of supporting ground ladder placement.	
8	Y ☒	N/A ☐	Developments of one- or two-family dwellings, where the number of dwelling units exceeds 30, shall be provided with separate and approved fire apparatus access roads and shall meet the requirements of Section D104.3. Exception: Where there are more than 30 dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with section 903.3.1.1, 903.3.1.2, or 903.3.1.3 of the International Fire Code, access from two directions shall not be required.	OFC D107
9	Y ☐	N/A ☒	At least one of the required aerial access routes shall be located within a minimum of 15 feet and a maximum of 30 feet from the building, and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial access road is positioned shall be approved by the Fire Marshal. Overhead utility and power lines shall not be located over the aerial access road or between the aerial access road and the building.	OFC D105.3, D105.4
10	Y ☐	N/A ☒	Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the area to be served (as identified by the Fire Marshal), measured in a straight line between accesses.	OFC D104.3
11	Y ☒	N/A ☐	Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (26 feet adjacent to fire hydrants and an unobstructed vertical clearance of not less than 13 feet 6 inches.	OFC 503.2.1 & D103.1
12	Y ☒	N/A ☐	The fire district will approve access roads of 12 feet for up to three dwelling units (Group R-3) and accessory (Group U) buildings.	OFC 503.1.1
13	Y ☒	N/A ☐	Where access roads are less than 20 feet and exceed 400 feet in length, turnouts 10 feet wide and 30 feet long may be required and will be determined on a case by case basis.	OFC 503.2.2
14	Y ☒	N/A ☐	Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, "No Parking" signs shall be installed on one or both sides of the roadway and in turnarounds as needed. Signs shall read "NO PARKING - FIRE LANE" and shall be installed with a clear space above grade level of 7 feet. Signs shall be 12 inches wide by 18 inches high and shall have red letters on a white reflective background.	OFC D103.6
15	Y ☒	N/A ☐	Where required, fire apparatus access roadway curbs shall be painted red (or as approved) and marked "NO PARKING FIRE LANE" at 25-foot intervals. Lettering shall have a stroke of not less than one inch wide by six inches high. Lettering shall be white on red background	OFC 503.3
16	Y ☒	N/A ☐	Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet and shall extend 20 feet before and after the point of the hydrant.	OFC D103.1
17	Y ☐	N/A ☒	Where access roads are less than 20 feet and exceed 400 feet in length, turnouts 10 feet wide and 30 feet long may be required and will be determined on a case by case basis.	OFC 503.2.2
18	Y ☒	N/A ☐	Fire apparatus access roads shall be of an all-weather surface that is easily distinguishable from the surrounding area and is capable of supporting not less than 12,500 pounds point load (wheel load) and 75,000 pounds live load (gross vehicle weight). Documentation from a registered engineer that the final construction is in accordance with approved plans or the requirements of the Fire Code may be requested.	OFC 503.2.3
19	Y ☒	N/A ☐	The inside turning radius and outside turning radius shall not be less than 28 feet and 48 feet respectively, measured from the same center point.	OFC 503.2.4 & D103.3
20	Y ☒	N/A ☐	Fire apparatus access roadway grades shall not exceed 15%. Alternate methods and materials may be available at the discretion of the Fire Marshal (for grade exceeding 15%).	OFC D103.2
21	Y ☐	N/A ☒	Approved forest dwellings (in which the structure meets all County forest dwelling fire siting, fire retardant roof, and spark arrestor requirements) are allowed up to 20% maximum grade. Access roads greater than 20% shall be considered on a case-by-case basis. Forest dwelling access roads shall be an all-weather surface capable of supporting imposed loads of not less than 37,000 pounds gross vehicle weight and be no less than 12 feet minimum width. All other access requirements, including turnarounds shall be determined upon a heavy brush unit response capability to the individual property.	OFC 503.1.1 & D102.1.1

ITEM #	PROVIDED		REQUIREMENT	CODE REF
22	Y ☒	N/A ☐	Turnarounds shall be as flat as possible and have a maximum of 5% grade with the exception of crowning for water run-off.	OFC 503.2.7 & D103.2
23	Y ☒	N/A ☐	Intersections shall be level (maximum 5%) with the exception of crowning for water run-off.	OFC 503.2.7 & D103.2
24	Y ☐	N/A ☒	Portions of aerial apparatus roads that will be used for aerial operations shall be as flat as possible. Front to rear and side to side maximum slope shall not exceed 10%.	OFC D103.2
25	Y ☐	N/A ☒	Gates securing fire apparatus roads shall comply with all of the following: 1. Minimum unobstructed width shall be not less than 20 feet (or the required roadway surface width). 2. Gates shall be set back at minimum of 30 feet from the intersecting roadway or as approved. 3. Electric gates shall be equipped with a means for operation by fire department personnel. 4. Electric automatic gates shall comply with ASTM F 2200 and UL 325.	OFC D103.5, & 503.6
26	Y ☐	N/A ☒	Private bridges shall be designed and constructed in accordance with the State of Oregon Department of Transportation and American Association of State Highway and Transportation Officials Standards *Standard Specification for Highway Bridges*. Vehicle load limits shall be posted at both entrances to bridges when required by the Fire Marshal.	OFC 503.2.6
27	Y ☒	N/A ☐	Applicants shall provide documentation of a fire hydrant flow test or flow test modeling of water availability from the local water purveyor if the project includes a new structure or increase in the floor area of an existing structure. Tests shall be conducted from a fire hydrant within 400 feet for commercial projects, or 600 feet for residential development. Flow tests will be accepted if they were performed within 5 years as long as no adverse modifications have been made to the supply system. Water availability information may not be required to be submitted for every project.	OFC Appendix B
28	Y ☐	N/A ☒	Where a portion of a commercial building is more than 400 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the building, on-site fire hydrants and mains shall be provided.	OFC 507.5.1
29	Y ☐	N/A ☒	Where the most remote portion of a residential structure is more than 600 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the structure(s), on-site fire hydrants and mains shall be provided.	OFC 507.5.1
30	Y ☐	N/A ☒	Rural one-and-two-family dwellings, where there is no fixed and reliable water supply and there is approved access, shall not be required to provide a firefighting water supply.	OFC B103
31	Y ☐	N/A ☒	Detached U occupancies, in rural areas, that are in excess of 3,600 square feet are not required to have a water supply when they have approved fire department access.	OFC D102
32	Y ☐	N/A ☒	Fire hydrants shall be located not more than 15 feet from an approved fire apparatus access roadway unless approved by the Fire Marshal.	OFC C102.1
33	Y ☒	N/A ☐	Where fire hydrants are subject to impact by a motor vehicle, guard posts, bollards or other approved means of protection shall be provided.	OFC 507.5.6 & OFC 312
34	Y ☐	N/A ☒	FDCs shall be located within 100 feet of a fire hydrant (or as approved). Hydrants and FDC's shall be located on the same side of the fire apparatus access roadway or drive aisle, fully visible, and recognizable from the street or nearest point of the fire department vehicle access or as otherwise approved.	OFC 912.2.1 & NFPA 13

ITEM #	PROVIDED		REQUIREMENT	CODE REF
35	Y ☐	N/A ☒	In new buildings where the design reduces the level of radio coverage for public safety communications systems below minimum performance levels, a distributed antenna system, signal booster, or other method approved by TVF&R and Washington County Consolidated Communications Agency shall be provided. http://www.tvfr.com/DocumentCenter/View/1296. • Emergency responder radio system testing and/or system installation is required for this building. Please contact me (using my contact info below) for further information including an alternate means of compliance that is available. If the alternate method is preferred, it must be requested from TVF&R prior to issuance of building permit. • Testing shall take place after the installation of all roofing systems; exterior walls, glazing and siding/cladding; and all permanent interior walls, partitions, ceilings, and glazing. MERRC Q&A MERRC Q&A MERRC Permit Application MERRC Permit Application	OFC 510, Appendix F, & OSSC 915
36	Y ☐	N/A ☒	A Knox box for building access may be required for structures and gates. See Appendix B for further information and detail on required installations. Order via www.knoxbox.com or contact TVF&R for assistance and instructions regarding installation and placement.	OFC 506.1

P·R·I·D·E
DISPOSAL COMPANY
P.O. Box 820 Sherwood, OR 97140
Phone: (503) 625-6177 Fax: (503) 625-6179

February 9, 2022

Wayne Hayson
Planning Manager
9020 SW Washington Square Rd Suite 170
Portland, OR 97223

Re: 41 Lot subdivision – SW Brookman Rd

We have reviewed the site plan for the above-mentioned subdivision. We will be able to service the lots as they've been laid out. Each resident will be responsible for placing their totes curbside on the nearest public road on collection day.

Lots 2, 3, 19, 20, 39, 40, and 41 will be responsible for placing their totes curbside on the nearest public road on collection day.

If any future modifications are made to this project, it will require additional approval.

If you have any additional questions, feel free to contact me.

Sincerely,

Kristen Tabscott
Pride Disposal Company
ktabscott@pridedisposal.com
(503) 625-6177

Exhibit A19

P3.0

PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
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WWW.PD-GRP.COM

SCALE
1 INCH = 60 FEET

MATCHLINE - SEE THIS SHEET

MATCHLINE - SEE THIS SHEET

SW BROOKMAN ROAD

STREET B

STREET A

TRACT F

TRACT E

TRACT G PRIVATE

TRACT H OPEN SPACE

TRACT O OPEN SPACE

TRACT I OPEN SPACE

TRACT B OPEN SPACE

TRACT C STORM FACILITY

TRACT A STORM FACILITY

TRACT J OPEN SPACE

TRACT K OPEN SPACE

SHARED DRIVEWAY

EXISTING TRAIL

COMMUNITY TRAIL

SW WHEEL TERRACE

WETLAND BOUNDARY

VC BOUNDARY

100 YR FP

lancaster mobley

Cedar Creek Gardens Subdivision

Transportation Impact Analysis

Sherwood, Oregon

Date:
November 10, 2021

Prepared for:
Westwood Homes, LLC

Prepared by:
Jennifer Danziger, PE

RENEWS: 12/31/2021

List of Figures

List of Tables

Executive Summary

1. The proposed Cedar Creek Gardens subdivision will redevelop the properties located at 16871 and 17033 SW Brookman Road in Sherwood, Oregon. The proposed development includes the construction of 42 single-family homes, removing two existing homes for a net increase of 40 homes. Access to the site will be provided via two public street connections and one shared driveway connection along SW Brookman Road.
2. The proposed development is projected to generate an additional 32 morning peak hour, 41 evening peak hour trips, and 426 weekday trips.
3. No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. A review of existing sight lines and elevation profiles from Google Earth show that adequate sight distance can be available if the roadside vegetation is cleared with the development. Both the intersection sight distance and stopping sight distance can be met at the main site access and the shared driveway.
5. Left-turn lane warrants are not projected to be met at the site access intersection along SW Brookman Road upon completion and occupancy of the proposed development. Accordingly, installation of a left-turn lane at the site access intersection is not necessary or recommended.
6. All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.
7. Because the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both peak hours under all scenarios, agencies may wish to consider restriping the eastbound approach to provide a through and a right-turn lane. This change would eliminate occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping. The change is not necessary to accommodate the proposed development.
8. *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019, identified four intersections as currently exceeding acceptable jurisdictional standards. Based on the projected site trip impacts to these intersections, a total proportionate share fee to mitigate impacts of $69,274.39 was calculated.

Project Description

Introduction

This report describes and evaluates the transportation impacts associated with the proposed Cedar Creek Gardens subdivision located at 16871 and 17033 SW Brookman Road in Sherwood, Oregon. The proposed development includes the construction of 42 single-family homes, removing two existing homes for a net increase of 40 homes. Access to the site will be provided via two public street connections and one shared driveway connection along SW Brookman Road.

Based on correspondence with the City of Sherwood, a safety and capacity/level of service analysis was conducted at the following intersections:

1. SW Elwert Road/SW Sunset Boulevard at Highway 99W
2. SW Brookman Road at Highway 99W
3. SW Brookman Road at Middlebrook Site Access
4. SW Brookman Road at Main Site Access
5. SW Brookman Road at North Site Access

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The subject site is located at 16871 and 17033 SW Brookman Road and is situated adjacent to one in-process residential subdivision project: The Reserve at Cedar Creek. The site is located north of SW Brookman Road with The Reserve to the west. The subject property consists of two tax lots (3S10600 00107 and 00102) totaling approximately 20 acres. Each lot has an existing single-family house on the property which will be removed upon development.

Figure 1 displays a vicinity map of the project site, with the project site hatched and outlined in yellow. Other adjacent approved developments are shown in red, blue, and cyan. The future street network is represented with white. A site plan depicting the proposed project is provided in the appendix.

The site will take access from two public street connections and one shared driveway connection along SW Brookman Road. Eight (8) of the proposed homes will have driveways connecting to a roadway to be constructed as part of The Reserve subdivision. Their access to SW Brookman Road will be via a new roadway (SW White Oak Terrace) to be constructed as part of the Middlebrook subdivision. Thirty-one (31) of the proposed homes will access SW Brookman Road via a new roadway constructed with the subject subdivision. Three (3) of the proposed homes will share a driveway that will connect to SW Brookman Road at the northeast corner of the site.

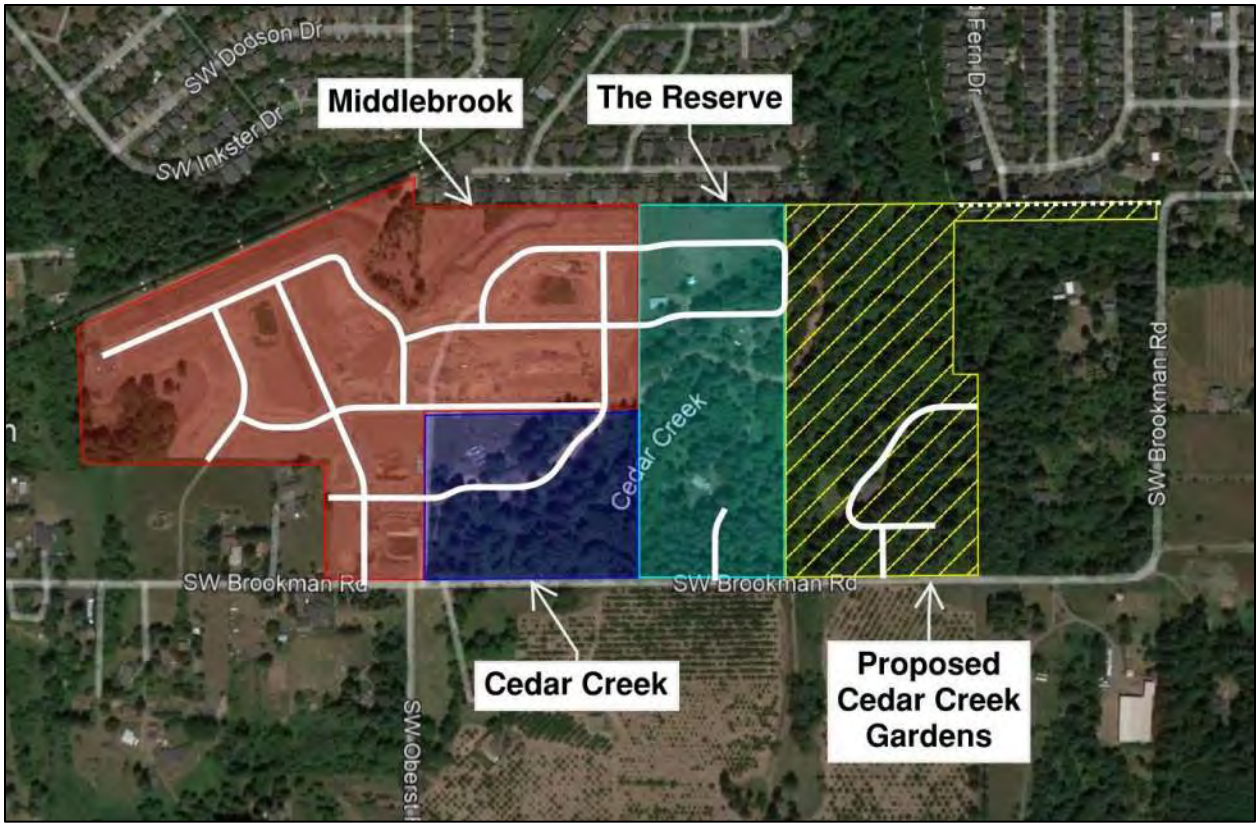


Figure 1: Project Location (image from Google Earth)

Vicinity Roadways

The proposed development is expected to impact three vicinity roadways. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Roadway	Jurisdiction	Functional Classification	Cross-Section	Speed (mph)	On-street Parking	Bicycle Lanes	Curbs & Sidewalks
Highway 99W	ODOT	Principal Arterial	4 Lanes	45-55 Posted	Not Permitted	Partial Both Sides	None
SW Elwert Rd/ SW Sunset Blvd	City of Sherwood	Arterial	2 to 3 Lanes	35 Posted	Not Permitted	Both Sides	Both Sides
SW Brookman Rd	Washington County	Arterial	2 Lanes	25/35/55 Posted/ Statutory	Not Permitted	None	None

Notes: Functional Classification based on the City of Sherwood Transportation System Plan

Study Intersections

The proposed development is expected to impact three vicinity intersections of significance. A summarized description of the study intersections is provided in Table 2.

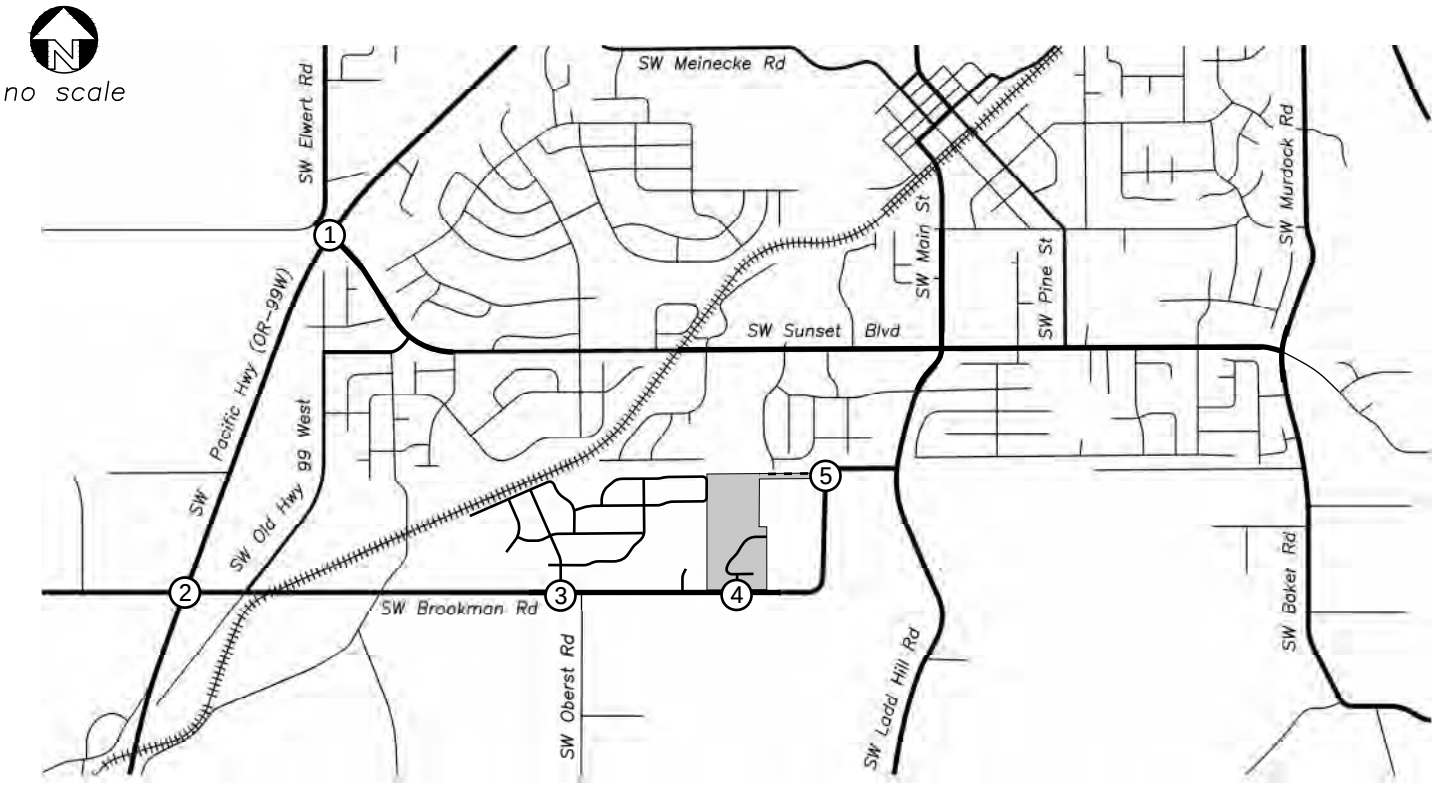
Table 2: Study Intersection Descriptions

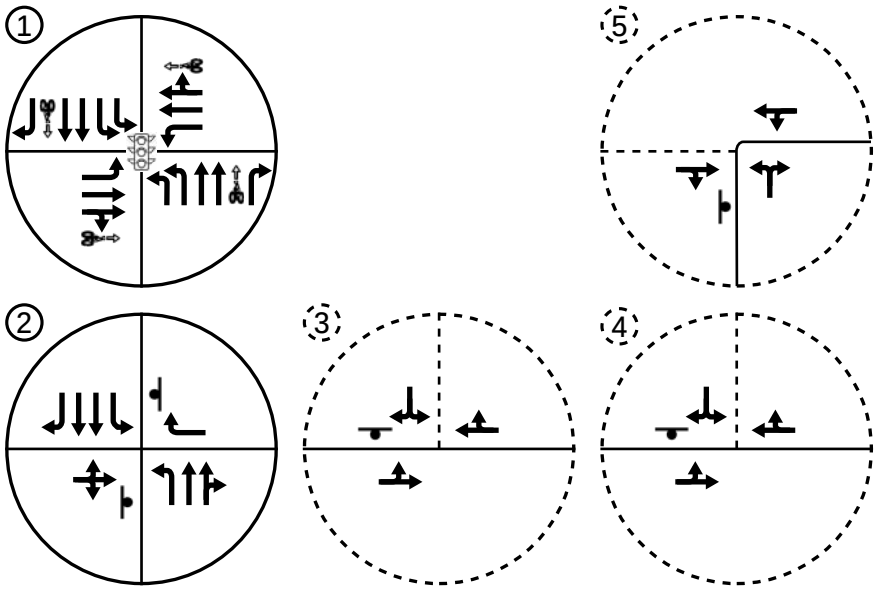
Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	SW Elwert Rd/SW Sunset Blvd at Highway 99W	Four-Legged	Signalized	WB/EB Permitted LT, NB/SB Protected LT
2	SW Brookman Rd at Highway 99W	Four-Legged	Stop-Controlled	EB/WB Stop Controlled Approach
3	SW Brookman Rd at Site Access	Three-Legged (Future)	Stop-Controlled	SB Stop Controlled Approach

A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.

Transit

No nearby transit service is available near the proposed development.





lancaster mobley

VICINITY MAP &
LANE CONFIGURATIONS

Figure 2
Cedar Creek Gardens
11/10/2021

Site Trips

Trip Generation

The proposed development includes the construction of 42 single-family homes. As part of the proposed development, two existing single-family homes will be removed for a net increase of 40 homes.

To estimate the number of site trips generated under existing and proposed conditions, trip rates from the *Trip Generation Manual*[1] were used. Specifically, the equations from land-use codes 210, *Single-Family Detached Housing*, were used based on the number of dwelling units.

As shown in Table 3, the trip generation calculations show that the proposed development is projected to generate an additional 32 morning peak hour, 41 evening peak hour trips, and 426 weekday trips. Detailed trip generation calculations are included in the technical appendix.

Table 3: Trip Generation Summary

Land Use	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
Proposed Development	210	42 DU	9	25	34	28	16	44	454
Existing Homes	*210*	*2 DU*	*-1*	*-1*	*-2*	*-2*	*-1*	*-3*	*-28*
Net New Site Trips			**8**	**24**	**32**	**26**	**15**	**41**	**426**

Trip Distribution

The directional distribution of site trips to/from the project site was referenced from *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019. The following trip distribution was used for analysis:

- Approximately 45 percent of site trips will travel to/from the north along Highway 99W
- Approximately 10 percent of site trips will travel to/from the north along SW Main Street
- Approximately 10 percent of site trips will travel to/from the north along SW Murdock Road
- Approximately 10 percent of site trips will travel to/from the south along Highway 99W
- Approximately 10 percent of site trips will travel to/from the south along SW Ladd Hill Road
- Approximately 10 percent of site trips will travel to/from the south along SW Baker Road
- Approximately 5 percent of site trips will travel to/from the west along SW Kruger Road

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

Four intersections were identified as exceeding acceptable operation standards in *The Reserve TIA*:

A. SW Sunset Boulevard at SW Woodhaven Drive

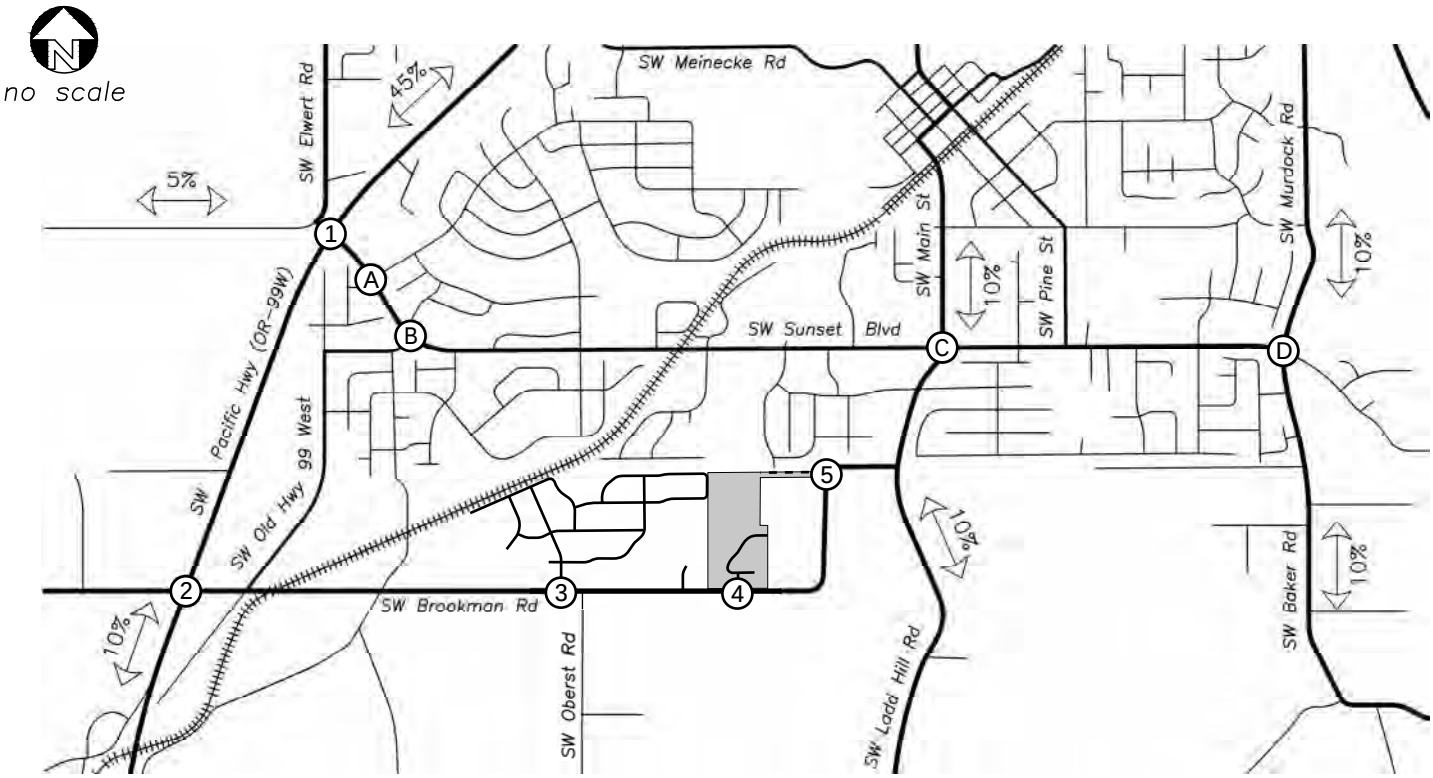
B. SW Sunset Boulevard at SW Timbrel Lane

C. SW Sunset Boulevard at SW Main Street/SW Ladd Hill Road

D. SW Sunset Boulevard at SW Murdock Road/SW Baker Road

Site trip assignment through these intersections was conducted to determine expected impacts from the proposed development to these intersections.

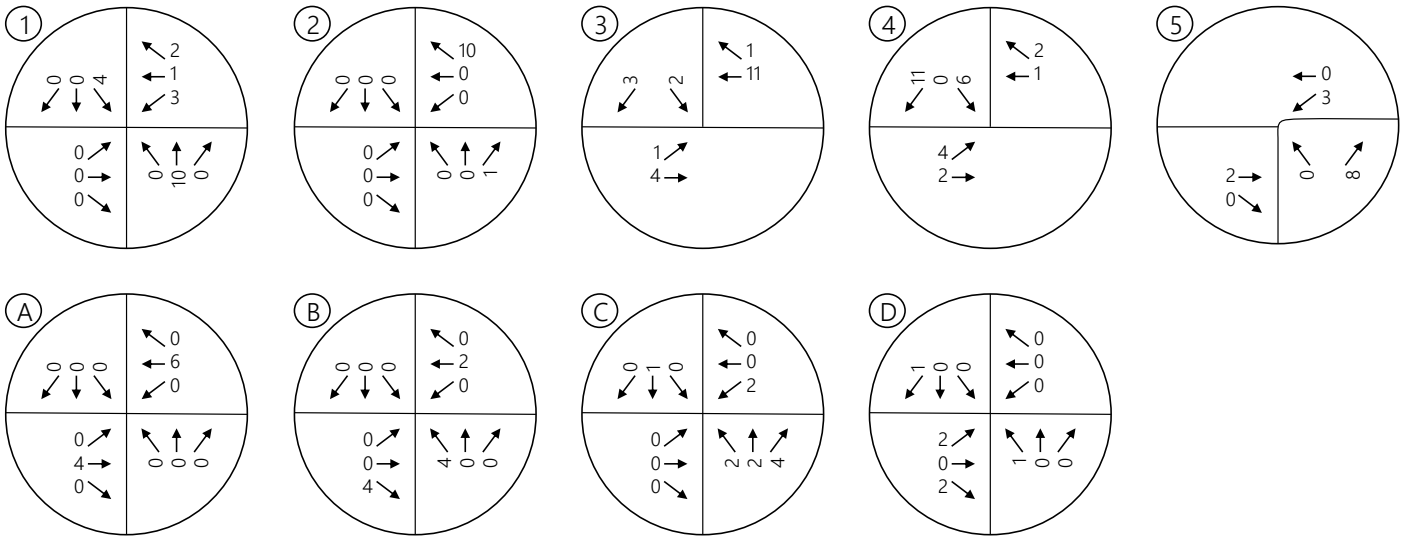
The trip assignment for site trips generated by the proposed development during is shown in Figure 3 for the morning peak hour and Figure 4 evening peak hour. This assignment reflects the layout of the proposed development with 8 homes using the Middlebrook subdivision access, 31 homes using the main site access, and 3 homes using the shared driveway.



NET TRIP GENERATION

	In	Out	Total
AM	8	24	32
PM	26	15	41
DAILY	213	213	426

AM PEAK HOUR



lancaster mobley

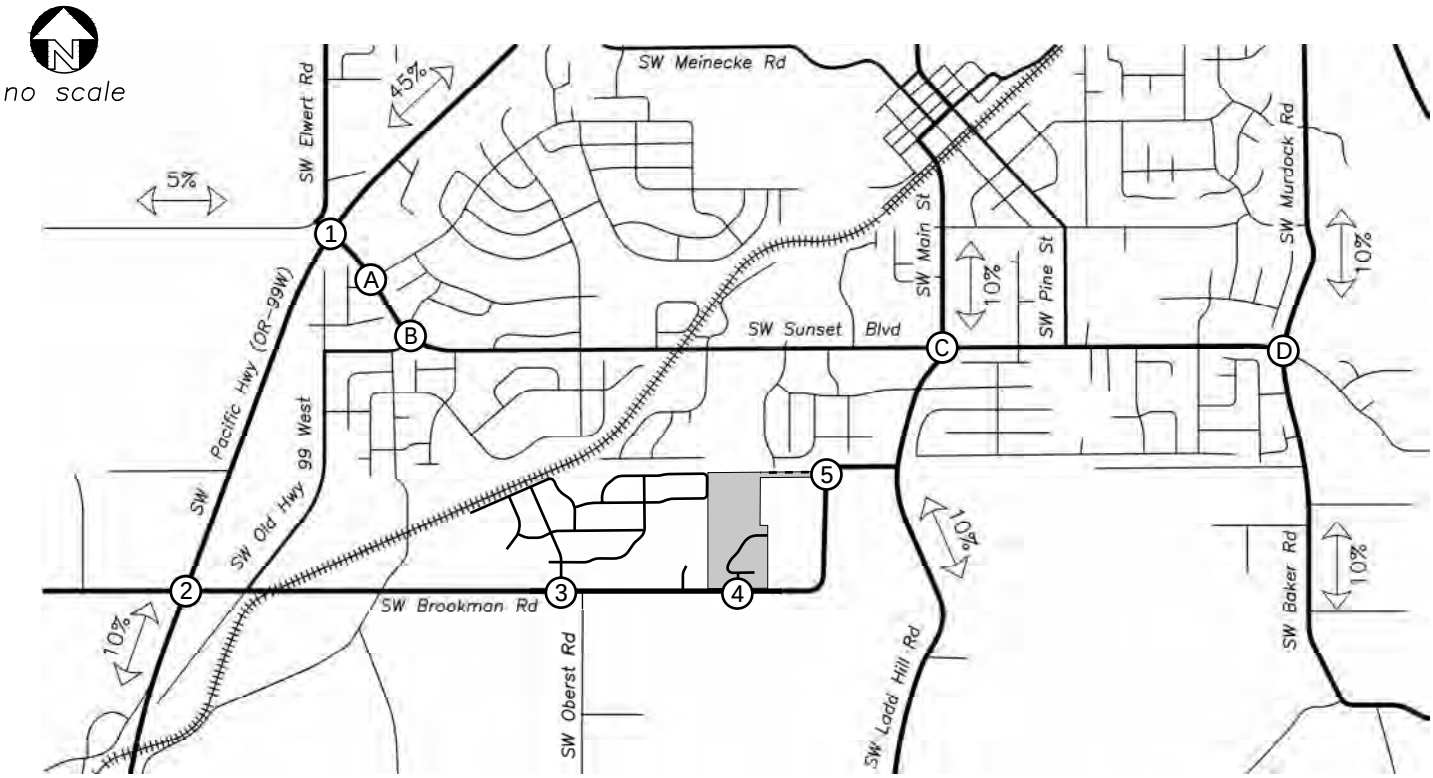
TRIP DISTRIBUTION & ASSIGNMENT - AM PEAK

TRAFFIC VOLUMES

Figure 3

Cedar Creek Gardens

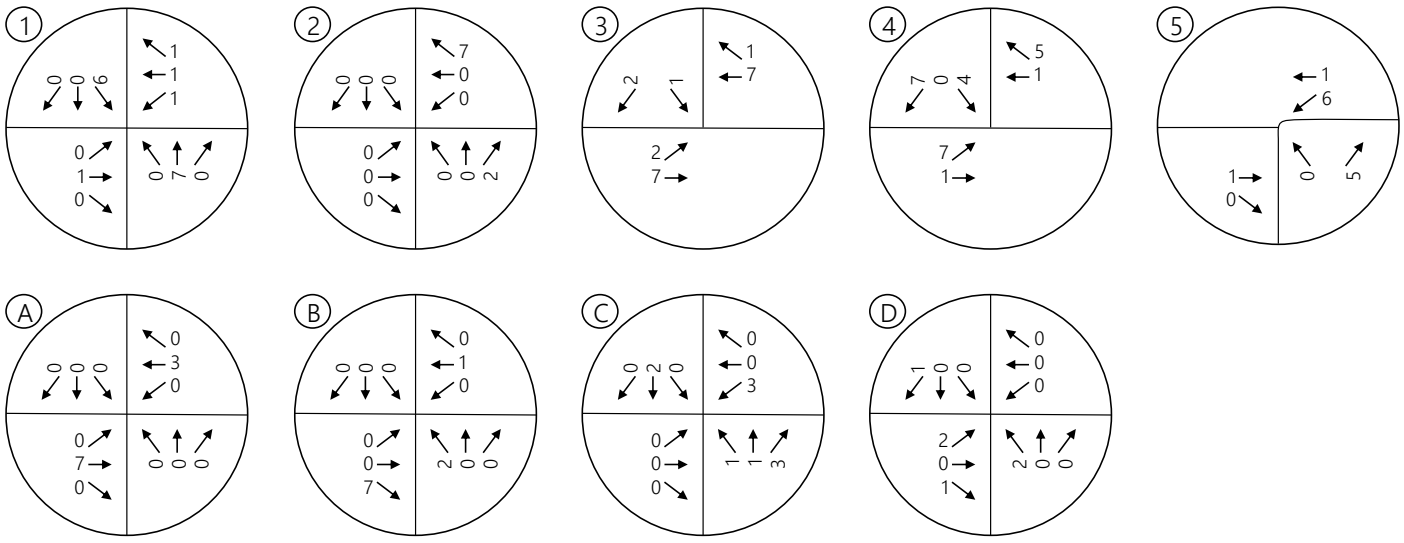
11/10/2021



NET TRIP GENERATION

	In	Out	Total
AM	8	24	32
PM	26	15	41
DAILY	213	213	426

PM PEAK HOUR



lancaster mobley

TRIP DISTRIBUTION & ASSIGNMENT - PM PEAK

TRAFFIC VOLUMES

Figure 4

Cedar Creek Gardens

11/10/2021

Traffic Volumes

Existing Conditions

Due to the ongoing COVID-19 viral pandemic, traffic volumes have been depressed relative to normal conditions since mid-March 2020. Under these conditions, traditional traffic count data collection methods are not recommended. Therefore, to estimate existing traffic conditions, year 2017 traffic count data was referenced from *The Reserve TIA*, specifically volumes from Figures 4 and 5. Consistent with background growth methodologies used in *The Reserve TIA*, the year 2017 volumes were increased by 1% annually along Highway 99W and by 2% annually on all other movements at the study intersections to reflect existing year 2021 conditions. Note, these volumes do not capture the traffic demand from Sherwood High School, which was opened in the fall of 2021.

Since the traffic counts were collected, the westbound approach of SW Brookman Road at Highway 99W has been restricted to right turns only. The westbound left-turn and through volumes have been reassigned to reflect the traffic change. Ten percent of these movement was assumed to travel northbound to the signal at SW Sunset Boulevard and then U-Turn to travel southbound. Ninety percent was assumed to travel to SW Sunset Boulevard via other routes and turn left to travel southbound.

Figure 5 shows the existing traffic volumes at study intersections during the morning and evening peak hours.

Background Conditions

To provide analysis of the impact of the proposed development on the existing transportation facilities, an estimation of future traffic volumes is required. To reflect future traffic conditions without the proposed subdivision, volumes from two studies were used to estimate the Year 2024 background traffic volumes. *Year 2024 Total Intersection Operations* (Figures 12 and 13) volumes were referenced from *The Reserve TIA* and the trip assignments from the *Cedar Creek Subdivision TIA* (Figures 2 and 3) were added to those volumes. These volumes reflect the opening of the new Sherwood High School Campus.

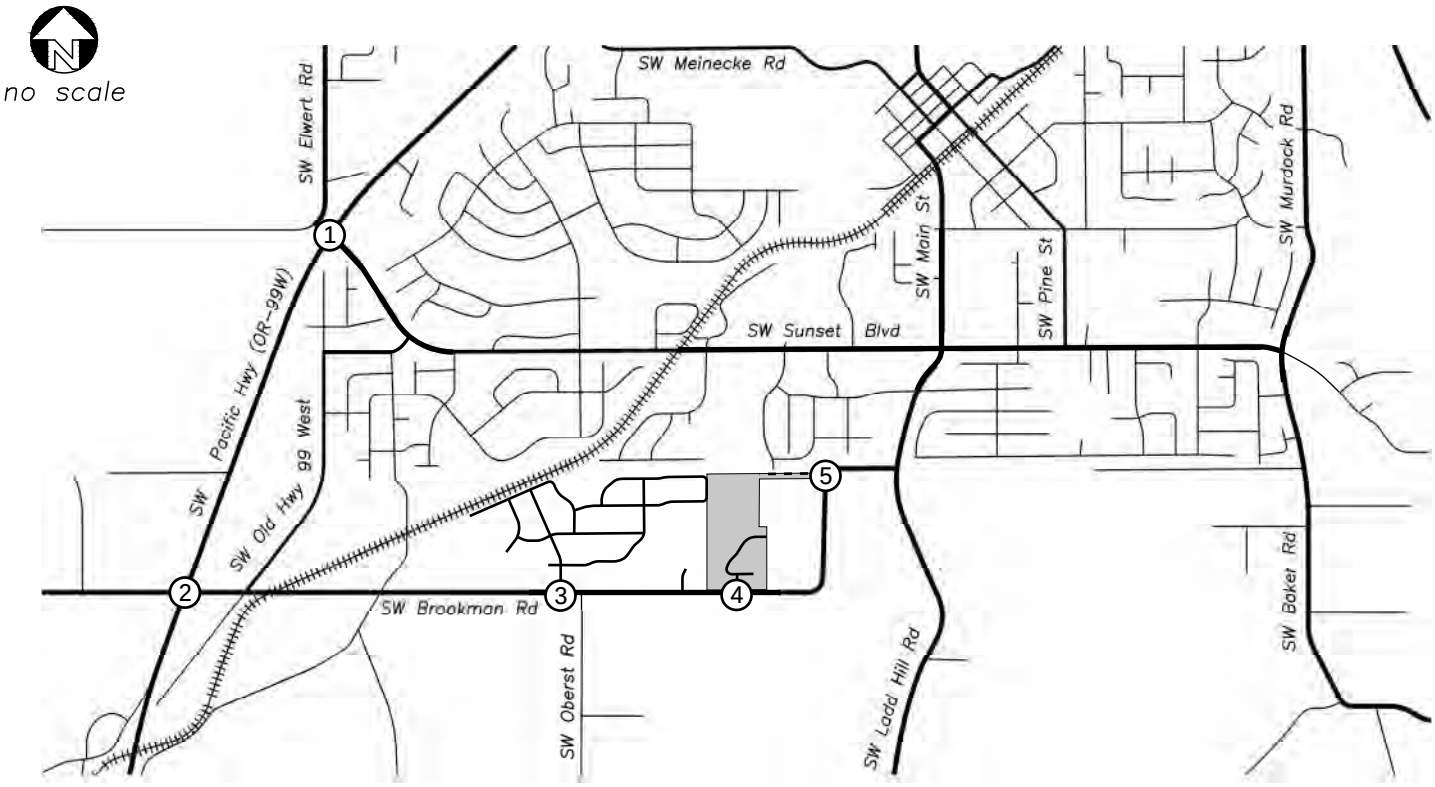
Note *The Reserve TIA* assumed additional turning movement restrictions at the intersection of SW Brookman Road at Highway 99W would be implemented by year 2024. The minor street approaches will be restricted to right-in/right-out only and U-turns along Highway 99W at the intersection would also be restricted. The volumes reflect this change.

Figure 6 shows the background traffic volumes at study intersections during the morning and evening peak hours.

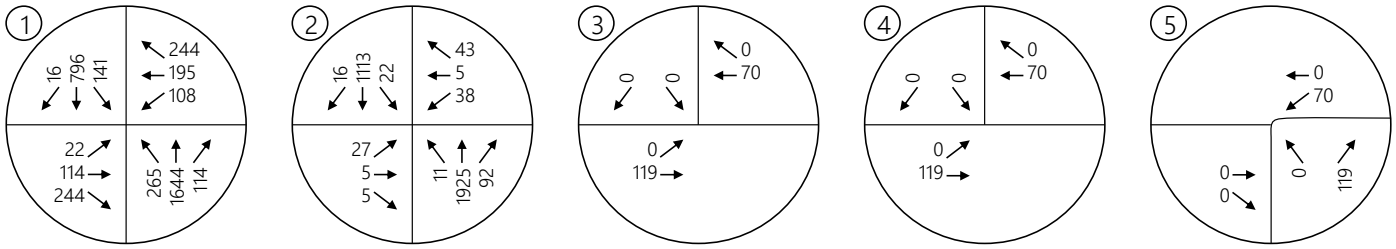
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2024 background traffic volumes to obtain the expected 2024 buildout volumes.

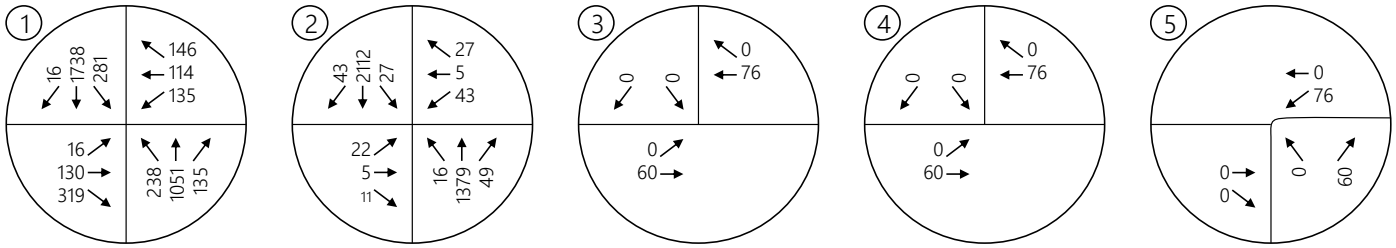
Figure 7 shows the buildout traffic volumes at study intersections during the morning and evening peak hours.



AM PEAK HOUR



PM PEAK HOUR

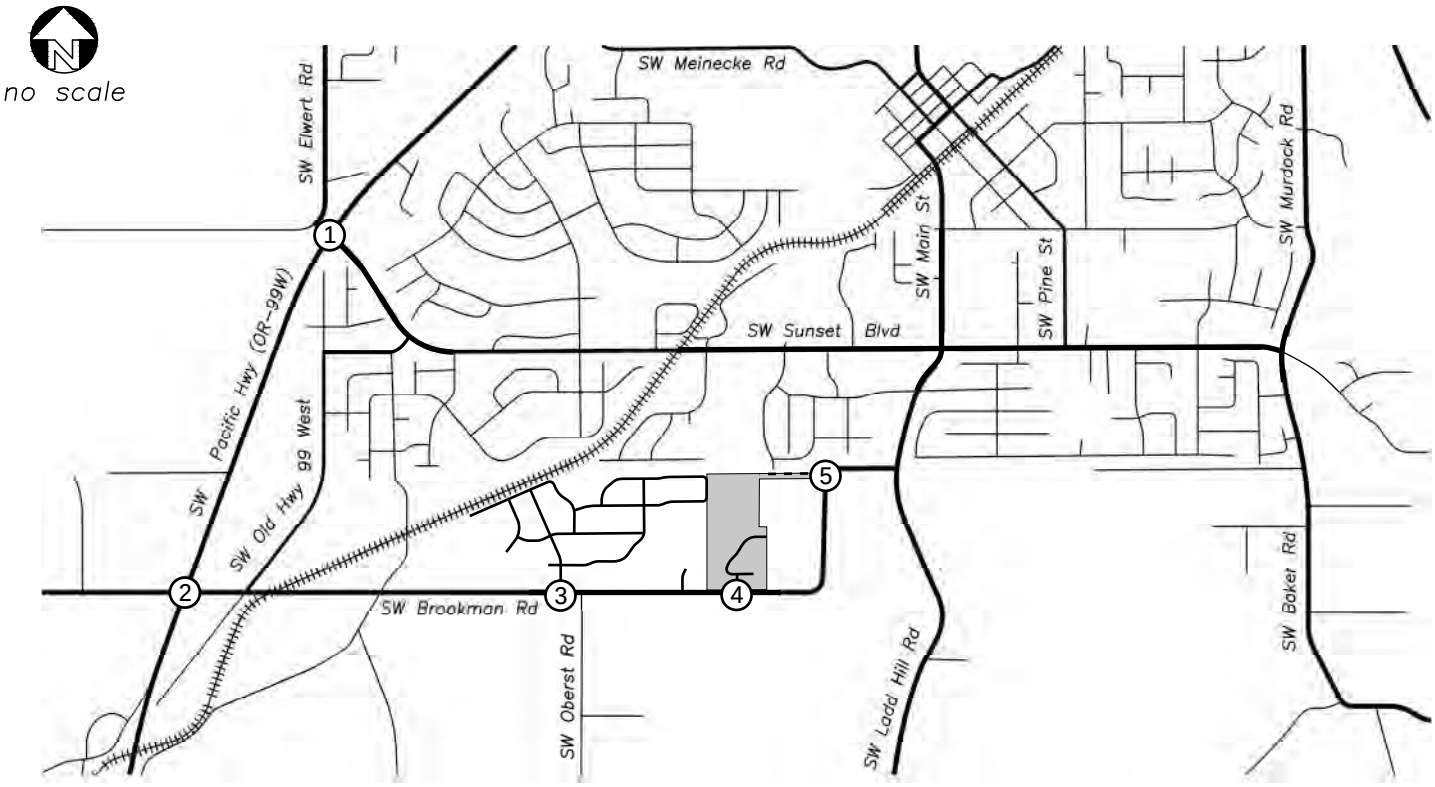


lancaster mobley

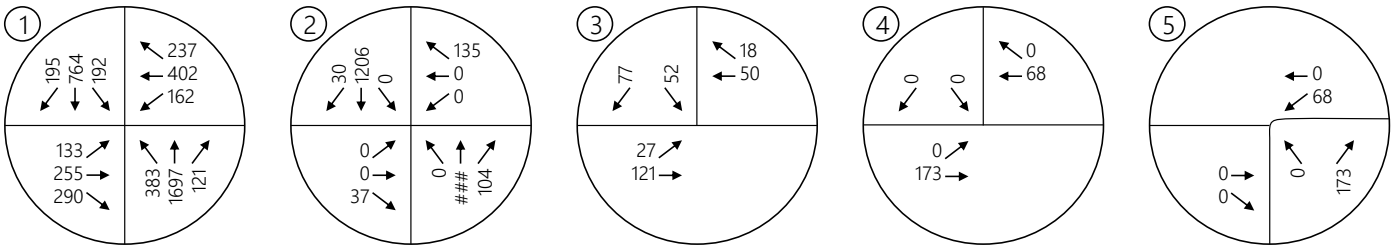
YEAR 2021 EXISTING CONDITIONS

TRAFFIC VOLUMES

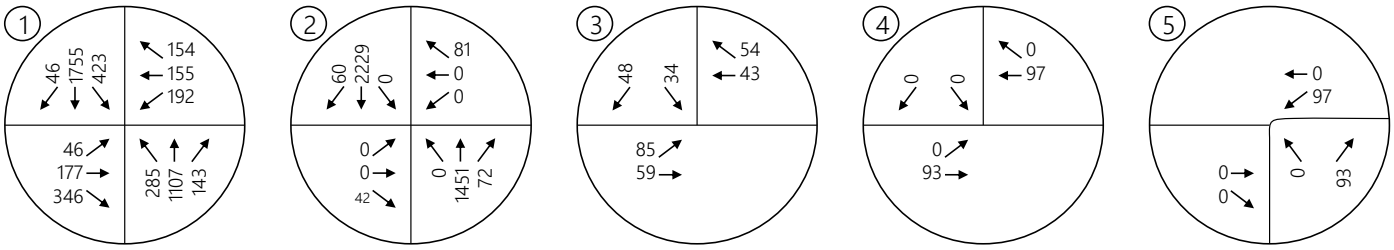
Figure 5
Cedar Creek Gardens
11/2/2021



AM PEAK HOUR



PM PEAK HOUR



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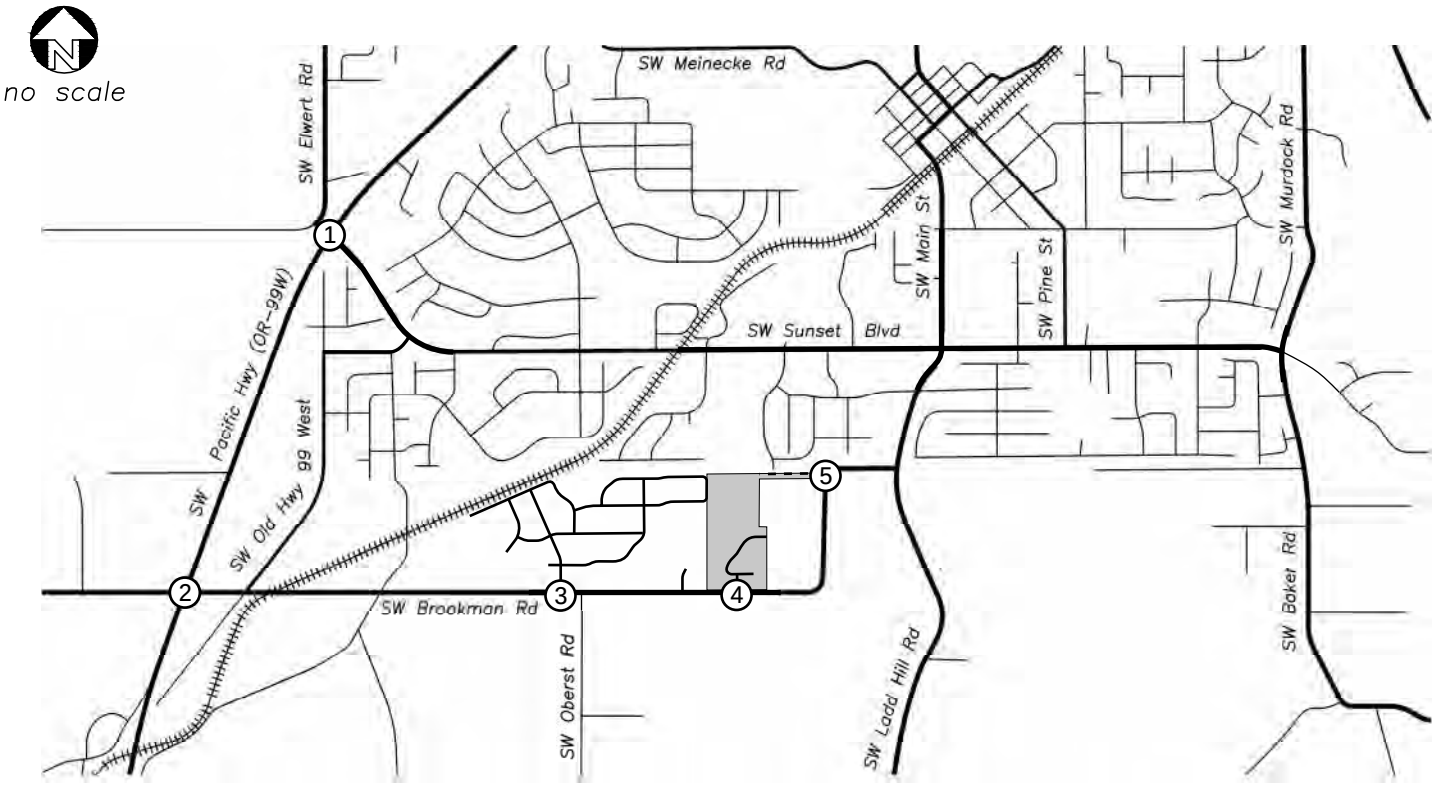
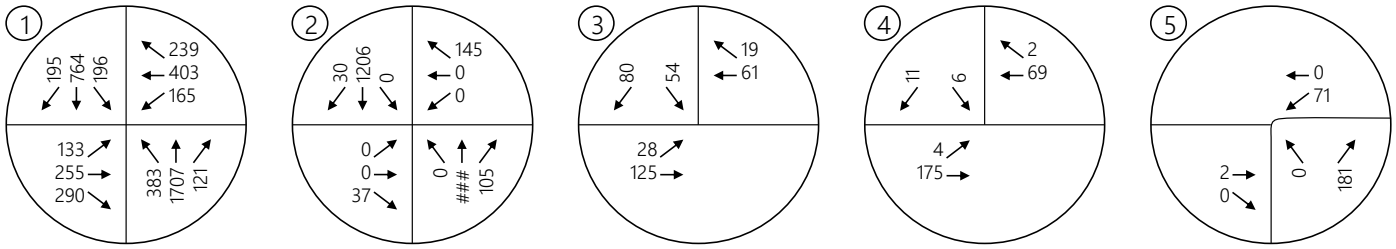
YEAR 2024 BACKGROUND CONDITIONS

TRAFFIC VOLUMES

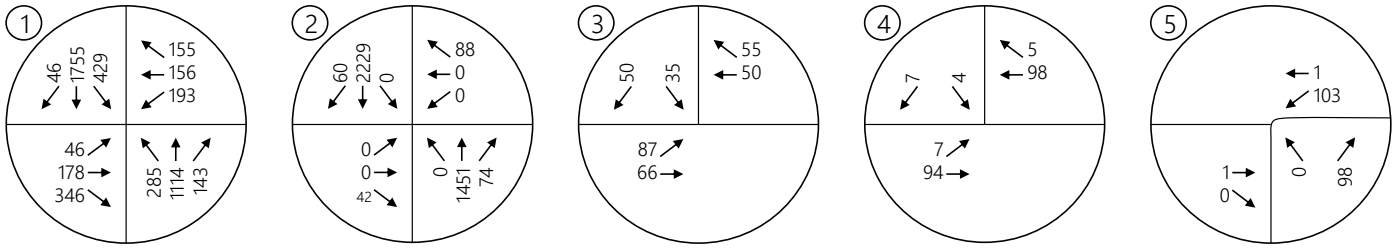
Figure 6
Cedar Creek Gardens
11/2/2021



AM PEAK HOUR



PM PEAK HOUR



lancaster mobley

YEAR 2024 BUILDOUT CONDITIONS

TRAFFIC VOLUMES

Figure 7
Cedar Creek Gardens
11/2/2021

Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2014 through December 2018) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- *PDO* – Property Damage Only;
- *Injury C* – Possible Injury;
- *Injury B* – Suspected Minor Injury;
- *Injury A* – Suspected Serious Injury; and
- *Fatality*

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents approximately 10 percent of the average daily traffic (ADT) at the intersection.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections. Detailed crash data is provided in the appendix to this report.

Table 4: Crash Type Summary

Intersection		Crash Type							Total Crashes
		Turn	Rear End	Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	SW Elwert Road/ SW Sunset Boulevard at Highway 99W	9	48	3	0	1	1	0	62
2	SW Brookman Rd at Highway 99W	8	2	17	1	1	0	0	29

Table 5: Crash Severity and Rate Summary

Intersection		Severity					Total Crashes	ADT	Crash Rate	ODOT 90th %
		PDO	C	B	A	Fatal				
1	SW Elwert Road/ SW Sunset Boulevard at Highway 99W	18	33	10	1	0	62	42,650	0.797	0.860
2	SW Brookman Rd at Highway 99W	14	6	8	1	0	29	37,000	0.429	0.860

Crash Severity

Two reported crashes were classified as *Injury A*:

- One rear-end collision occurred in 2019 between vehicles traveling northbound on Highway 99W at SW Elwert Road/SW Sunset Boulevard. The driver at fault was "following too closely."
- One angle collision occurred in 2015 on Highway 99W at SW Brookman Road. The crash involved a northbound motorcycle and a westbound passenger vehicle. The vehicle driver "did not yield right-of-way" to the motorcyclist who was seriously injured as a result of the collision.

Vulnerable Travelers

One turning collision reported in 2015 involved a southbound bicyclist traveling on the highway who was struck by a westbound passenger vehicles turning left from SW Sunset Boulevard onto the highway. The bicyclist was reported to have minor injuries (Injury B).

ODOT 90th Percentile Crash Rates

The study intersections adhere to the crash analysis methodologies within ODOT's Analysis Procedures Manual (APM). According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of their respective 90th percentile crash rates should be "flagged for further analysis". Crash rates in excess of 90th percentile crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

Intersection crash rates were calculated (Table 5); none have a rate above the respective ODOT 90th percentile crash rates.

ODOT Safety Priority Index System (SPIS)

The intersection of Highway 99W at SW Elwert Rd/SW Sunset Boulevard is reported in the worst 10 percent of intersections in ODOT's 2019 SPIS listing. No improvements are currently identified in the *2021-2024 Statewide Transportation Improvement Plan* that address this intersection.

Sight Distance Evaluation

A sight distance analysis was conducted at both the main site access and the shared driveway. To evaluate the sight distance available at these locations, intersection sight distance was measured in accordance with the current AASHTO manual[2]. According to AASHTO, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye-height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

AASHTO provides a recommendation for intersection sight distance (ISD) and a requirement for stopping sight distance (SSD). Intersection sight distance is an operational measure, intended to provide sufficient line of sight along the major street so that a driver could turn from the minor street with minimal impedance of traffic flow. Stopping sight distance is considered the minimum requirement to ensure safe operation of the roadway. Stopping sight distance allows an oncoming driver to see a hazard in the roadway, react, and come to a

[2] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.

complete stop if necessary to avoid a collision. As long as the available intersection sight distance is at least equal to the minimum required stopping sight distance for the design speed of the roadway, adequate sight distance is available for safe operation of the intersection.

A field investigation was conducted on Tuesday, November 2, 2021, to measure sight distance for this location. Figure 8 displays sight distance viewpoints from the future site accesses associated with the project. Due to existing vegetation, sight lines could not be viewed from 14.5 feet from the edge of the travel way.

Main Site Access

At the main site access on SW Brookman Road, the posted speed is 35 mph, but it transitions to 25 mph just east of the access. For the sight distance assessment, the speed of approaching vehicles was assumed to be 40 mph, which is 5 mph over the posted speed. At 40 mph, the recommended ISD is 445 feet and the required ISD is 305 feet.

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 445 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

Shared Driveway Access

At the shared driveway access on SW Brookman Road, the posted speed is 25 mph. For the sight distance assessment, the speed of approaching vehicles was assumed to be 25 mph due to the curvature of the roadway. At 25 mph, the recommended ISD is 280 feet and the required ISD is 155 feet.

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 280 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

A. Main Site Access Looking East

B. Main Site Access Looking West

C. Shared Driveway Looking East

D. Shared Driveway Looking South

Figure 8: Sight Line Photos at Future Site Accesses

Warrant Analysis

Left-turn lane warrants were examined for the site access intersection under year 2024 buildout conditions. A left-turn refuge is primarily a safety consideration for the major-street approach, removing left-turning vehicles from the through traffic stream.

Warrants for an eastbound left-turn lane at the site access intersection were based on the methodology outlined in the National Cooperative Highway Research Program (NCHRP) Report Number 457[3]. This methodology evaluates the need for a left-turn lane based on the number of left-turning vehicles, the number of travel lanes, the number of advancing and opposing vehicles, and the roadway travel speed.

Left-turn lane warrants are not projected to be met upon completion and occupancy of the proposed development. The detailed warrant analysis is included in the appendix.

[3] Bonneson, James A. and Michael D. Fontaine, *NCHRP Report 457: An Engineering Study Guide for Evaluating Intersection Improvements*, Transportation Research Board, 2001.

Operational Analysis

A capacity and delay analysis was conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual*[4] (HCM). Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates little, or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

The operating standards adopted by Washington County, ODOT, and the City of Sherwood are summarized below.

Washington County

SW Brookman Road is under the jurisdiction of Washington County. The County has defined operating standards for signalized and stop controlled intersections as follows:

- For signalized intersections, the maximum intersection v/c ratio shall be no greater than 0.99.
- For unsignalized intersections, no movement shall experience a v/c ratio greater than 0.99.

ODOT

ODOT operates and maintains Highway 99W. ODOT's operating mobility target for intersections along Highway 99W in the study area is an intersection v/c ratio no greater than 0.99 during the 1st and 2nd peak hours per Table 7 of the *Oregon Highway Plan*[5].

City of Sherwood

According to the City of Sherwood's Transportation System Plan (TSP), both signalized and unsignalized intersections under City jurisdiction must operate at LOS D or better with a v/c ratio of 0.85 or less; however, two-way stop-controlled intersections are required to operate at LOS E or better with a v/c ratio of 0.90 or less[6].

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6 for the morning and evening peak hours. Detailed calculations are included in the appendix.

[4] Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.
[5] Oregon Department of Transportation, *Oregon Highway Plan*. 1999
[6] City of Sherwood, *Sherwood Transportation System Plan*. Adopted June 17th, 2014.

Table 6: Capacity Analysis Summary

Intersection & Condition	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SW Elwert Road/SW Sunset Boulevard at Highway 99W						
2021 Existing Conditions	C	25	0.78	C	34	0.86
2024 Background Conditions	D	40	0.94	D	46	0.95
2024 Buildout Conditions	D	41	0.95	D	46	0.95
2. SW Brookman Road at Highway 99W						
2021 Existing Conditions	F	60	0.37	F	212	0.83
2024 Background Conditions	F	63	0.73	D	30	0.23
2024 Buildout Conditions	F	70	0.79	D	30	0.23
3. SW Brookman Road at Middlebrook Site Access						
2024 Background Conditions	B	11	0.24	B	11	0.17
2024 Buildout Conditions	B	11	0.25	B	11	0.18
4. SW Brookman Road at Main Sitrie Access						
2024 Buildout Conditions	A	10	0.03	A	10	0.02
5. SW Brookman Road at North Site Access						
2024 Buildout Conditions	B	11	0.01	B	10	0.01

BOLDED results indicate operation above acceptable jurisdictional standards.

As shown, all study intersections are projected to operate within agency standards under all analysis scenarios for all conditions. These results differ slightly from the conclusions in previous studies for the following reasons:

- At the intersection of SW Elwert Road/SW Sunset Boulevard at Highway 99W, the analysis outputs indicate that the eastbound shared through-right lane acts as a de facto right-turn lane and recommends recoding the lane to reflect the condition. When the approach is recoded to show a single through lane and a right-turn lane, operations improve measurably because the right-turn factor is only applied to one lane rather than two lanes.
- According to the APM software settings for signalized intersection analysis, "ODOT default for lost time is 4.0 seconds." Therefore, all lost times were adjusted appropriately following the procedures in the APM.

Based on the above analysis and findings, all study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.

As shown in Figure 7, the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both the morning and evening peak hours. Restriping the eastbound approach to provide a through and a right-turn lane could improve flow at the intersection because it would eliminate

occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping.

Proportionate Share Mitigation Assessment

Consistent with *The Reserve TIA*, proportionate share fees were calculated at intersections determined as failing, using methodologies similar to those presented in Table 6 of the referenced TIA. Table 7 provides the methodology used to calculate proportionate share fees based on the Cedar Creek Gardens trip assignment.

Table 7: Proportionate Share Methodolgy Summary

Intersection	A. SW Sunset Boulevard at SW Woodehaven Drive	B. SW Sunset Boulevard at SW Timbrel Lane	C. SW Sunset Boulevard at SW Main Street/SW Ladd Hill Road	D. SW Sunset`` Boulevard at SW Murdock Road/SW Baker Road
Mitigation Project Summary	Construct Traffic Signal	Construct Mini Roundabout	Construct Traffic Signal	Construct NB LTL & SB RTL
City TSP Project ID	NA	D28	D26	D33
Peak Hour	Weekday AM	Weekday AM	Weekday PM	Weekday PM
Scenario Triggering Mitigation	No Build (2024)	No Build (2024)	No Build (2024)	No Build (2024)
Existing Total Entering Volume, TEV (X)	1,012	894	1,208	1,208
2024 No Build (Background with RIRO, Y)	1,541	1,318	1,487	1,371
2024 Project Trips (PT)	10	10	10	6
Background Growth (Z=Y-X)	529	424	279	163
Proportional Share (%, PT/(PT+Z))	1.86%	2.30%	3.46%	3.55%
Mitigation Cost Estimate ($)	$1,050,000	$630,000	$250,000	$750,000
Cost Estimate Reference	DKS (Ref 10)	DKS (Ref 10)	TSP (Ref 5)	TSP (Ref 5)
Proportional Share Cost	$19,480.52	$14,516.13	$8,650.52	$26,627.22
Total	$69,274.39			

Based on the proportionate share fee calculations, a total proportionate share fee to mitigate site trip impacts to the above intersections is $69,274.39.

Conclusions

Key findings of this study include:

- No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
- A review of existing sight lines and elevation profiles from Google Earth show that adequate sight distance can be available if the roadside vegetation is cleared with the development. Both the intersection sight distance and stopping sight distance can be met at the main site access and the shared driveway.
- Left-turn lane warrants are not projected to be met at the site access intersection along SW Brookman Road upon completion and occupancy of the proposed development. Accordingly, installation of a left-turn lane at the site access intersection is not necessary or recommended.
- All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.
- Because the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both peak hours under all scenarios, agencies may wish to consider restriping the eastbound approach to provide a through and a right-turn lane. This change would eliminate occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping. The change is not necessary to accommodate the proposed development.
- *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019, identified four intersections as currently exceeding acceptable jurisdictional standards. Based on the projected site trip impacts to these intersections, a total proportionate share fee to mitigate impacts of $69,274.39 was calculated.

Appendix

- Site Plan
- Trip Generation
- Traffic Counts
- Reference Study Volumes
- In Process Trips
- Crash Data
- Sight Lines and Elevation Profiles
- Warrant Calculations
- Level of Service Definitions
- Operational Outputs

MATCHLINE - SEE THIS SHEET

"ARBOR LANE"

12.00' SHARED ACCESS EASEMENT FOR LOTS 40-42

EXISTING TRAIL

COMMUNITY TRAIL

100 YR FP

VC BOUNDARY

WETLAND BOUNDARY

40 6062 SF

41 10421 SF

42 10522 SF

SHARED DRIVEWAY

TRACT H OPEN SPACE 10660 SF

SW BROOKMAN ROAD

MATCHLINE - SEE THIS SHEET

WETLAND BOUNDARY

VC BOUNDARY

20.00' VACTOR TRUCK TURN AROUND EASEMENT

39 11033 SF

37 5017 SF

38 4884 SF

36 4656 SF

TRACT D OPEN SPACE 7947 SF

TRACT B OPEN SPACE

TRACT C STORM FACILITY 11167 SF

TRACT B OPEN SPACE 430014 SF

20.00' TRAIL EASEMENT

STREET B

STREET A

TRACT A STORM FACILITY 7320 SF

SW YAMEL TERRACE

15.00' PEDESTRIAN AND BICYCLE ACCESS EASEMENT

TRACT G PRIVATE ACCESSWAY

TRACT F

TRACT E

TRACT 'A'

1 4944 SF

2 5659 SF

3 7276 SF

4 6010 SF

5 5123 SF

6 5063 SF

7 5023 SF

8 5015 SF

9 6209 SF

10 5309 SF

11 5084 SF

12 5098 SF

13 5374 SF

14 5222 SF

15 5137 SF

16 5656 SF

17 5436 SF

18 5725 SF

19 5447 SF

20 5130 SF

21 5319 SF

22 5176 SF

23 4945 SF

24 4945 SF

25 4500 SF

26 4917 SF

27 4577 SF

28 4969 SF

29 4950 SF

30 4950 SF

31 5454 SF

32 5584 SF

33 7261 SF

34 5506 SF

35 5145 SF

SCALE
60 0 30 60
1 INCH = 60 FEET

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CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
PORTLAND, OREGON | HONOLULU, HAWAII
PH: 503.643.8286 PH: 808.753.2276
WWW.PD-GRP.COM

PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P3.0plat.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.0

B:\Projects\285-021-19\Planning\28521_P3.0plat.dwg 10/20/2021 12:27:11 PM

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 42

AM PEAK HOUR

Trip Equation: Ln(T)=0.91Ln(X)+0.120

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	9	25	34

PM PEAK HOUR

Trip Equation: Ln(T)=0.94Ln(X)+0.27

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	28	16	44

WEEKDAY

Trip Equation: Ln(T)=0.92Ln(X)+2.68

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	227	227	454

SATURDAY

Trip Equation: Ln(T)=0.97Ln(X)+2.4

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	207	207	414

Source: Trip Generation Manual, 11th Edition

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 2

AM PEAK HOUR

Trip Equation: Ln(T)=0.91Ln(X)+0.120

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	1	1	2

PM PEAK HOUR

Trip Equation: Ln(T)=0.94Ln(X)+0.27

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	2	1	3

WEEKDAY

Trip Equation: Ln(T)=0.92Ln(X)+2.68

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	14	14	28

SATURDAY

Trip Equation: Ln(T)=0.97Ln(X)+2.4

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	11	11	22

Source: Trip Generation Manual, 11th Edition

Type of peak hour being reported: Intersection Peak

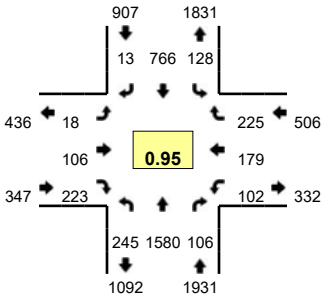
Method for determining peak hour: Total Entering Volume

LOCATION: SW Pacific Hwy -- SW Elwert Rd/SW Sunset Blvd

QC JOB #: 14401717

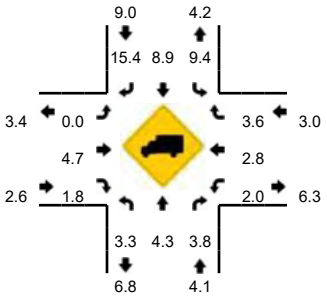
CITY/STATE: Sherwood, OR

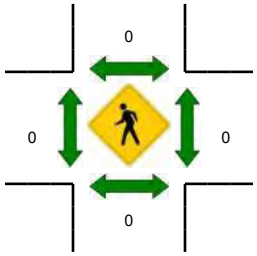
DATE: Thu, May 11 2017

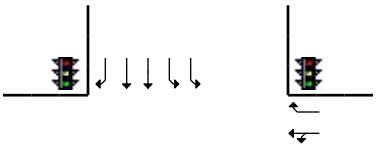


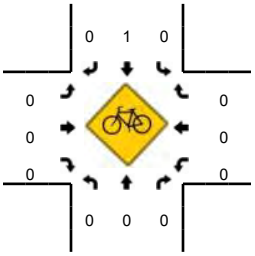
Peak-Hour: 7:05 AM -- 8:05 AM

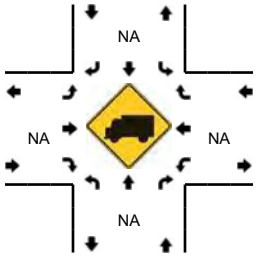
Peak 15-Min: 7:40 AM -- 7:55 AM

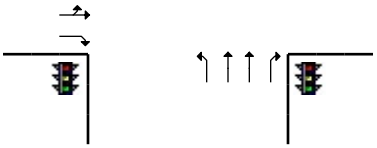


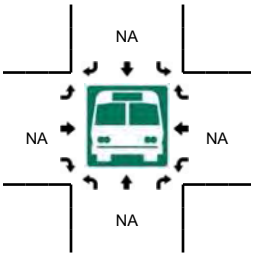












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Elwert Rd/SW Sunset Blvd (Eastbound)				SW Elwert Rd/SW Sunset Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	22	126	6	0	2	43	0	1	0	5	15	0	11	13	12	0	256	
7:05 AM	10	136	9	0	3	71	2	0	3	5	19	0	8	8	17	0	291	
7:10 AM	20	118	8	0	8	54	1	1	1	7	25	0	14	19	12	0	288	
7:15 AM	34	127	9	0	6	44	1	1	1	9	17	0	9	15	19	0	292	
7:20 AM	23	140	8	0	5	60	0	0	3	5	16	0	16	8	16	0	300	
7:25 AM	22	154	14	0	7	76	1	0	0	5	14	0	3	15	16	0	327	
7:30 AM	19	119	7	0	11	50	1	1	4	14	20	0	4	21	17	0	288	
7:35 AM	22	123	5	0	12	52	1	1	1	9	14	0	13	25	16	0	294	
7:40 AM	20	139	9	0	13	64	0	1	1	9	14	0	7	19	19	0	315	
7:45 AM	23	122	7	0	20	69	2	2	2	9	21	0	7	15	23	0	322	
7:50 AM	14	121	8	0	11	100	2	0	0	13	24	0	8	14	23	0	338	
7:55 AM	26	115	10	0	17	59	1	1	2	10	20	0	7	11	29	0	308	3619
8:00 AM	11	166	12	1	7	67	1	0	0	11	19	0	6	9	18	0	328	3691
8:05 AM	8	79	9	0	8	63	0	1	1	5	26	0	10	5	15	0	230	3630
8:10 AM	16	81	4	0	6	48	0	3	2	2	11	0	7	14	12	0	206	3548
8:15 AM	12	133	6	0	6	83	0	1	1	4	12	0	5	7	12	0	282	3538
8:20 AM	23	98	8	0	6	40	0	4	0	6	16	0	7	8	7	0	223	3461
8:25 AM	11	110	9	0	6	55	0	2	2	2	19	0	7	8	9	0	240	3374
8:30 AM	16	76	5	0	13	51	0	3	0	3	10	0	7	6	14	0	204	3290
8:35 AM	17	128	7	0	7	66	2	1	1	8	13	0	5	9	11	0	275	3271
8:40 AM	9	112	11	0	9	62	1	1	1	3	10	0	3	4	3	0	229	3185
8:45 AM	8	93	8	0	7	60	0	0	1	4	10	0	11	8	17	0	227	3090
8:50 AM	9	96	11	0	3	59	0	1	1	7	23	0	7	6	12	0	235	2987
8:55 AM	9	86	6	0	8	74	1	3	1	8	8	0	5	3	11	0	223	2902

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	228	1528	96	0	176	932	16	12	12	124	236	0	88	192	260	0	3900
Heavy Trucks	12	68	4		12	60	4		0	4	0		0	4	16		184
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

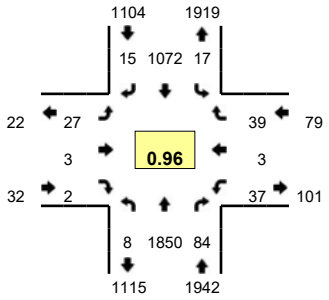
Report generated on 5/19/2017 4:01 PM

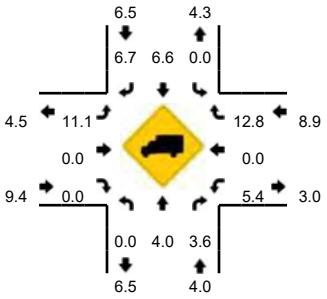
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

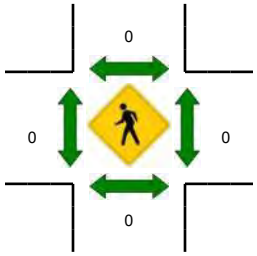
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

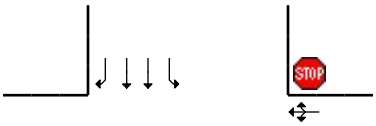
LOCATION: SW Pacific Hwy -- SW Chapman Rd | **QC JOB #:** 14401706
CITY/STATE: Sherwood, OR | **DATE:** Thu, May 11 2017

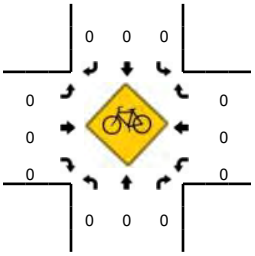
Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

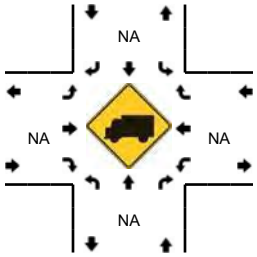


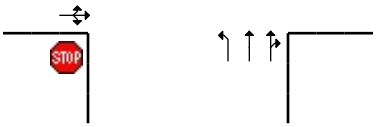


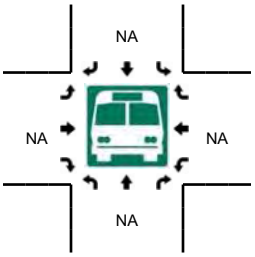












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Chapman Rd (Eastbound)				SW Chapman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	133	2	0	0	74	0	0	1	0	0	0	4	0	3	0	217	
7:05 AM	0	169	5	1	0	81	4	0	0	0	0	0	2	0	0	0	262	
7:10 AM	0	159	6	0	0	99	1	1	1	0	0	0	1	0	1	0	269	
7:15 AM	1	165	11	0	1	75	0	0	0	1	0	0	2	0	2	0	258	
7:20 AM	0	174	7	0	0	100	0	1	1	1	0	0	3	0	1	0	288	
7:25 AM	0	141	8	1	1	78	1	0	3	0	0	0	4	0	2	0	239	
7:30 AM	0	177	8	0	1	84	0	0	4	0	1	0	0	1	4	0	280	
7:35 AM	0	177	8	0	0	85	1	0	0	0	0	0	4	0	3	0	278	
7:40 AM	1	147	14	1	1	85	1	0	4	0	0	0	3	1	5	0	263	
7:45 AM	1	142	9	0	4	99	2	0	3	0	0	0	2	0	4	0	266	
7:50 AM	0	147	6	0	1	125	1	1	2	0	0	0	4	1	3	0	291	
7:55 AM	1	133	1	0	3	82	2	0	1	1	1	0	8	0	6	0	239	3150
8:00 AM	0	119	1	1	2	79	2	0	8	0	0	0	4	0	8	0	224	3157
8:05 AM	0	98	4	0	2	85	4	0	5	0	0	0	2	1	1	0	202	3097
8:10 AM	0	127	2	0	1	82	1	0	0	1	0	0	3	0	1	0	218	3046
8:15 AM	0	130	3	0	2	72	2	0	3	0	1	0	2	0	2	0	217	3005
8:20 AM	1	135	6	0	1	89	1	1	0	1	0	0	3	0	2	0	240	2957
8:25 AM	0	115	5	0	3	63	0	0	0	0	0	0	0	0	1	0	187	2905
8:30 AM	0	127	3	0	1	71	0	0	1	0	0	0	3	1	3	0	210	2835
8:35 AM	0	118	3	0	1	83	2	0	2	0	0	0	0	1	1	0	211	2768
8:40 AM	1	143	0	1	1	68	2	1	1	0	0	0	3	0	0	0	221	2726
8:45 AM	0	108	1	0	1	87	4	1	0	1	0	0	3	0	2	0	208	2668
8:50 AM	1	127	3	0	0	88	1	0	0	1	1	0	1	0	1	0	224	2601
8:55 AM	0	93	4	0	1	89	3	0	2	1	1	0	3	1	1	0	199	2561

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	2004	120	4	8	1016	8	0	32	0	4	0	28	8	48	0	3284
Heavy Trucks	0	64	4		0	100	0		0	0	0		4	0	4		176
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

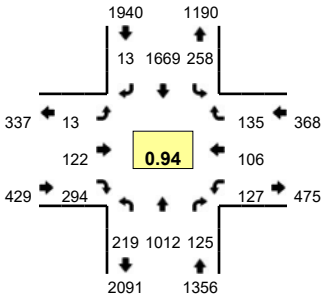
Report generated on 5/19/2017 4:01 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

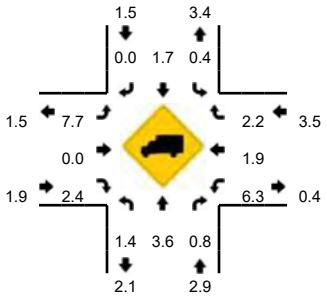
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

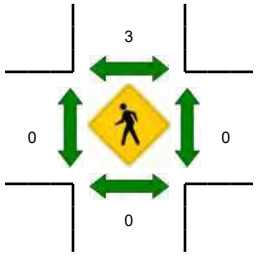
LOCATION: SW Pacific Hwy -- SW Elwert Rd/SW Sunset Blvd | **QC JOB #:** 14401718

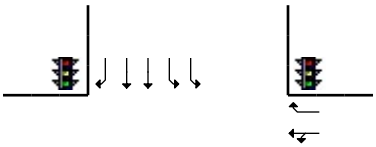
CITY/STATE: Sherwood, OR | **DATE:** Thu, May 11 2017

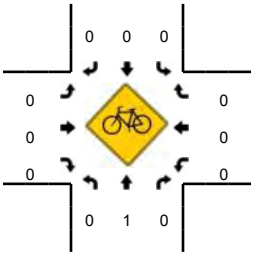
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

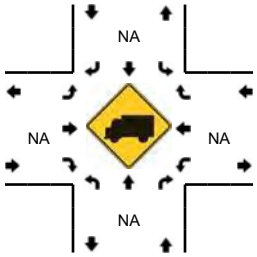


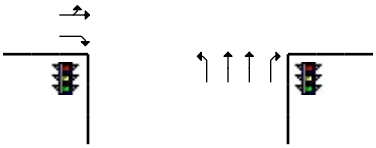


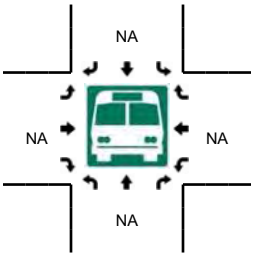












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Elwert Rd/SW Sunset Blvd (Eastbound)				SW Elwert Rd/SW Sunset Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	15	71	6	1	11	141	3	4	3	11	27	0	10	6	6	0	315	
4:05 PM	4	62	14	0	14	154	0	1	0	12	26	0	7	5	11	0	310	
4:10 PM	12	76	3	0	11	132	0	2	0	10	27	0	9	8	10	0	300	
4:15 PM	13	96	13	1	10	111	3	3	1	7	25	0	11	8	15	0	317	
4:20 PM	16	91	13	1	13	149	0	5	0	12	18	0	13	7	11	0	349	
4:25 PM	13	82	5	0	12	140	2	3	1	9	21	0	12	10	16	0	326	
4:30 PM	22	73	10	0	12	110	3	2	0	11	28	0	6	7	11	0	295	
4:35 PM	16	82	8	0	19	121	2	6	0	11	26	0	10	8	11	0	320	
4:40 PM	24	100	17	1	13	129	1	2	0	7	29	0	12	8	9	0	352	
4:45 PM	23	79	9	0	19	136	0	3	1	7	22	0	11	19	15	0	344	
4:50 PM	22	87	11	0	22	124	1	3	2	12	27	0	11	10	12	0	344	
4:55 PM	14	78	16	0	25	136	1	1	2	6	28	0	12	8	18	0	345	3917
5:00 PM	19	77	8	0	10	117	0	5	2	11	29	0	9	11	10	0	308	3910
5:05 PM	13	63	8	0	16	153	2	2	0	12	22	0	17	6	16	0	330	3930
5:10 PM	16	80	9	0	22	158	0	0	1	13	23	0	13	4	10	0	349	3979
5:15 PM	15	95	17	0	14	157	2	2	5	7	22	0	11	10	8	0	365	4027
5:20 PM	14	108	4	0	25	154	1	4	0	12	22	0	12	9	12	0	377	4055
5:25 PM	22	75	7	0	16	142	1	5	0	13	24	0	6	8	7	0	326	4055
5:30 PM	21	93	11	0	25	110	2	1	0	9	27	0	7	6	11	0	323	4083
5:35 PM	15	77	8	0	21	153	2	2	0	13	19	0	6	7	7	0	330	4093
5:40 PM	17	89	9	0	21	131	0	7	0	10	25	0	4	8	8	0	329	4070
5:45 PM	17	88	13	0	8	136	3	1	1	5	26	0	7	8	11	0	324	4050
5:50 PM	19	87	15	0	22	134	0	3	1	11	25	0	10	5	11	0	343	4049
5:55 PM	17	64	8	0	31	134	4	2	0	12	15	0	11	6	11	0	315	4019

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	180	1132	120	0	244	1876	12	24	24	128	268	0	144	92	120	0	4364
Heavy Trucks	8	40	4		0	20	0		4	0	8		8	0	0		92
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

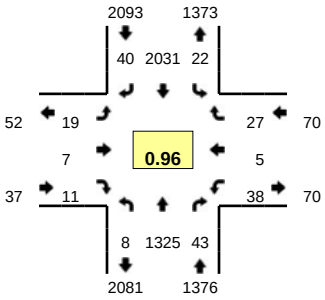
Method for determining peak hour: Total Entering Volume

LOCATION: SW Pacific Hwy -- SW Chapman Rd

QC JOB #: 14401707

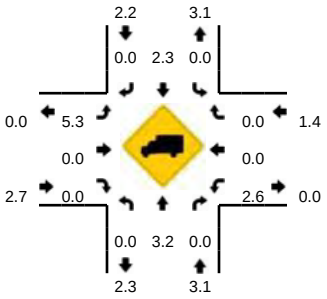
CITY/STATE: Sherwood, OR

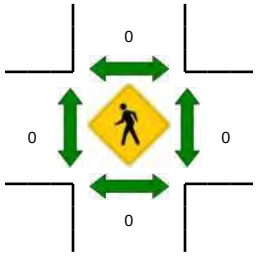
DATE: Thu, May 11 2017

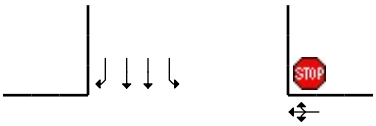


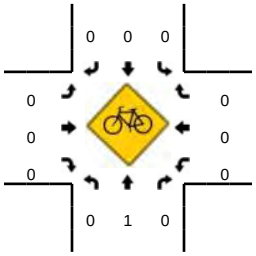
Peak-Hour: 4:35 PM -- 5:35 PM

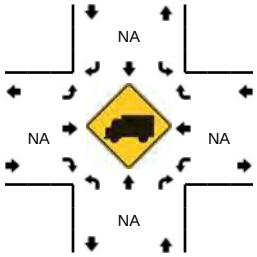
Peak 15-Min: 5:10 PM -- 5:25 PM

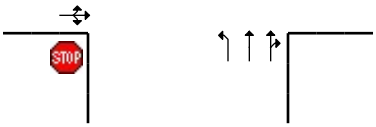


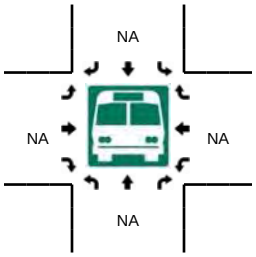












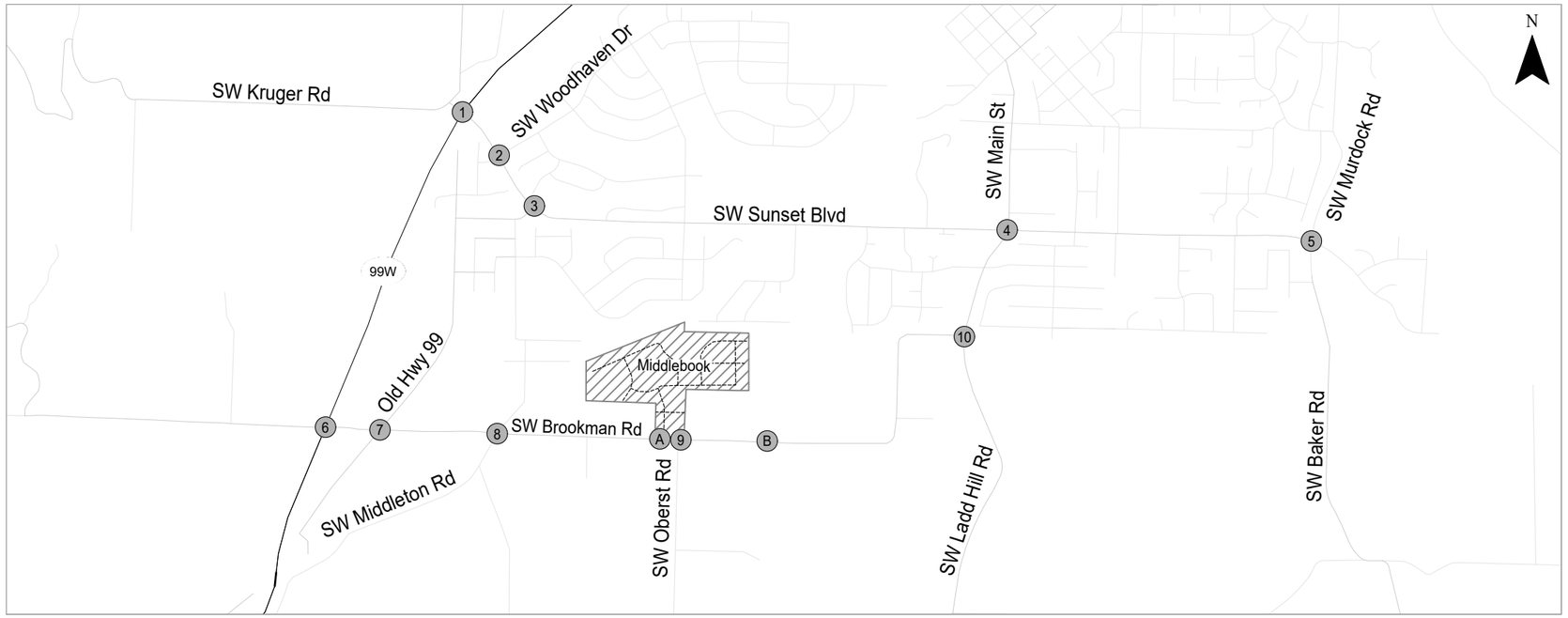
5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Chapman Rd (Eastbound)				SW Chapman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	89	1	0	1	184	2	0	1	1	0	0	2	0	0	0	281	
4:05 PM	0	72	6	1	0	166	3	0	0	0	1	0	5	0	0	0	254	
4:10 PM	1	103	2	1	1	160	1	0	1	0	1	0	3	0	1	0	275	
4:15 PM	0	126	4	0	1	163	4	0	4	0	0	0	4	0	2	0	308	
4:20 PM	0	124	1	0	1	153	1	0	1	0	0	0	4	0	0	0	285	
4:25 PM	1	92	5	0	1	172	4	0	1	0	0	0	4	0	2	0	282	
4:30 PM	1	102	2	0	3	149	0	0	0	0	0	0	4	0	2	0	263	
4:35 PM	2	114	0	0	1	153	3	0	2	2	0	0	1	0	4	0	282	
4:40 PM	0	117	2	0	3	149	4	0	5	1	3	0	6	0	4	0	294	
4:45 PM	0	108	2	0	0	176	3	0	3	1	1	0	3	0	5	0	302	
4:50 PM	0	117	5	0	2	177	4	0	0	1	1	0	4	1	1	0	313	
4:55 PM	2	121	3	0	1	173	5	0	0	0	1	0	1	0	3	0	310	3449
5:00 PM	0	102	6	0	4	159	1	1	0	0	2	0	3	0	1	0	279	3447
5:05 PM	0	91	2	0	2	183	3	0	1	0	1	0	0	1	0	0	284	3477
5:10 PM	0	110	6	0	4	187	2	1	4	0	0	0	5	0	1	0	320	3522
5:15 PM	2	119	3	0	1	189	5	0	0	1	1	0	2	1	1	0	325	3539
5:20 PM	1	107	1	1	0	161	3	0	2	0	0	0	6	0	5	0	287	3541
5:25 PM	0	114	6	0	2	177	5	0	1	0	1	0	4	0	0	0	310	3569
5:30 PM	0	105	7	0	0	147	2	0	1	1	0	0	3	2	2	0	270	3576
5:35 PM	0	100	0	0	1	164	2	1	1	0	1	0	4	1	2	0	277	3571
5:40 PM	0	132	4	0	0	156	2	0	1	0	1	0	0	0	1	0	297	3574
5:45 PM	0	114	4	0	0	149	1	0	4	0	0	0	5	0	2	0	279	3551
5:50 PM	0	93	3	0	3	158	1	0	0	4	0	0	5	1	1	0	269	3507
5:55 PM	0	82	3	0	2	151	0	0	1	2	0	0	5	0	1	0	247	3444

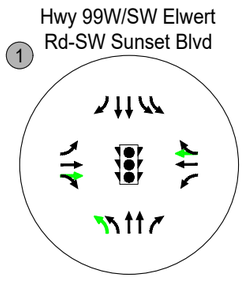
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	1344	40	4	20	2148	40	4	24	4	4	0	52	4	28	0	3728
Heavy Trucks	0	44	0		0	40	0		0	0	0		0	0	0		84
Pedestrians		0				0				0				0			0
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

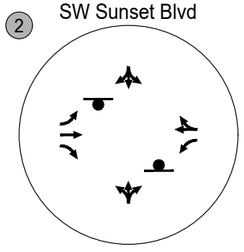
Comments:

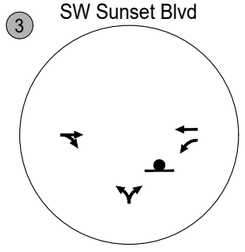
Report generated on 5/19/2017 4:01 PM

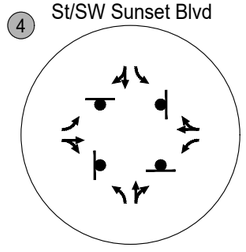
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

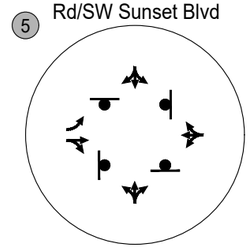


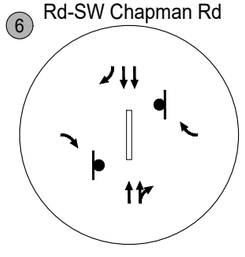


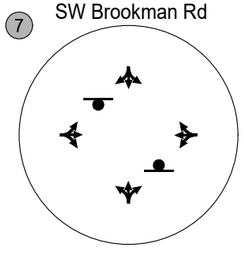


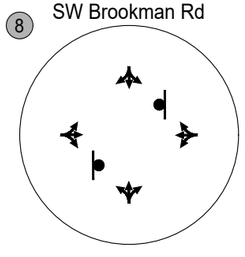


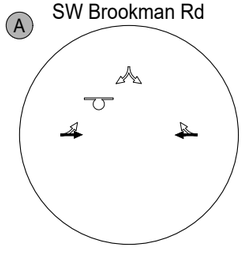


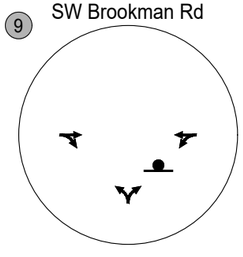


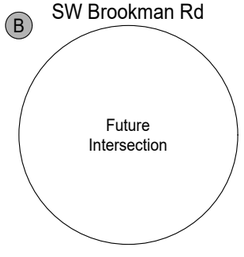


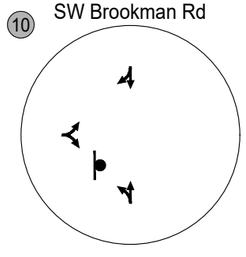








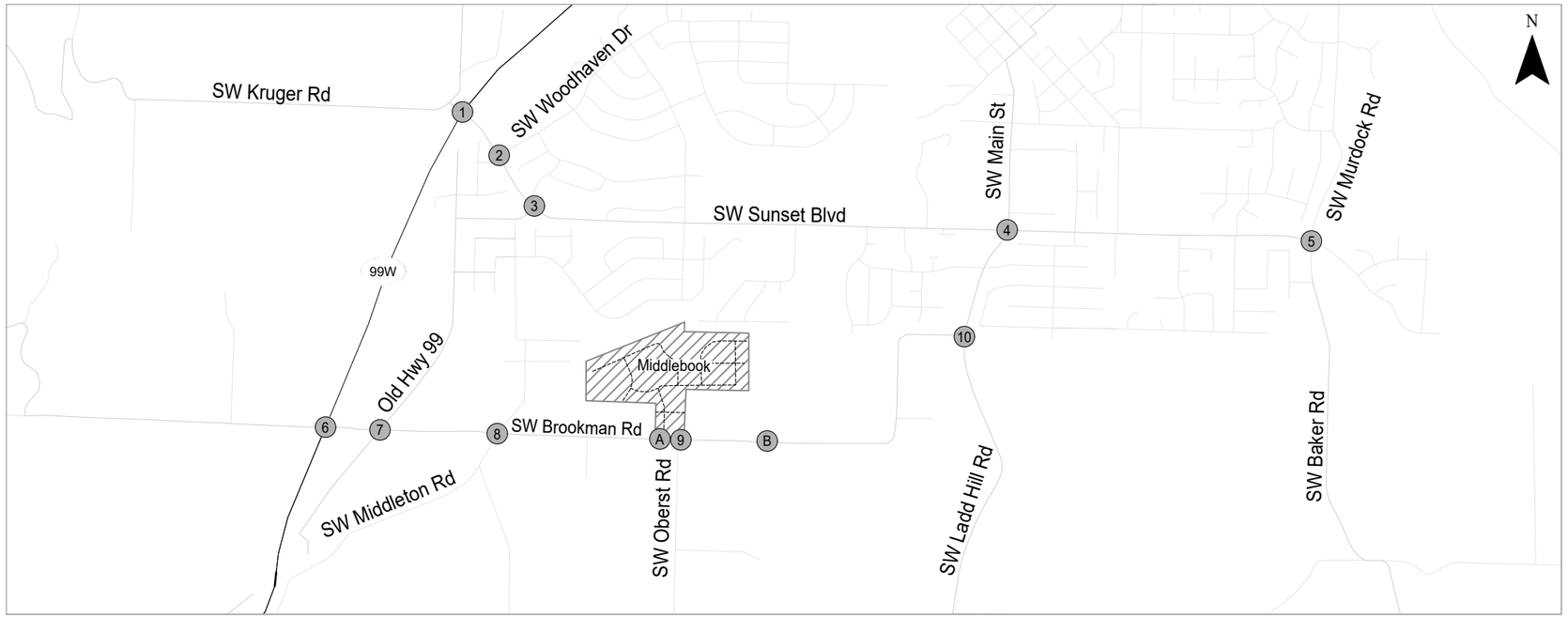




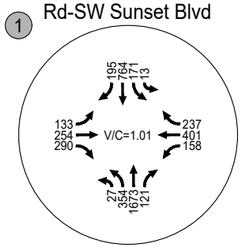
- STOP SIGN
- TRAFFIC SIGNAL
- RAISED MEDIAN
- EXISTING
- PLANNED IMPROVEMENT
- MOVEMENT/IMPROVEMENT ADDED WITH MIDDLEBROOK DEVELOPMENT

Year 2024 Background Assumed Lane Configurations and Traffic Control Devices
Sherwood, Oregon

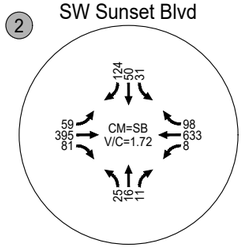
Figure 6



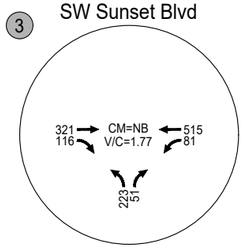
Hwy 99W/SW Elwert Rd-SW Sunset Blvd



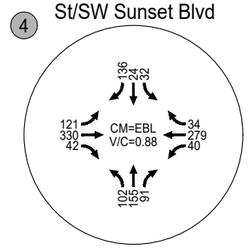
SW Woodhaven Dr/ SW Sunset Blvd



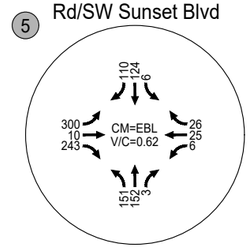
SW Timbrel Ln/ SW Sunset Blvd



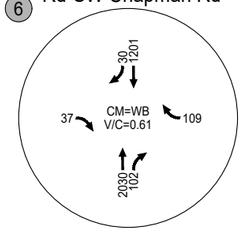
SW Ladd Hill Rd-SW Main St/SW Sunset Blvd



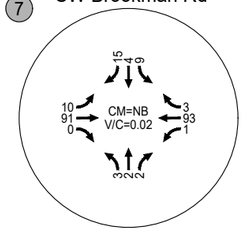
SW Baker Rd-SW Murdock Rd/SW Sunset Blvd



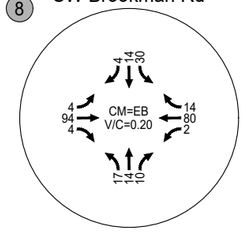
Hwy 99W/SW Brookman Rd-SW Chapman Rd



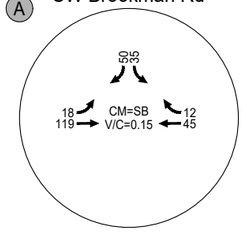
Old Hwy 99W/ SW Brookman Rd



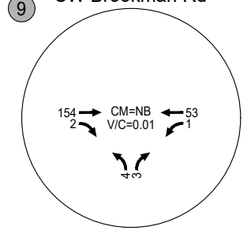
SW Middleton Rd/ SW Brookman Rd



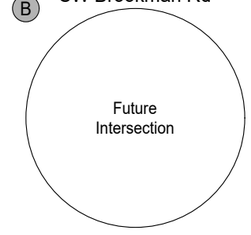
Middlebrook Access/ SW Brookman Rd



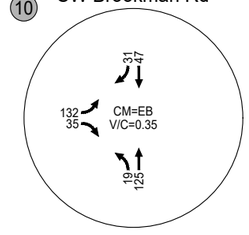
SW Oberst Rd/ SW Brookman Rd



The Reserve Access/ SW Brookman Rd



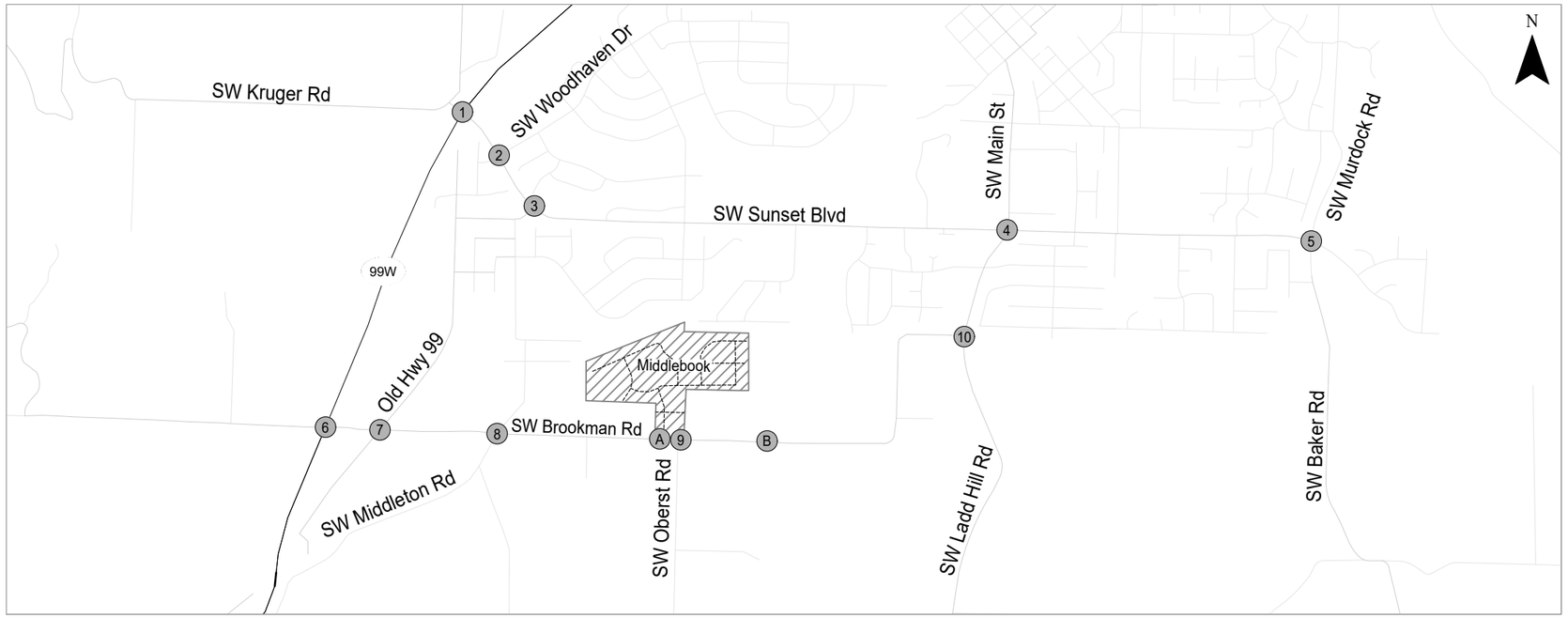
SW Ladd Hill Rd/ SW Brookman Rd



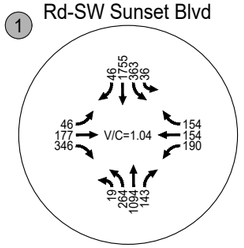
CM = CRITICAL MOVEMENT (TWSC)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
TWSC = TWO-WAY STOP CONTROL
AWSC= ALL-WAY STOP CONTROL

Year 2024 Background Intersection Operations Weekday AM Peak Hour Sherwood, Oregon

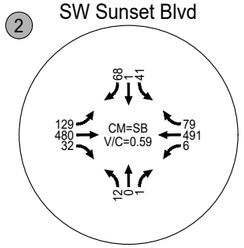
Figure 7



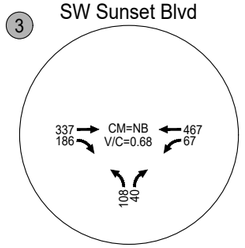
Hwy 99W/SW Elwert Rd-SW Sunset Blvd



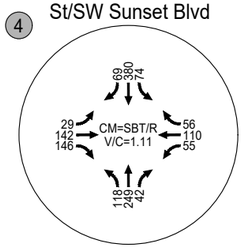
SW Woodhaven Dr/ SW Sunset Blvd



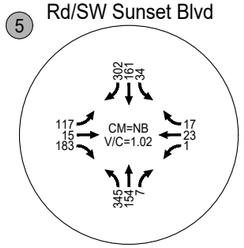
SW Timbrel Ln/ SW Sunset Blvd



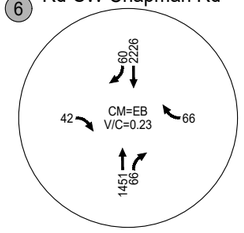
SW Ladd Hill Rd-SW Main St/SW Sunset Blvd



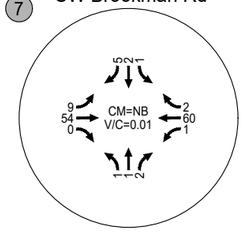
SW Baker Rd-SW Murdock Rd/SW Sunset Blvd



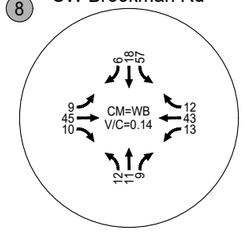
Hwy 99W/SW Brookman Rd-SW Chapman Rd



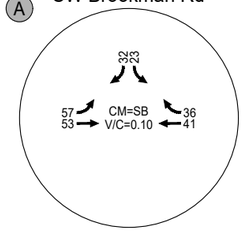
Old Hwy 99W/ SW Brookman Rd



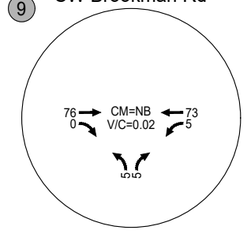
SW Middleton Rd/ SW Brookman Rd



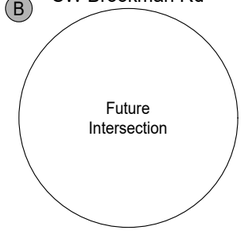
Middlebrook Access/ SW Brookman Rd



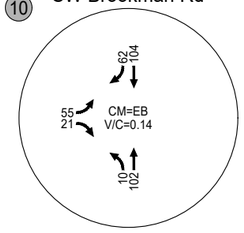
SW Oberst Rd/ SW Brookman Rd



The Reserve Access/ SW Brookman Rd



SW Ladd Hill Rd/ SW Brookman Rd



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TWSC = TWO-WAY STOP CONTROL
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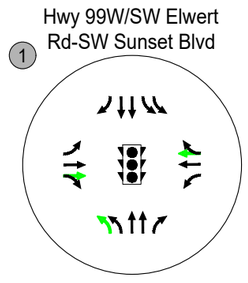
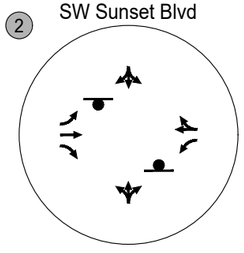
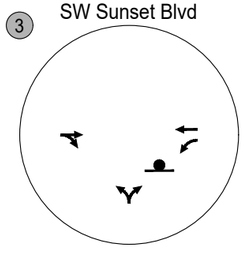
Year 2024 Background Intersection Operations
Weekday PM Peak Hour
Sherwood, Oregon

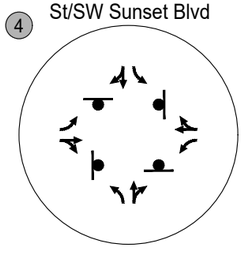
Figure 8

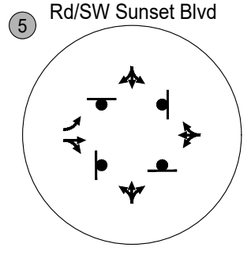
KITTELSON & ASSOCIATES

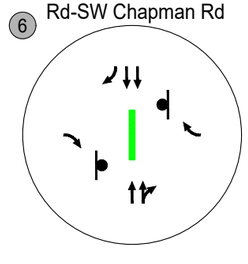


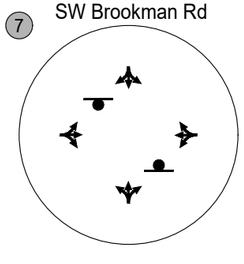


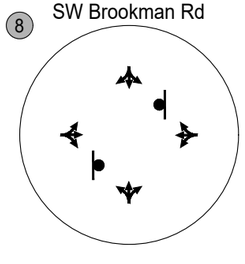


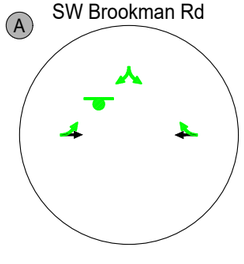


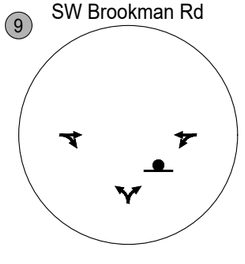


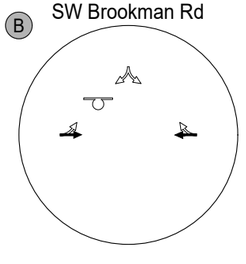


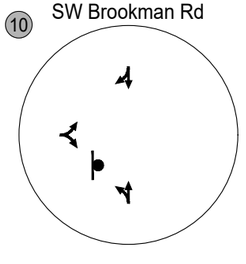










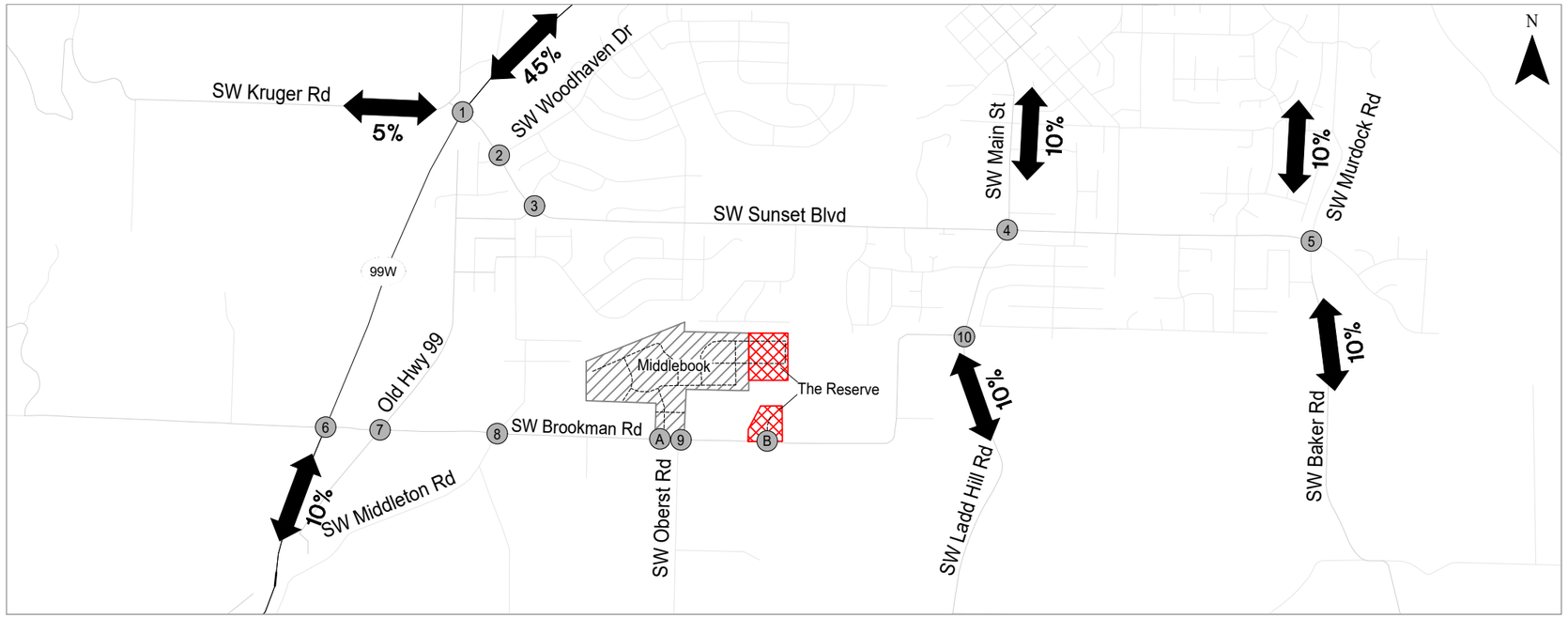


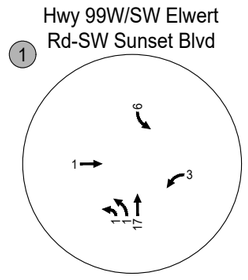
- STOP SIGN
- TRAFFIC SIGNAL
- RAISED MEDIAN
- EXISTING
- PLANNED IMPROVEMENT
- MOVEMENT ADDED WITH THE RESERVE DEVELOPMENT

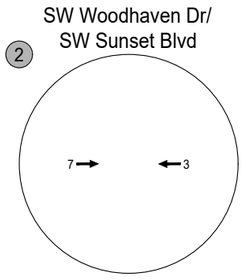
Year 2024 Background Assumed Lane Configurations and Traffic Control Devices
Sherwood, Oregon

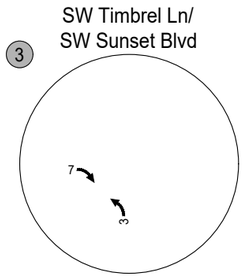
Figure 9

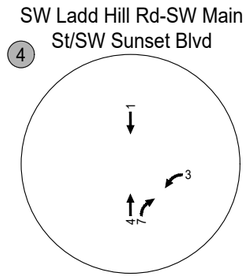
KITTELSON & ASSOCIATES

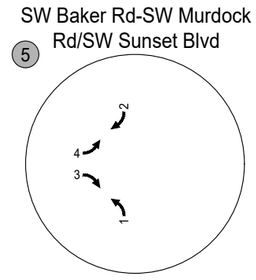


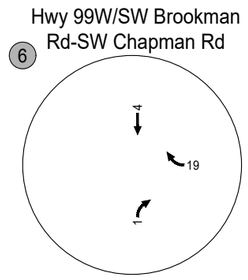


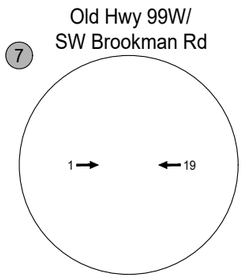


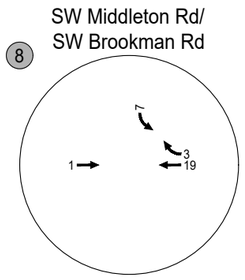


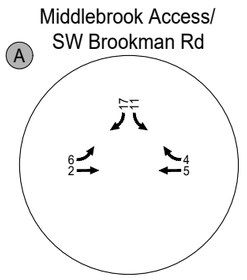


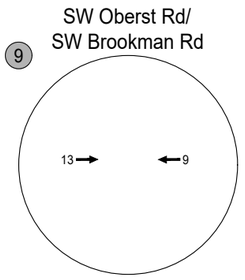


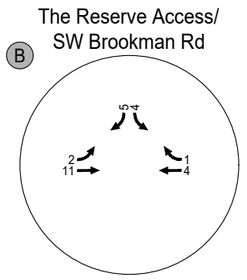


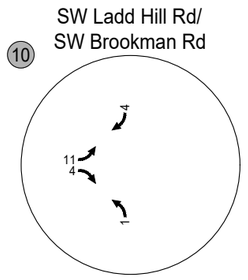






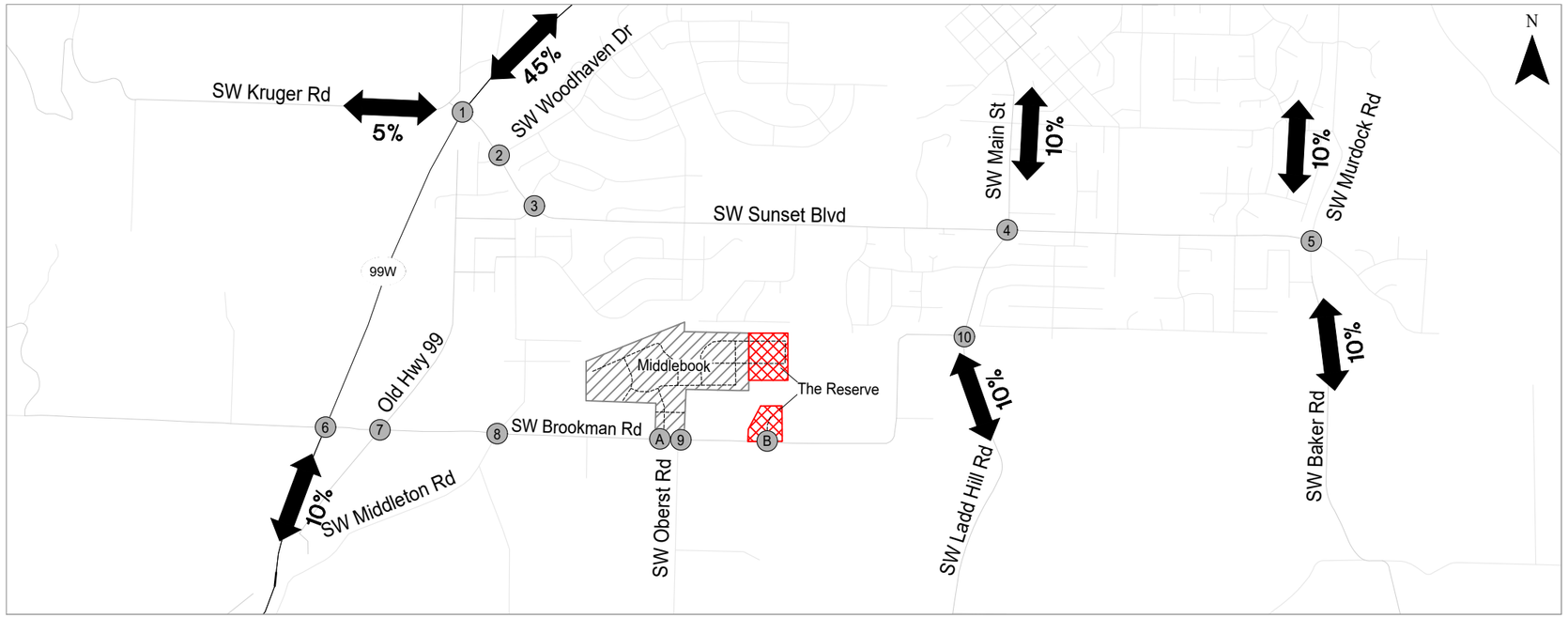


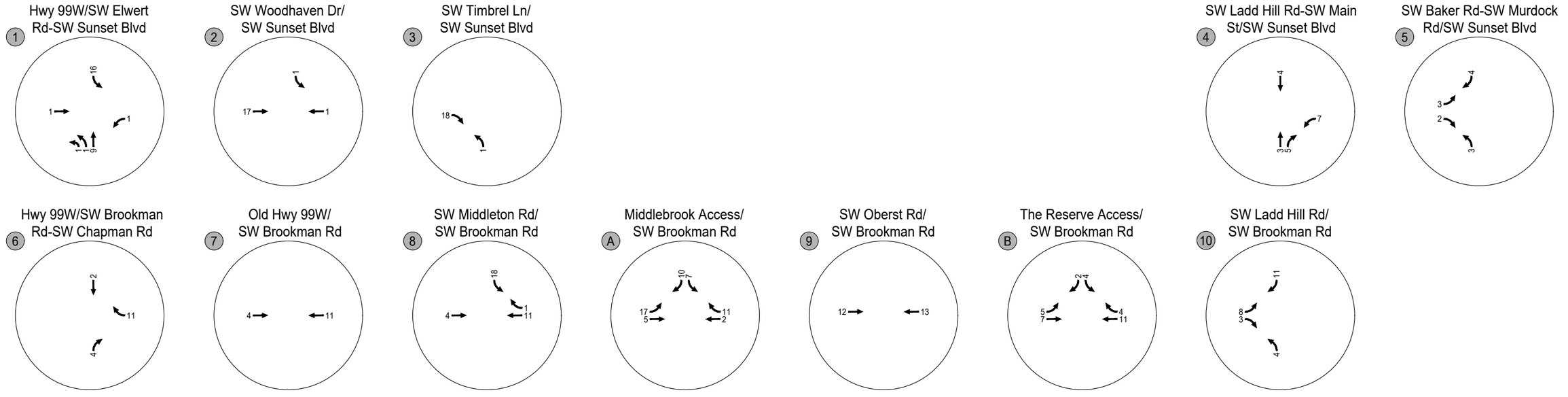




Assumed Trip Distribution and Assignment with RIRO at Highway 99W/SW Brookman Road-SW Chapman Road
Weekday AM Peak Hour
Sherwood, Oregon

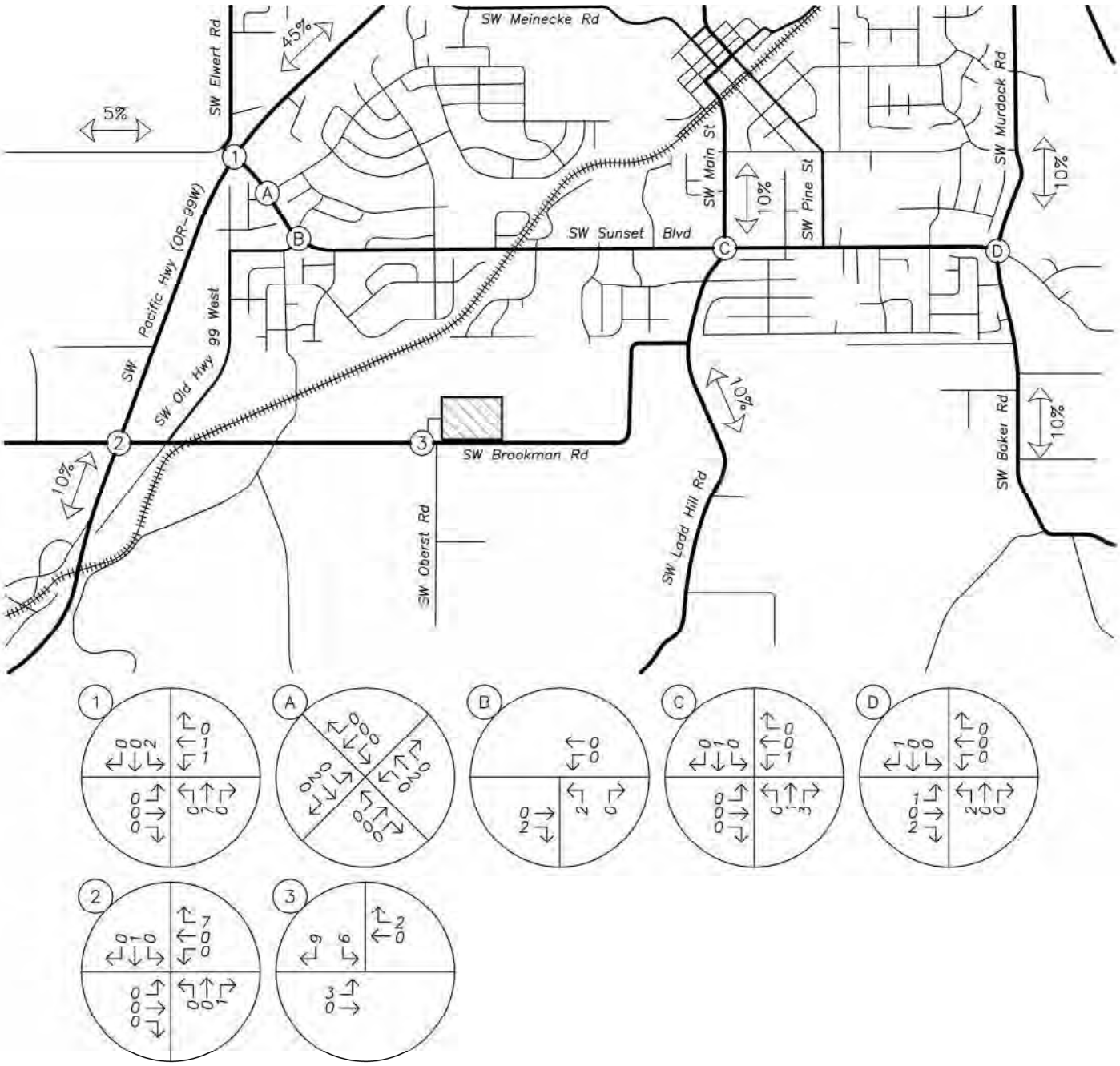
Figure
10





Assumed Trip Distribution and Assignment with RIRO at Highway 99W/SW Brookman Road-SW Chapman Road
Weekday PM Peak Hour
Sherwood, Oregon

Figure 11



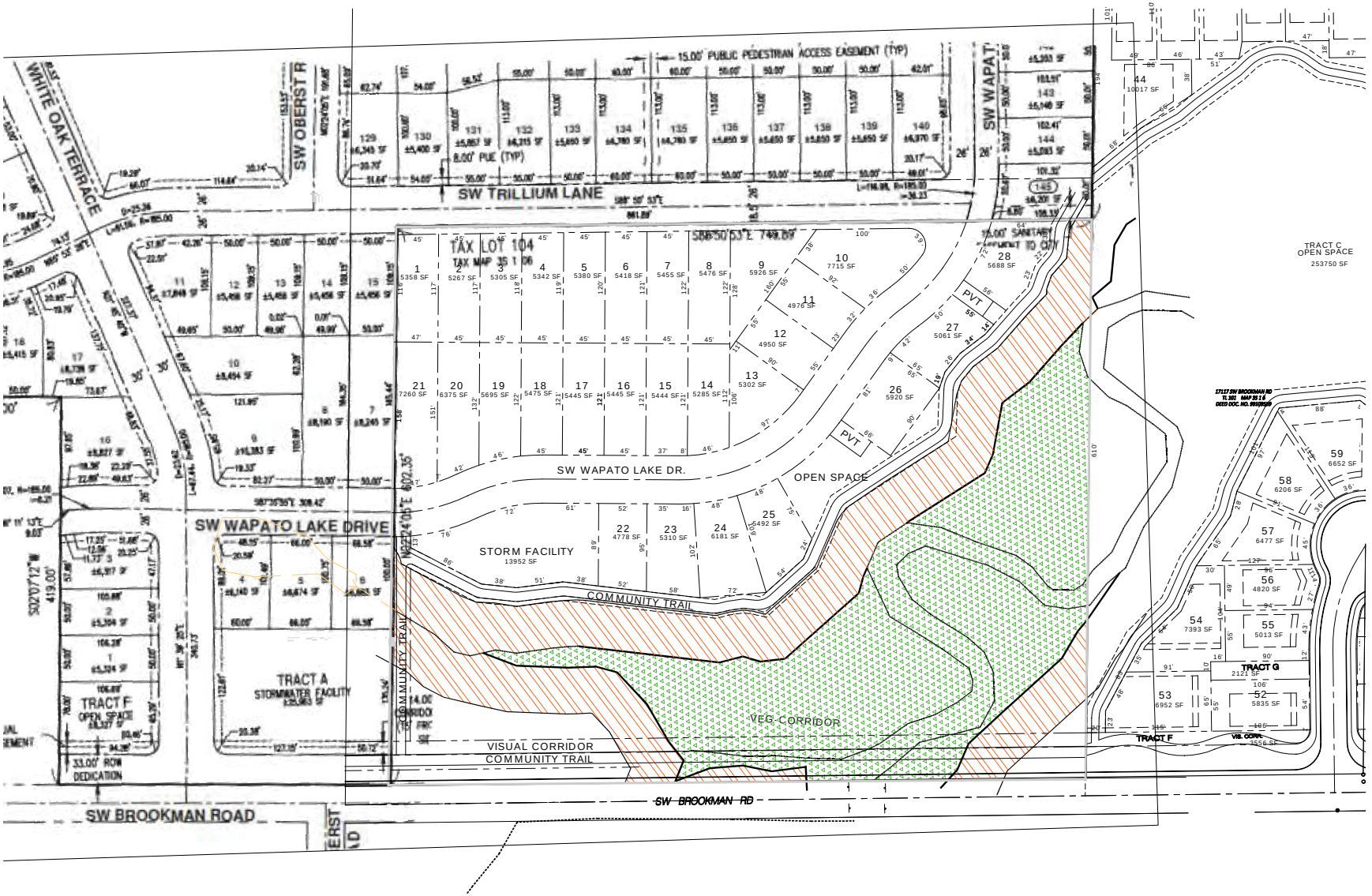
no scale

lancaster mobley

SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM Peak Hour

Figure 2
Cedar Creek Subdivision
3/31/2020



TVWD FILE #?????
WACO CASEFILE # ??-???-?

PIONEER DESIGN GROUP
9450 SW GEMINI DR. #PDX-0000 | BEAVERTON, OREGON 97008-7105
PORTLAND | OREGON | HONOLULU, HAWAII
PH: 503.643.3626
WWW.PIO-GRP.COM

PRELIMINARY SITE PLAN

SCOTT PROPERTY
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	10/19
Drawn by	TCC	Date	10/19
Reviewed by	MLS	Date	10/19
Project No.	131-999	REF.	
Horiz. Scale:	1"=50'		
Vert. Scale:			

No.	Date	Revision	By

Project: SCOTT PROPERTY
No. 131-999
Type: PLANNING
Sheet: P0.0

B:\Projects\131-999\Brookman Road\Scott Property\P2.dwg 10/10/2019 3:58:51 PM

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 16.55 to 16.75 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

1 - 4 of 63 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J N V	S I H L	C N R K	O W	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02154	N	N	N	N	N	N	N	05/01/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY								WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	NONE	N	DRY	REAR		PRVTE	NE-SW									000		00
N								5P	PORTLAND UA	16.57		SW ELWERT RD	03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		043	000		07
N								45 21 16.15	-122 51 59.28			009100100S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW									011		00
																				PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		000	000		00
																											OR<25					
08211	N	N	N	N				11/30/2016	WASHINGTON	1 14			STRGHT		N	N	RAIN	S-1STOP	01	NONE 9	STRGHT											29
NONE								WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		N/A	NE-SW									000		00
N								3P	PORTLAND UA	16.60		SW SUNSET BLVD	03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 14.96	-122 52 .91			009100100S00		(04)													UNK					
																			02	NONE 9	STOP											
																				N/A	NE-SW									011		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
04096	N	N	N	N	N	N		08/12/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY								MO	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000		00
N								4P	PORTLAND UA	16.60		SW ELWERT RD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		043	000		07
N								45 21 14.96	-122 52 .91			009100100S00		(04)													OR>25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW									011		00
																				PSNGR CAR		01	DRVR	INJC	36	F	OR-Y		000	000		00
																											OR<25					
07960	N	N	N	N				12/22/2015	WASHINGTON	1 14			STRGHT		N	N	RAIN	S-1STOP	01	NONE 1	STRGHT											29
NO RPT								TU	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	NE-SW									000		00
N								4P	PORTLAND UA	16.61		SW ELWERT RD	04			N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	72	M	OR-Y		026	000		29
N								45 21 14.53	-122 52 1.4			009100100S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW									011		00
																				PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW									011		00
																				PSNGR CAR		02	PSNG	INJC	65	M			000	000		00
03457	N	N	N	N				06/21/2015	WASHINGTON	1 14			STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE								SU	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000		00
N								6P	PORTLAND UA	16.64		SW SUNSET BLVD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		042	000		29
N								45 21 13.21	-122 52 2.83			009100100S00		(04)													OR>25					

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 16.55 to 16.75 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

5 - 9 of 63 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J G N	S I H V	W C R L	O K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	INJC	18	F	OR-Y OR<25		000	006 000		00 00
04458	N	N	N N		08/06/2015	WASHINGTON	1 14		STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT												29
NONE					TH	SHERWOOD	MN 0	SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW											000		00
N					6P	PORTLAND UA	16.64	SW SUNSET BLVD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000		29
N					45 21 13.21	-122 52 2.83		009100100S00		(04)															UNK				
																	02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	30	F	OR-Y OR<25		000	011 000		00 00
03929	N	N	N N		06/15/2016	WASHINGTON	1 14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT												13
NONE					WE	SHERWOOD	MN 0	SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	SS-O		N/A	NE-SW											000		00
N					3P	PORTLAND UA	16.64	SW ELWERT RD	04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N					45 21 13.21	-122 52 2.83		009100100S00		(04)															UNK				
																	02	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00
03493	N	N	N N		05/28/2016	WASHINGTON	1 14		STRGHT		Y	N	CLR	S-STRGHT	01	NONE 9	STRGHT												29
NONE					SA	SHERWOOD	MN 0	SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	NE-SW											000		00
N					11A	PORTLAND UA	16.65	SW SUNSET BLVD	03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N					45 21 12.76	-122 52 3.29		009100100S00		(04)															UNK				
																	02	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00
80504	N	N	N N		05/17/2018	WASHINGTON	1 14		STRGHT		Y	N	CLR	S-1STOP	01	NONE 0	STRGHT												29
NONE					TH	SHERWOOD	MN 0	SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW											006		00
N					4P	PORTLAND UA	16.65	SW SUNSET BLVD	03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		026	000		29
N					45 21 12.75	-122 52 3.29		009100100S00		(04)															OR<25				
																	02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	32	M	OR-Y OR<25		000	011 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	02	PSNG	INJC	31	M			000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U	M J / G	S / N	W / H	O / R / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
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NONE								MO	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000		00
N								3P	PORTLAND UA	16.65		SW SUNSET BLVD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		026	000		29
N								45 21 12.76	-122 52 3.29			009100100S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW								011		00
																				PSNGR CAR		01	DRVR	INJC	60	F	OR-Y		000	000		00
																											OR<25					
00684	N	N	N	N	N	N		02/08/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
CITY								TH	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		UNKN	NE-SW									000		00
N								6P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		026	000		29
N								45 21 11.85	-122 52 4.18			009100100S00															UNK					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW								011		00
																				PSNGR CAR		01	DRVR	INJC	49	F	OR-Y		000	000		00
																											OR<25					
02155	N	N	N	N	N	N	N	04/30/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT											07
CITY								MO	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000		00
N								5P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 11.85	-122 52 4.18			009100100S00															UNK					
																			02	NONE 9	STOP											
																				N/A	NE-SW								011		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
07290	N	N	N	N				12/19/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT											07
CITY								WE	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000		00
N								4P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 11.85	-122 52 4.18			009100100S00															UNK					
																			02	NONE 9	STOP											
																				N/A	NE-SW								011		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
00764	N	N	N	N				02/13/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE								WE	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000		00
N								2P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 11.85	-122 52 4.18			009100100S00															UNK					
																			02	NONE 9	STOP											
																				N/A	NE-SW								011		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 16.55 to 16.75 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

15 - 18 of 63 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A L C	D R / U G S	M J / N I V	S C / N H L	W O / R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04035	N	N	N	N	N	N	08/08/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	TURN-L										29
CITY							TH	SHERWOOD	MN 0		SW ELWERT RD	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NW								000		00
N							3P	PORTLAND UA	16.67		SW PACIFIC HY 99W	05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		026	000		29
N							45 21 11.85	-122 52 4.18			009100100S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NW								011		00
																			PSNGR CAR		01	DRVR	INJC	38	M	OR-Y		000	000		00
																										OR<25				
																		02	NONE 0	STOP										
																			PRVTE	SW-NW								011		00
																			PSNGR CAR		02	PSNG	INJB	43	F			000	000		00
05867	N	N	N	N			10/28/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-STP	01	NONE 9	TURN-R										08
NONE							SU	SHERWOOD	MN 0		SW ELWERT RD	NW		TRF SIGNAL	N	WET	TURN		N/A	NW-SE								000		00
N							UNK	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00															UNK					
																		02	NONE 9	STOP										
																			N/A	NW-SE								012		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
00404	N	N	N	N	N	N	01/23/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
COUNTY							FR		MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S								000		00
N							6A	PORTLAND UA	16.67			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		020	000		04
N							45 21 11.85	-122 52 4.18			009100100S00															OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	S -W								000		00
																			PSNGR CAR		01	DRVR	INJC	29	M	OR-Y		000	000		00
																										OR>25				
03342	N	N	N	N	N	N	06/06/2017	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L									087	27,04
CITY							TU		MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -W								000		00
N							2P	PORTLAND UA	16.67			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	21	M	OR-Y		016,004,020	038		27,04
N							45 21 11.85	-122 52 4.18			009100100S00															OR>25					
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		01	DRVR	INJC	25	F	OR-Y		000	000		00
																										OR<25				
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		02	PSNG	NO<5	01	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		03	PSNG	NO<5	02	F			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U G / S	M J / N I / V	S C / H	W O / R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02588	N	N	N	N	N	N	05/23/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
CITY						WE	SHERWOOD	MN 0	SW ELWERT RD		CN		TRF SIGNAL	N	N	DRY	TURN		PRVTE	NE-SW								000		00
N						5A	PORTLAND UA	16.67	SW PACIFIC HY 99W		01	0		N	N	DAWN	INJ		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		000	000		00
N						45 21 11.85	-122 52 4.18		009100100S00																	OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	SW-NW								000		00
																			PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		020	000		04
																										OR<25				
05940	N	N	N	N	N	N	11/03/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT										013	02,29
CITY						SA	SHERWOOD	MN 0	SW ELWERT RD		CN		L-GRN-SIG	N	N	WET	TURN		PRVTE	NE-SW								022	013	00
N						8P	PORTLAND UA	16.67	SW PACIFIC HY 99W		01	0		N	N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	55	F	SUSP		000	000		00
N						45 21 11.84	-122 52 4.18		009100100S00																	OR<25				
																		02	NONE 0	TURN-L										
																			PRVTE	SW-NW								022		00
																			TRUCK		01	DRVR	NONE	35	M	OR-Y		004,028	000		02
																										OR<25				
																		03	NONE 0	STRGHT										
																			PRVTE	NE-SW								000		00
																			PSNGR CAR		01	DRVR	NONE	24	F	SUSP N-RES		026	000		29
06954	N	N	N	N	N	N	12/18/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	TURN-L										04
CITY						TU		MN 0			CN		L-GRN-SIG	N	N	WET	TURN		PRVTE	SW-NW								000		00
N						2P	PORTLAND UA	16.67			01	0		N	N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	22	F	OR-Y		020,004	000		04
N						45 21 11.85	-122 52 4.19		009100100S00																	OR<25				
																		02	NONE 0	STRGHT										
																			PRVTE	NE-SW								000		00
																			PSNGR CAR		01	DRVR	INJB	56	F	OR-Y		000	000		00
																										OR<25				
05733	N	N	N	N	N	N	10/26/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 9	STRGHT										04
CITY						FR	SHERWOOD	MN 0	SW ELWERT RD		CN		TRF SIGNAL	N	N	WET	TURN		N/A	NE-SW								000		00
N						1P	PORTLAND UA	16.67	SW PACIFIC HY 99W		01	0		N	N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 21 11.85	-122 52 4.18		009100100S00																	UNK				
																		02	NONE 9	TURN-L										
																			N/A	SW-NW								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
03825	N	N	N	N			07/08/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	BIKE	01	NONE 0	TURN-L										02
NONE						WE		MN 0			CN		TRF SIGNAL	N	N	DRY	TURN		PRVTE	SE-SW								000		00
N						7P	PORTLAND UA	16.67			03	0		N	N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	F	OTH-Y		027	000		02
N						45 21 11.85	-122 52 4.18		009100100S00																	OR<25				
																				-										
																				STRGHT	01	BIKE	INJB	23	M		I INRD	000	035		00
																				NW SE										

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 16.55 to 16.75 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

24 - 28 of 63 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P / E L / D C	A	D R / U	M J / G N / S V	S / I H / C L	W / O R / N K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03238	N	N	N	N	N	N	06/25/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										010	04
CITY							MO	SHERWOOD	MN 0		SW ELWERT RD	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	NE-SW								000	010	00
N							2P	PORTLAND UA	16.67		SW PACIFIC HY 99W	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	18	F	OR-Y		020	000		04
N							45 21 11.85	-122 52 4.18			009100100S00															OR<25					
																		02	NONE 0	STRGHT											
																			PRVTE	NW-SE								000		00
																			PSNGR CAR		01	DRVR	NONE	69	M	OR-Y		000	000		00
																										OR<25					
03471	Y	Y	N	N	N	N	06/22/2015	WASHINGTON	1	14		STRGHT		N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT										079,010	01
CITY							MO		MN 0		Not Related to Intersection	UN	(DIVMD)	UNKNOWN	N	DRY	FIX		PRVTE	NE-SW								000	079,010	00
Y							2A	PORTLAND UA	16.68			01			N	DARK	INJ		MTRCYCLE		01	DRVR	INJA	44	M	OR-Y		047,080,081	000		01
N							45 21 11.41	-122 52 4.6			009100100S00		(04)													OR<25					
03619	N	N	N	N			07/05/2018	WASHINGTON	1	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											29
NONE							TH		MN 0			UN	(NONE)	UNKNOWN	N	DRY	REAR		N/A	NE-SW								000		00
N							6P	PORTLAND UA	16.73			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 9.15	-122 52 6.49			009100100S00		(02)													UNK					
																		02	NONE 9	STRGHT											
																			N/A	NE-SW								006		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
05208	N	N	N	N			10/03/2018	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE							WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	SW-NE								000		00
N							6A	PORTLAND UA	16.55		SW SUNSET BLVD	00			N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		026	000		29
N							45 21 15.95	-122 51 58.08			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	SW-NE								011		00
																			PSNGR CAR		01	DRVR	INJB	36	F	OR-Y		000	000		00
																										OR<25					
01494	N	N	N	N			03/17/2017	WASHINGTON	2	14		STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE							FR	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	SW-NE								000		00
N							6A	PORTLAND UA	16.57		SW SUNSET BLVD	04			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		026	000		29
N							45 21 15.23	-122 51 59.17			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	SW-NE								011		00
																			PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP											
																			PRVTE	SW-NE								011		00
																			PSNGR CAR		02	PSNG	INJC	24	F			000	000		00
																		02	NONE 0	STOP											
																			PRVTE	SW-NE								011		00
																			PSNGR CAR		03	PSNG	NO<5	03	M			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J U G	S N V	W H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE	MOVE / OWNER / TO / FROM	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES / PED LOC	ERROR	ACT	EVENT	CAUSE
04491	N	N	N	N			04/13/2016	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT									29
NONE							WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW								000	00
N							5P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
N							45 21 11.45	-122 52 3.31			009100200S00															UNK				
																		02	NONE 9	STOP										
																			N/A	NE-SW								011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
																										UNK				
04670	N	N	N	N	N	N	07/31/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT									07
CITY							MO	SHERWOOD	MN 0		SW ELWERT RD	NE		UNKNOWN	N	DRY	REAR		PRVTE	NE-SW								000	00
N							4P	PORTLAND UA	16.66		SW PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	16	M	OR-Y	043	000		07
N							45 21 11.45	-122 52 3.31			009100200S00															OR<25				
																		01	NONE 0	STRGHT										
																			PRVTE	NE-SW								000		00
																			PSNGR CAR		02	PSNG	INJC	18	F		000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	NE-SW								006		00
																			PSNGR CAR		01	DRVR	INJC	18	F	OR-Y	000	000		00
																										OR<25				
04289	N	N	N	N			04/27/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT									29
NONE							TH	SHERWOOD	MN 0		SW PACIFIC HY 99W	E		TRF SIGNAL	N	DRY	REAR		N/A	SE-NW								000	00
N							7A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
N							45 21 11.45	-122 52 3.31			009100200S00															UNK				
																		02	NONE 9	STOP										
																			N/A	SE-NW								013		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
																										UNK				
04990	N	N	N	N	N	N	07/21/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									07
CITY							TU	SHERWOOD	MN 0		SW ELWERT RD	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000	00
N							4P	PORTLAND UA	16.66		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	29	F	SUSP	043	000		07
N							45 21 11.45	-122 52 3.31			009100200S00															OR<25				
																		02	NONE 0	STOP										
																			PRVTE	SW-NE								011		00
																			PSNGR CAR		01	DRVR	NONE	61	M	OR-Y	000	000		00
																										OR<25				
05463	N	N	N	N			09/04/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									29
NONE							FR	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000	00
N							11A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y	026	000		29
N							45 21 11.45	-122 52 3.31			009100200S00															OR<25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	C O R K	W	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																											OR<25					
01834	Y	Y	N	N	N	N		03/19/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT									013	07,30
CITY								SA	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								6P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	NONE		043,050	000		07,30
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								012	013	00
																				PSNGR CAR		01	DRVR	INJC	46	M	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								012	013	00
																				PSNGR CAR		02	PSNG	INJC	28	F			000	000		00
																			03	NONE 0	STOP										
																				PRVTE	SW-NE								022		00
																				PSNGR CAR		01	DRVR	NONE	34	M	OR-Y		000	000		00
																											OR<25					
02965	N	N	N	N				05/06/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE								FR	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								8A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		026	000		29
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJC	40	M	OR-Y		000	000		00
																											OR<25					
06420	N	N	N	N	N	N		09/22/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	S-STRGHT	01	NONE 0	STRGHT									087	07
CITY								TH	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	SNO	REAR		PRVTE	SW-NE								000	087	00
N								5P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y		043	000		07
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STRGHT										
																				PRVTE	SW-NE								006	087	00
																				PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		000	000		00
																											OR<25					
08928	N	N	N	N				12/25/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE								SU	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								12P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y		026	000		29
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJC	59	F	OR-Y		000	000		00
																											OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D C	A L S	M D R G N V	J U I H L	S C O R K	W	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		02	PSNG	INJC	40	M			000	000		00
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		03	PSNG	INJC	54	M			000	000		00
07321	N	N	N	N	N	N	11/18/2017	WASHINGTON	2	14		INTER	CROSS	N	N	FOG	S-STRGHT	01	NONE 9	STRGHT											07
CITY			SA					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		N/A	SW-NE									000		00
N			8P					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 21 11.45					-122 52 3.31			009100200S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	SW-NE									006		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
01690	N	N	N	N	N	N	04/04/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07
CITY			TH					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			7A					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		043	000		07
N			45 21 11.45					-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		000	000		00
																										OR<25					
03081	N	N	N	N	N	N	06/16/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
CITY			SU					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE									000		00
N			3P					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		026	000		29
N			45 21 11.45					-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	NONE	43	F	OR-Y		000	000		00
																										OR>25					
01913	N	N	N	N			04/16/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT			TU					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		UNKN	SW-NE									000		00
N			4P					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000		29
N			45 21 11.45					-122 52 3.31			009100200S00															UNK					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	INJC	28	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		02	PSNG	INJC	29	M			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A L C	D R / U G / S	M J / N I / V	S C / H	W O / R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02665	N	N	N	N	N	N	05/25/2019	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										27,29
CITY			SA					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			4P					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	21	M	OR-Y		016,026	038		27,29
N			45 21 11.45					-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0	STOP										
																			RENTL	SW-NE									011		00
																			PSNGR CAR		01	DRVR	INJC	30	F	OTH-Y		000	000		00
																										N-RES					
																		02	NONE 0	STOP										
																			RENTL	SW-NE									011		00
																			PSNGR CAR		02	PSNG	INJC	36	M			000	000		00
																		02	NONE 0	STOP										
																			RENTL	SW-NE									011		00
																			PSNGR CAR		03	PSNG	INJC	21	M			000	000		00
06006	N	N	N	N		Y	11/15/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										10
CITY			FR					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			6A					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		000	000		00
N			45 21 11.45					-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		009	000		10
																										OR<25					
06647	N	N	N	N		Y	12/14/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										27,07
CITY			SA					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			1P					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	F	SUSP		016,043	038		27,07
N			45 21 11.45					-122 52 3.31			009100200S00															UNK					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		02	PSNG	INJC	63	M			000	000		00
04827	N	N	N	N	N	N	08/24/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY			MO					SHERWOOD	MN 0		SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW-NE									000		00
N			1P					PORTLAND UA	16.66		SW SUNSET BLVD	02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	93	F	OR-Y		020	000		04
N			45 21 11.45					-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	SE-SW									000		00
																			PSNGR CAR		01	DRVR	INJB	35	F	OR-Y		000	000		00
																										OR<25					

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 16.55 to 16.75 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

45 - 49 of 63 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	C O R L	W K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																		02	NONE 0 PRVTE PSNGR CAR	TURN-L SE-SW	02	PSNG	INJC	05	M			000	000 000		00 00
05220	N	N	N	N	N	N	10/03/2018	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04,27
CITY		WE						SHERWOOD	MN 0		SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SE-NW								000		00
N		11A						PORTLAND UA	16.66		SW SUNSET BLVD	02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		000	000		00
N		45 21 11.45						-122 52 3.31			009100200S00															OR<25					
																		01	NONE 0 PRVTE PSNGR CAR	STRGHT SE-NW	02	PSNG	INJC	24	F			000	000 000		00 00
																		02	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	INJC	55	M	OTH-Y N-RES		020,016	000 038		00 04,27
06861	N	N	N	N	N	N	10/30/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										04
CITY		WE						SHERWOOD	MN 0		SW ELWERT RD	CN		TRF SIGNAL	N	DRY	TURN		N/A	SE-SW								000		00
N		6A						PORTLAND UA	16.66		SW PACIFIC HY 99W	03	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 21 11.45						-122 52 3.31			009100200S00															UNK					
																		02	NONE 9 N/A PSNGR CAR	STRGHT NW-SE	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00
05152	N	N	N	N	N	N	08/23/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY		WE						SHERWOOD	MN 0		SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SW-NE								000		00
N		12P						PORTLAND UA	16.66		SW SUNSET BLVD	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	59	M	EXP		020	000		04
N		45 21 11.45						-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0 PRVTE PSNGR CAR	STRGHT NW-SE	01	DRVR	INJC	36	F	OR-Y OR<25		000	000 000		00 00
																		03	NONE 0 PRVTE PSNGR CAR	TURN-R SE-NE	01	DRVR	INJC	19	F	OR-Y OR<25		000	022 000		00 00
02603	N	N	N	N	N	N	05/13/2015	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
CITY		WE							MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N		7A						PORTLAND UA	16.68			03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	48	F	OR-Y		043	000		07
N		45 21 10.55						-122 52 4.06			009100200S00		(04)													OR<25					
																		02	NONE 0 PRVTE PSNGR CAR	STOP S -N	01	DRVR	INJC	45	F	OR-Y OR<25		000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	W C O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / LEGS (#LANES) / (MEDIAN)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06998	N	Y	N	N	N	12/20/2018	WASHINGTON	2 14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
CITY						TH		MN 0		UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N									000		00
N						5P	PORTLAND UA	16.68		04			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		043	000		07
N						45 21 10.56	-122 52 4.05		009100200S00		(04)													OR<25					
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	INJC	30	M	OTH-Y		000	000		00
																								N-RES					
04365	N	N	N	N	N	08/02/2015	WASHINGTON	2 14		STRGHT		N	N	CLD	S-1STOP	01	NONE 0	STRGHT											33
CITY						SU		MN 0		UN	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	S -N									000		00
N						9P	PORTLAND UA	16.69		03			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	38	F	SUSP		051,026	000		33
N						45 21 10.11	-122 52 4.43		009100200S00		(04)													OR<25					
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	INJB	60	F	OTH-Y		000	000		00
																								N-RES					
06659	N	N	N	N	N	11/06/2015	WASHINGTON	2 14		STRGHT		Y	N	FOG	S-1STOP	01	NONE 0	STRGHT											07
CITY						FR		MN 0		UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N									000		00
N						7A	PORTLAND UA	16.69		03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		043,026	000		07
N						45 21 10.11	-122 52 4.43		009100200S00		(02)													OR<25					
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	NONE	31	F	OR-Y		000	000		00
																								OR<25					
08008	N	N	N	N	N	12/14/2017	WASHINGTON	2 14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										087	29
CITY						TH		MN 0		UN	(DIVMD)	TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									000	087	00
N						1P	PORTLAND UA	16.69		03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	68	M	OR-Y		042	000		29
N						45 21 10.11	-122 52 4.43		009100200S00		(04)													OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	S -N									006	087	00
																	PSNGR CAR		01	DRVR	NONE	68	F	OR-Y		000	000		00
																								OR<25					
04297	N	Y	N	N	N	08/24/2019	WASHINGTON	2 14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											07
CITY						SA		MN 0		UN	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	S -N									000		00
N						3P	PORTLAND UA	16.69		03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	M	OTH-Y		043	000		07
N						45 21 10.11	-122 52 4.44		009100200S00		(04)													OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	S -N									006		00
																	PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		000	000		00
																								OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	S -N									006		00
																	PSNGR CAR		02	PSNG	INJA	26	M			000	000		00
06116	N	N	N	N	N	10/02/2017	WASHINGTON	2 14		STRGHT		N	N	CLD	S-STRGHT	01	NONE 9	STRGHT											27,07
CITY						MO		MN 0		UN	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	S -N									000		00
N						5A	PORTLAND UA	16.69		04			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 21 10.11	-122 52 4.43		009100200S00		(04)													UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	006 000		00 00
05060 CITY N N	N	N	N	N			09/03/2015 TH 5P 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 009100200S00		STRGHT UN 03	(DIVMD) (04)	N UNKNOWN	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	26	F	OR-Y OR<25		043	000	013	07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	27	F	OR-Y OR<25		000	011 000	013	00 00
																	03	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	NONE	30	F	OR-Y OR<25		000	022 000		00 00
07488 CITY N N	N	N	N	N	N	N	12/08/2015 TU 12P 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 009100200S00		STRGHT UN 03	(DIVMD) (05)	N L-GRN-SIG	N N	RAIN WET DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	INJC	25	F	OR-Y OR<25		043	000		07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	NONE	57	F	OR-Y OR<25	000	000	011 000		00 00
07584 NONE N N	N	N	N	N			12/11/2015 FR 7A 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 009100200S00		STRGHT UN 03	(DIVMD) (04)	N UNKNOWN	N N	UNK UNK DAWN	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	32	F	OR-Y UNK	026		000 000		29 00 29
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	40	F	OR-Y OR<25	000	000	011 000		00 00
04867 COUNTY N N	N	N	N	N	N	N	09/21/2019 SA 10A 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.77	2 14 MN 0 16.70 009100200S00		STRGHT UN 04	(DIVMD) (04)	N NONE	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	31	M	OTH-Y OR<25		043	000		07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	01	DRVR	INJC	23	F	OR-Y OR<25	000	000	011 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	02	PSNG	INJC	22	F		000	000	011 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	03	PSNG	INJC	17	M		000	000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U N V	S I H L	C N R K	W O	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP / PNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / TO / FROM	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06414	N	N	N	N	N	N	N	09/22/2016	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT										29
CITY				TH						MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	S -N								000		00
N				1P					PORTLAND UA	16.71			04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 21 9.19				-122 52 5.13				009100200S00		(04)													UNK					
																			02	NONE 9	STRGHT										
																				N/A	S -N								000		00
																				TRUCK		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
01275	N	N	N	N	N	N	N	03/05/2017	WASHINGTON	2	14		STRGHT		N	N	CLD	S-1STOP	01	NONE 0	STRGHT										07,32
CITY				SU						MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	S -N								000		00
N				11A					PORTLAND UA	16.71			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	81	M	OR-Y		043,052	000		07,32
N				45 21 9.19				-122 52 5.13				009100200S00		(04)													OR<25					
																			02	NONE 0	STOP										
																				PRVTE	S -N								011	013	00
																				PSNGR CAR		01	DRVR	INJC	69	M	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP										
																				PRVTE	S -N								011	013	00
																				PSNGR CAR		02	PSNG	INJC	63	F			000	000		00
																			03	NONE 0	STOP										
																				PRVTE	S -N								022		00
																				PSNGR CAR		01	DRVR	INJC	71	M	OR-Y		000	000		00
																											OR<25					
05618	N	N	N	N	N	N	N	09/20/2017	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
CITY				WE						MN 0			UN	(DIVMD)	TRF SIGNAL	N	WET	REAR		PRVTE	S -N								000		00
N				3P					PORTLAND UA	16.71			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		043	000		07
N				45 21 9.19				-122 52 5.13				009100200S00		(04)													OR<25					
																			02	NONE 0	STOP										
																				PRVTE	S -N								011	013	00
																				PSNGR CAR		01	DRVR	INJB	52	M	OR-Y		000	000		00
																											OR<25					
																			03	NONE 0	STOP										
																				PRVTE	S -N								022		00
																				PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000		00
																											OR<25					
01240	N	N	N	N	N	N	N	03/12/2019	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
COUNTY				TU						MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N				7A					PORTLAND UA	16.71			04			N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		043	000		07
N				45 21 9.18				-122 52 5.13				009100200S00		(04)													OR<25					
																			02	NONE 0	STOP										
																				PRVTE	S -N								011		00
																				PSNGR CAR		01	DRVR	INJC	43	M	OR-Y		000	000		00
																											OR<25					

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 17.41 to 17.51 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

1 - 7 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U N V	S I H L	C N	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03760	N	N	N	N				07/24/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	ANIMAL	01	NONE 9	STRGHT									035	12
NONE								WE		MN 0		Not Related to Intersection	UN	(DIVMD)	UNKNOWN	N	DRY	OTH		N/A	N -S								000		00
N								9P	PORTLAND UA	17.42			03			N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 35.36	-122 52 24.81			009100100S00		(04)													UNK					
06064	N	N	N	N				09/29/2017	WASHINGTON	1 14			INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										29
NONE								FR		MN 0			N		STOP SIGN	N	WET	REAR		N/A	N -S								000		00
N								2P	PORTLAND UA	17.47			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															UNK					
																			02	NONE 9	STRGHT										
																				N/A	N -S								000		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
04243	N	N	N	N				08/16/2018	WASHINGTON	1 14			INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										29
NONE								TH		MN 0			E		STOP SIGN	N	DRY	REAR		PRVTE	E -W								000		00
N								4P	PORTLAND UA	17.47			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		026	000		29
N								45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	E -W								012		00
																				PSNGR CAR		01	DRVR	INJC	53	F	OR-Y		000	000		00
																											OR<25					
01401	N	N	N	N	N	N		03/20/2018	WASHINGTON	1 14			INTER	CROSS	N	Y	CLD	FIX OBJ	01	NONE 9	STRGHT									058	26
COUNTY								TU		MN 0			S		STOP SIGN	N	DRY	FIX		N/A	N -S								000		00
N								2P	PORTLAND UA	17.47			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															UNK					
00236	N	N	N	N				01/15/2015	WASHINGTON	1 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY								TH		MN 0			CN		STOP SIGN	N	WET	TURN		PRVTE	N -S								000		00
N								5P	PORTLAND UA	17.47			01	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																			02	NONE 0	TURN-L										
																				PRVTE	E -S								015		00
																				PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		028	000		02
																											OR<25					
08443	N	N	N	N	N	N		12/09/2016	WASHINGTON	1 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										03
COUNTY								FR		MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	N -S								000		00
N								3P	PORTLAND UA	17.47			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															UNK					
																			02	NONE 9	STRGHT										
																				N/A	E -W								000		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
07975	N	N	N	N				12/13/2017	WASHINGTON	1 14			INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										03
COUNTY								WE		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	E -W								000		00
N								7P	PORTLAND UA	17.47			01	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	48	M	OR-Y		021	000		03
N								45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																			02	NONE 0	STRGHT										
																				PRVTE	N -S								000		00
																				PSNGR CAR		01	DRVR	INJC	56	F	OR-Y		000	000		00
																											OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	C O R K	W DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01598	N	N	N	N		03/21/2017	WASHINGTON	1 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											02
NO RPT						TU		MN 0		CN		STOP SIGN	N	WET	ANGL		N/A	E -W									000		00
N						7A	PORTLAND UA	17.47		01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.89	-122 52 26.13		009100100S00															UNK					
																02	NONE 9	STRGHT											
																	N/A	N -S									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
02701	N	N	N	N		05/18/2015	WASHINGTON	1 14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											02
NO RPT						MO		MN 0		CN		STOP SIGN	N	DRY	TURN		PRVTE	W -E									000		00
N						5P	PORTLAND UA	17.47		03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	40	F	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13		009100100S00															OR<25					
																02	NONE 0	TURN-L											
																	PRVTE	E -S									000		00
																	PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		004,028	000		02
																								OR<25					
01335	N	N	N	N	N N	03/08/2017	WASHINGTON	1 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										058	02
COUNTY						WE		MN 0		CN		STOP SIGN	N	WET	ANGL		PRVTE	W -E									000	053	00
N						5P	PORTLAND UA	17.47		03	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13		009100100S00															OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	N -S									000		00
																	PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		028	000		02
																								OR<25					
05249	N	N	N	N		08/27/2017	WASHINGTON	1 14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L											02
NONE						SU		MN 0		CN		STOP SIGN	N	DRY	TURN		N/A	E -S									000		00
N						12P	PORTLAND UA	17.47		03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.89	-122 52 26.13		009100100S00															UNK					
																02	NONE 9	STRGHT											
																	N/A	W -E									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
03053	N	N	N	N	N N	06/15/2019	WASHINGTON	1 14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						SA		MN 0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S									000		00
N						2P	PORTLAND UA	17.47		03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	24	M	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13		009100100S00															OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	W -E									015		00
																	PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		028	000		02
																								OR<25					
05515	N	N	N	N	N N	10/24/2019	WASHINGTON	1 14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L											02
COUNTY						TH		MN 0		CN		STOP SIGN	N	DRY	TURN		PRVTE	E -S									000		00
N						11A	PORTLAND UA	17.47		03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13		009100100S00															OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	W -E									000		00
																	PSNGR CAR		01	DRVR	INJC	47	F	OR-Y		028	000		02
																								OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U G	M J / I S	S / N H	W / C L	O / R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06735	N	N	N	N	N	N	N	12/19/2019	WASHINGTON	1 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										02
COUNTY								TH		MN 0		CN		STOP SIGN	N	WET	ANGL		N/A	W -E								000		00
N								4P	PORTLAND UA	17.47		03	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13		009100100S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	N -S								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
03675	N	N	N	N	N	N	N	07/20/2019	WASHINGTON	1 14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT									010	13
COUNTY								SA		MN 0		UN	(DIVMD)	UNKNOWN	N	DRY	SS-O		PRVTE	N -S								000	010	00
N								9P	PORTLAND UA	17.50		04			N	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	21	M	UNK		045	000		13
N								45 20 31.43	-122 52 26.93		009100100S00		(04)													OR>25					
																		01	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		02	PSNG	INJB	00	M			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		01	DRVR	INJB	42	M	OR-Y		000	000		00
																										OR>25				
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		02	PSNG	INJB	13	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		03	PSNG	INJB	15	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		04	PSNG	INJB	12	F			000	000		00
00536	Y	N	N	N	N	N	N	01/28/2017	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE 9	TURN-R										01,08
COUNTY								SA		MN 0		E		STOP SIGN	N	DRY	TURN		N/A	S -E								000		00
N								4P	PORTLAND UA	17.46		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.9	-122 52 24.87		009100200S00															UNK					
																		02	NONE 9	STOP										
																			N/A	E -W								011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
05762	N	N	N	N	N	N	N	09/18/2017	WASHINGTON	2 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										27,02
COUNTY								MO		MN 0		S		STOP SIGN	N	WET	TURN		N/A	N -S								000		00
N								10A	PORTLAND UA	17.46		03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.9	-122 52 24.87		009100200S00															UNK					
																		02	NONE 9	TURN-R										
																			N/A	W -S								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U V	S N H L	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05017	N	N	N	N	N	N	09/29/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	TURN-L										08
COUNTY				SU					MN 0			W		STOP SIGN	N	DRY	TURN		PRVTE	E -S								000		00
N				2P			PORTLAND UA		17.46			05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		002	000		08
N				45 20 32.9			-122 52 24.87				009100200S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	W -E								011		00
																			PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000		00
																										OR<25				
02243	N	N	N	N	N	N	04/27/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY				MO					MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N				2P			PORTLAND UA		17.46			01	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJA	68	M	OTH-Y		000	000		00
N				45 20 32.9			-122 52 24.87				009100200S00															N-RES					
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								015		00
																			PSNGR CAR		01	DRVR	NONE	74	F	OR-Y		028	000		02
																										OR<25				
03254	N	N	N	N			05/18/2016	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										02
NO RPT				WE					MN 0			CN		STOP SIGN	N	DRY	TURN		N/A	W -N								000		00
N				6A			PORTLAND UA		17.46			02	0		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 20 32.91			-122 52 24.87				009100200S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	E -W								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
05465	N	N	N	N			10/15/2018	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY				MO					MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N				6A			PORTLAND UA		17.46			02	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	INJC	39	M	OTH-Y		000	000		00
N				45 20 32.91			-122 52 24.87				009100200S00															N-RES					
																		01	NONE 0	STRGHT										
																			PRVTE	S -N								000		00
																			PSNGR CAR		02	PSNG	INJC	52	F			000	000		00
																		01	NONE 0	STRGHT										
																			PRVTE	S -N								000		00
																			PSNGR CAR		03	PSNG	INJC	32	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								000		00
																			PSNGR CAR		01	DRVR	INJB	60	M	OR-Y		028	000		02
																										OR<25				
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								000		00
																			PSNGR CAR		02	PSNG	INJB	55	M			000	000		00
07013	N	N	N	N	N	N	12/20/2018	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										02
COUNTY				TH					MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	E -W								000		00
N				6P			PORTLAND UA		17.46			02	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 20 32.9			-122 52 24.87				009100200S00															UNK					

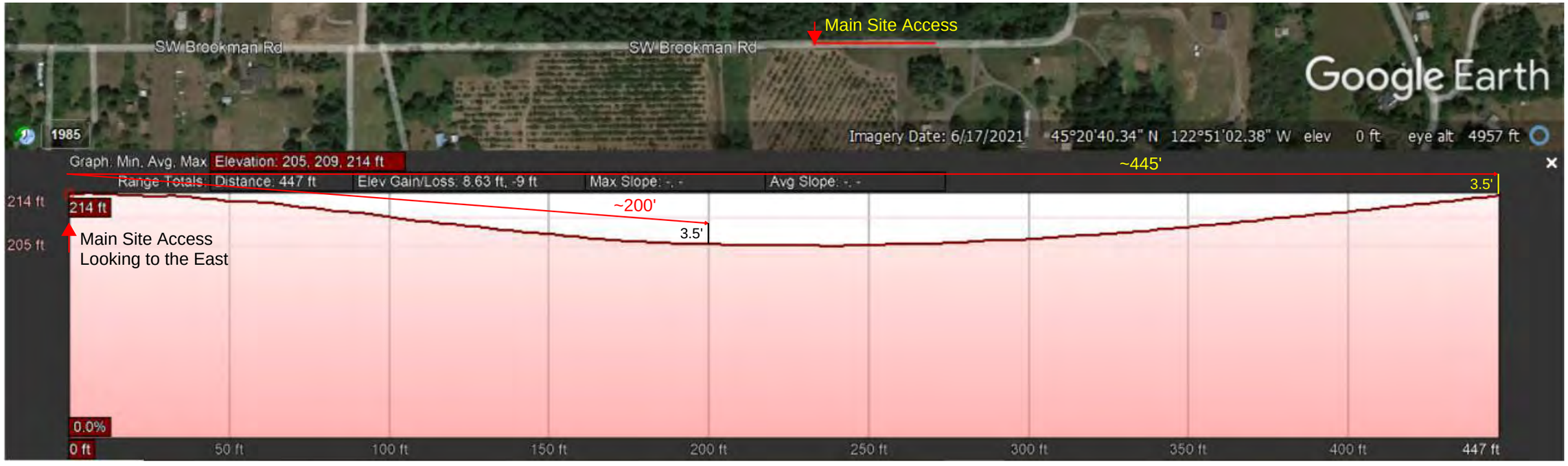
SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S N I H V	W C O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 9	STRGHT										
																		N/A	S -N									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
05536	N	N	N	N	N	10/17/2018	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT											02
COUNTY						WE		MN 0			CN		STOP SIGN	N	DRY	ANGL		N/A	S -N									000		00
N						4P	PORTLAND UA	17.46			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.9	-122 52 24.87			009100200S00															UNK					
																	02	NONE 9	STRGHT										
																		N/A	E -W									015		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
00282	N	N	N	N	N	01/16/2019	WASHINGTON	2 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						WE		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	S -N									000		00
N						7P	PORTLAND UA	17.46			02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	INJB	53	F	OR-Y		000	000		00
N						45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									015		00
																		PSNGR CAR		01	DRVR	INJC	30	M	OR-Y		028	000		02
																									OR<25					
01141	N	N	N	N	N	03/05/2019	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						TU		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N									000		00
N						5P	PORTLAND UA	17.46			02	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	65	M	OR-Y		000	000		00
N						45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									015		00
																		PSNGR CAR		01	DRVR	INJB	63	M	OR-Y		028	000		02
																									OR<25					
00125	N	N	N	N		01/08/2019	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						TU		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	S -N									000		00
N						8A	PORTLAND UA	17.46			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000		00
N						45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									015		00
																		PSNGR CAR		01	DRVR	NONE	36	M	OR-Y		028	000		02
																									OR<25					
06521	N	N	N	N	N	12/10/2019	WASHINGTON	2 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										079	03
COUNTY						TU		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	E -W									000		00
N						5P	PORTLAND UA	17.46			02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		021	000		03
N						45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	S -N									000		00
																		PSNGR CAR		01	DRVR	INJB	23	M	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	S -N									000		00
																		PSNGR CAR		02	PSNG	INJC	22	F			000	000		00

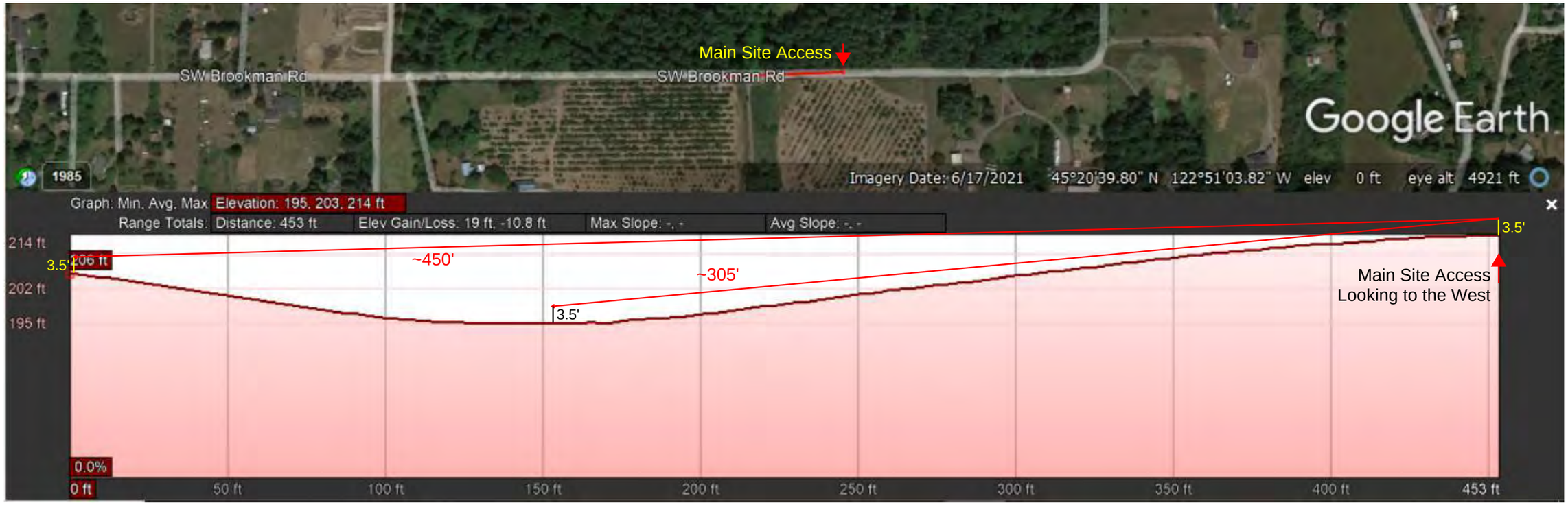
091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 17.41 to 17.51 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

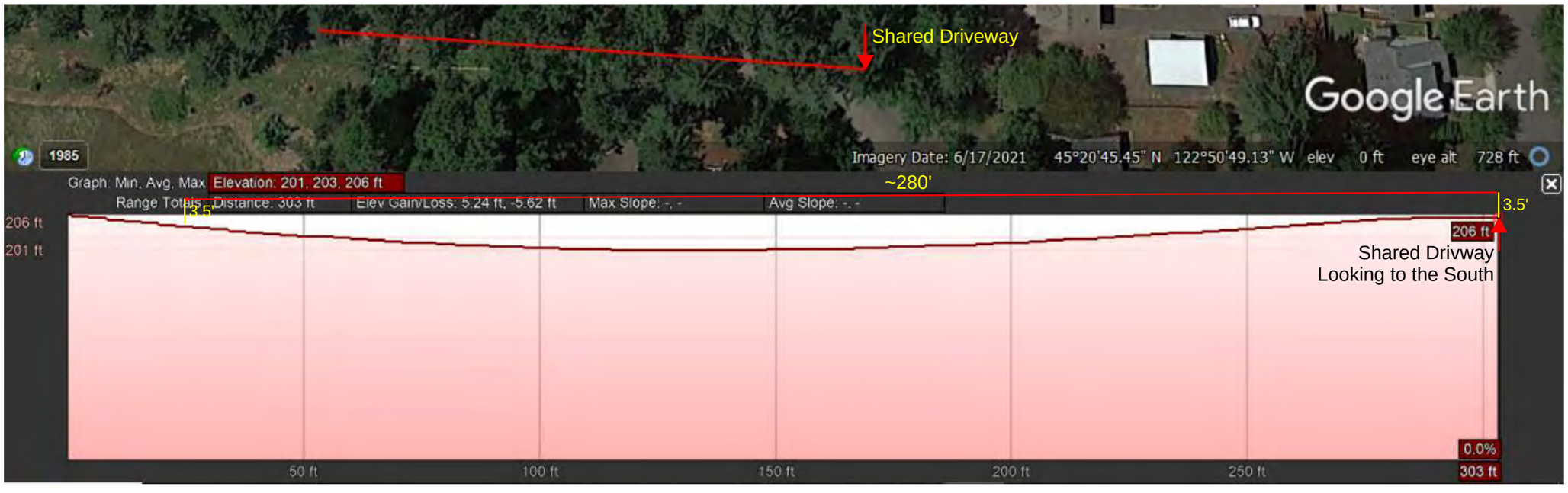
27 - 30 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U V	S I N L	C O H K	W R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																			03	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	62	M	OR-Y OR<25		000	022 000	079	00 00
06925 COUNTY N N	N	N	N	N	N	N		12/27/2019 FR 7P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 02	CROSS 0	N STOP SIGN	N N N	CLR DRY DLIT	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	INJC	32	F	OR-Y OR<25		000	 000 000	079	27,02,32 00 00
																			02	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	INJC	42	M	OR-Y OR<25		016,028,052	000 038	079	00 27,02,32
07481 COUNTY N N	N	N	N	N	N	N		11/25/2017 SA 8P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 04	CROSS 0	N STOP SIGN	N N N	CLD WET DARK	ANGL-OTH ANGL PDO	01	NONE 9 N/A PSNGR CAR	STRGHT W -E	01	DRVR	NONE	00	Unk	UNK UNK		000	 000 000		02,32 00 00
																			02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	 000 000		 00 00
02527 COUNTY N N	N	N	N	N	N	N		05/19/2018 SA 2P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 04	CROSS 0	N STOP SIGN	N N N	CLR DRY DAY	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	16	F	OR-Y OR<25		028,052	 015 000		02,32 00 02,32
																			01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	02	PSNG	INJB	16	M			000	 015 000		 00 00
																			02	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	53	M	OTH-Y N-RES		000	 000 000		 00 00


Main Site Access
SW Brookman Rd
SW Brookman Rd
Google Earth
1985
Imagery Date: 6/17/2021 45°20'40.34" N 122°51'02.38" W elev 0 ft eye alt 4957 ft
Graph: Min, Avg, Max Elevation: 205, 209, 214 ft
Range Totals: Distance: 447 ft Elev Gain/Loss: 8.63 ft, -9 ft Max Slope: -, - Avg Slope: -, -
~445'
3.5'
214 ft
214 ft
205 ft
~200'
3.5'
Main Site Access
Looking to the East
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
300 ft
350 ft
400 ft
447 ft


Main Site Access
SW Brookman Rd
SW Brookman Rd
Google Earth
1985
Imagery Date: 6/17/2021 45°20'39.80" N 122°51'03.82" W elev 0 ft eye alt 4921 ft
Graph: Min, Avg, Max Elevation: 195, 203, 214 ft
Range Totals: Distance: 453 ft Elev Gain/Loss: 19 ft, -10.8 ft Max Slope: -, - Avg Slope: -, -
3.5'
214 ft
206 ft
202 ft
195 ft
~450'
~305'
3.5'
3.5'
Main Site Access
Looking to the West
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
300 ft
350 ft
400 ft
453 ft


Shared Driveway
Google Earth
1985
Imagery Date: 6/17/2021 45°20'46.77" N 122°50'44.23" W elev 0 ft eye alt 614 ft
Graph: Min, Avg, Max Elevation: 206, 214, 220 ft
Range Totals: Distance: 303 ft Elev Gain/Loss: 14.2 ft, -0.3 ft Max Slope: -, - Avg Slope: -, -
~280'
3.5'
220 ft
206 ft
3.5'
206 ft
Shared Driveway
Looking to the East
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
303 ft


Shared Driveway
Google Earth
1985
Imagery Date: 6/17/2021 45°20'45.45" N 122°50'49.13" W elev 0 ft eye alt 728 ft
Graph: Min, Avg, Max Elevation: 201, 203, 206 ft
Range Totals: Distance: 303 ft Elev Gain/Loss: 5.24 ft, -5.62 ft Max Slope: -, - Avg Slope: -, -
~280'
3.5'
3.5'
206 ft
201 ft
206 ft
Shared Drivway
Looking to the South
0.0%
50 ft
100 ft
150 ft
200 ft
250 ft
303 ft

Left-Turn Lane Warrant Analysis

Project: Cedar Creek Gardens
Intersection: Main Access
Date: 11/4/2021
Scenario: Year 2024 Buildout Conditions - AM Peak Hour

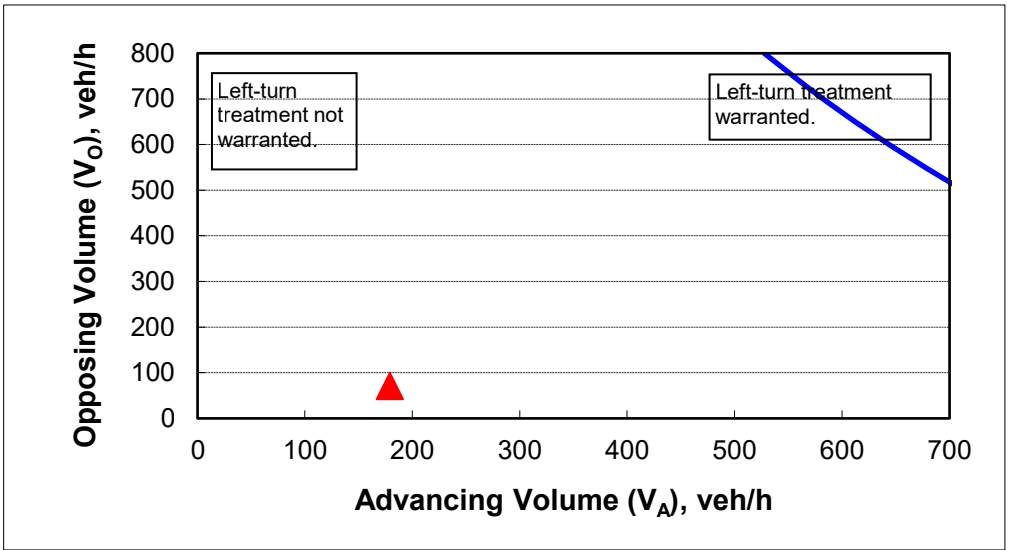
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Left-turns in advancing volume (V_A), veh/hr:	4
Advancing volume (V_A), veh/h:	179
Opposing volume (V_O), veh/h:	71

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1145
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Cedar Creek Gardens
Intersection: Main Access
Date: 11/4/2021
Scenario: Year 2024 Buildout Conditions - PM Peak Hour

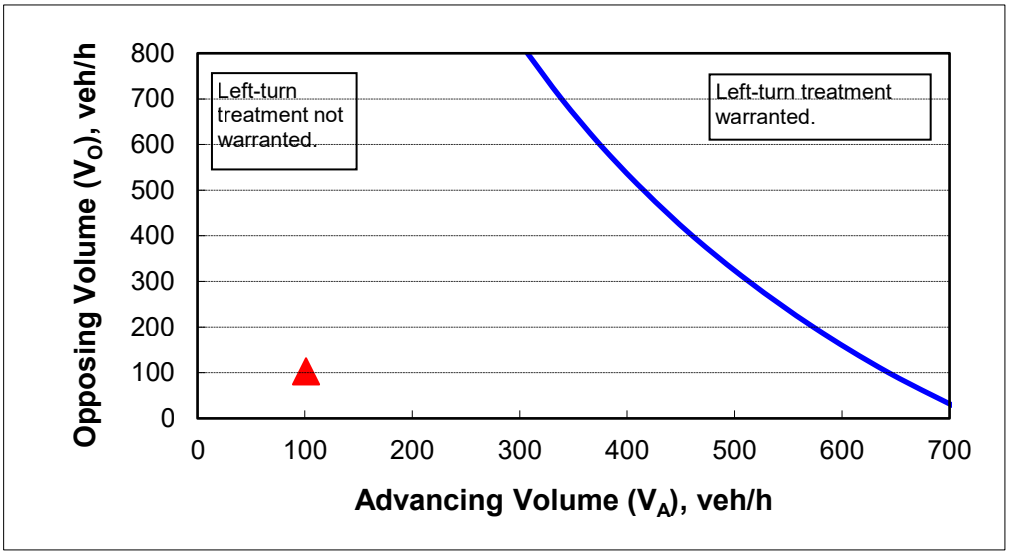
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Left-turns in advancing volume (V_A), veh/hr:	7
Advancing volume (V_A), veh/h:	101
Opposing volume (V_O), veh/h:	103

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	641
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Level of Service Definitions

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

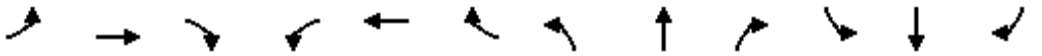
- *Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.
- *Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.
- *Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.
- *Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.
- *Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.
- *Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

Level of Service Criteria
For Signalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

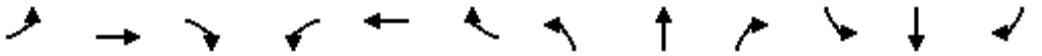
Level of Service Criteria
For Unsignalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	114	244	147	195	244	269	1644	114	141	800	16
Future Volume (vph)	22	114	244	147	195	244	269	1644	114	141	800	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3212		3367	3471	1553	3213	3312	1482
Flt Permitted	0.29	1.00	1.00	0.51	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	537	1845	1568	933	3212		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	120	257	155	205	257	283	1731	120	148	842	17
RTOR Reduction (vph)	0	0	216	0	153	0	0	0	49	0	0	8
Lane Group Flow (vph)	23	120	41	155	309	0	283	1731	71	148	842	9
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	21.5	18.2	18.2	27.1	21.0		13.5	62.4	62.4	8.2	57.1	57.1
Effective Green, g (s)	23.5	19.2	18.2	29.1	22.0		14.5	63.4	63.4	9.2	58.1	58.1
Actuated g/C Ratio	0.20	0.17	0.16	0.25	0.19		0.13	0.55	0.55	0.08	0.51	0.51
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	308	248	286	615		424	1915	856	257	1674	749
v/s Ratio Prot	0.01	0.07		c0.03	0.10		c0.08	c0.50		0.05	0.25	
v/s Ratio Perm	0.02		0.03	c0.10					0.05			0.01
v/c Ratio	0.15	0.39	0.16	0.54	0.50		0.67	0.90	0.08	0.58	0.50	0.01
Uniform Delay, d1	37.1	42.6	41.8	36.0	41.6		47.9	23.0	12.1	51.0	18.8	14.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8	0.3	2.1	0.6		4.0	6.5	0.0	3.1	0.2	0.0
Delay (s)	37.5	43.4	42.1	38.1	42.2		51.9	29.5	12.1	54.1	19.1	14.1
Level of Service	D	D	D	D	D		D	C	B	D	B	B
Approach Delay (s)		42.2			41.2			31.5			24.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	114.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	114	244	147	195	244	269	1644	114	141	800	16
Future Volume (veh/h)	22	114	244	147	195	244	269	1644	114	141	800	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	23	120	46	155	205	99	283	1731	67	148	842	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	190	198	153	245	320	149	386	2041	910	282	1868	833
Arrive On Green	0.04	0.11	0.10	0.07	0.14	0.13	0.11	0.58	0.58	0.09	0.56	0.56
Sat Flow, veh/h	1767	1856	1572	1767	2337	1086	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	23	120	46	155	153	151	283	1731	67	148	842	12
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1660	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	1.2	6.4	2.8	7.0	8.4	8.9	8.3	42.0	1.9	4.5	15.3	0.4
Cycle Q Clear(g_c), s	1.2	6.4	2.8	7.0	8.4	8.9	8.3	42.0	1.9	4.5	15.3	0.4
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	190	198	153	245	241	227	386	2041	910	282	1868	833
V/C Ratio(X)	0.12	0.61	0.30	0.63	0.63	0.67	0.73	0.85	0.07	0.53	0.45	0.01
Avail Cap(c_a), veh/h	244	306	244	245	291	274	528	2411	1075	285	2086	930
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	43.9	43.2	38.7	42.0	42.5	44.1	17.7	9.3	45.0	13.5	10.2
Incr Delay (d2), s/veh	0.3	3.0	1.1	5.3	3.2	4.6	3.4	2.6	0.0	1.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.0	1.1	3.8	3.8	3.9	3.5	15.1	0.6	1.8	5.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	46.9	44.3	44.0	45.2	47.1	47.5	20.3	9.4	46.8	13.7	10.2
LnGrp LOS	D	D	D	D	D	D	D	C	A	D	B	B
Approach Vol, veh/h		189			459			2081			1002	
Approach Delay, s/veh		45.3			45.4			23.7			18.5	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	64.1	11.0	15.0	15.7	61.3	7.9	18.1
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	70.0	6.0	16.0	15.0	63.0	6.0	16.0
Max Q Clear Time (g_c+I1), s	6.5	44.0	9.0	8.4	10.3	17.3	3.2	10.9
Green Ext Time (p_c), s	0.1	15.1	0.0	0.4	0.4	6.4	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	1.3

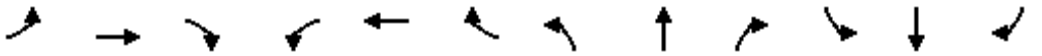
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	5	5	0	0	47	11	1925	92	22	1151	21
Future Vol, veh/h	27	5	5	0	0	47	11	1925	92	22	1151	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	275	-	-	260	-	240
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	28	5	5	0	0	49	11	2005	96	23	1199	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2270	3368	600	-	-	1051	1221	0	0	2101	0	0
Stage 1	1245	1245	-	-	-	-	-	-	-	-	-	-
Stage 2	1025	2123	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	-	-	7.08	4.18	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	-	-	3.39	2.24	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 20	7	427	0	0	212	556	-	-	241	-	-
Stage 1	174	231	-	0	0	-	-	-	-	-	-	-
Stage 2	239	82	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 14	6	427	-	-	212	556	-	-	241	-	-
Mov Cap-2 Maneuver	108	52	-	-	-	-	-	-	-	-	-	-
Stage 1	171	209	-	-	-	-	-	-	-	-	-	-
Stage 2	180	80	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	59.5	27	0.1	0.4
HCM LOS	F	D		

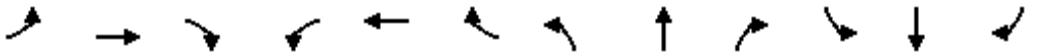
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	556	-	-	103	212	241	-	-
HCM Lane V/C Ratio	0.021	-	-	0.374	0.231	0.095	-	-
HCM Control Delay (s)	11.6	-	-	59.5	27	21.5	-	-
HCM Lane LOS	B	-	-	F	D	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.9	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	130	319	178	114	146	243	1051	135	281	1743	16
Future Volume (vph)	16	130	319	178	114	146	243	1051	135	281	1743	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3179		3400	3505	1568	3433	3539	1583
Flt Permitted	0.57	1.00	1.00	0.48	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1057	1863	1583	870	3179		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	138	339	189	121	155	259	1118	144	299	1854	17
RTOR Reduction (vph)	0	0	126	0	120	0	0	0	73	0	0	8
Lane Group Flow (vph)	17	138	213	189	156	0	259	1118	71	299	1854	9
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	24.8	22.5	22.5	32.2	26.2		9.0	59.2	59.2	13.9	64.1	64.1
Effective Green, g (s)	26.8	23.5	22.5	34.2	27.2		10.0	60.2	60.2	14.9	65.1	65.1
Actuated g/C Ratio	0.22	0.19	0.19	0.28	0.22		0.08	0.50	0.50	0.12	0.54	0.54
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	252	360	292	294	711		279	1735	776	420	1894	847
v/s Ratio Prot	0.00	0.07		c0.04	0.05		c0.08	0.32		c0.09	c0.52	
v/s Ratio Perm	0.01		0.13	c0.14					0.05			0.01
v/c Ratio	0.07	0.38	0.73	0.64	0.22		0.93	0.64	0.09	0.71	0.98	0.01
Uniform Delay, d1	37.3	42.7	46.7	38.1	38.5		55.4	22.8	16.2	51.3	27.6	13.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.7	8.8	4.8	0.2		35.0	0.8	0.1	5.6	15.8	0.0
Delay (s)	37.4	43.4	55.4	42.8	38.7		90.4	23.6	16.3	56.9	43.3	13.2
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		51.5			40.4			34.3			45.0	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	130	319	178	114	146	243	1051	135	281	1743	16
Future Volume (veh/h)	16	130	319	178	114	146	243	1051	135	281	1743	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	17	138	190	189	121	27	259	1118	85	299	1854	12
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	291	276	220	252	508	110	298	1902	848	390	2009	896
Arrive On Green	0.03	0.15	0.14	0.06	0.18	0.17	0.09	0.54	0.54	0.11	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	1753	2857	621	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	17	138	190	189	73	75	259	1118	85	299	1854	12
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1729	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	0.9	7.8	13.5	7.0	4.1	4.3	8.6	24.6	3.0	9.7	54.5	0.4
Cycle Q Clear(g_c), s	0.9	7.8	13.5	7.0	4.1	4.3	8.6	24.6	3.0	9.7	54.5	0.4
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	291	276	220	252	311	307	298	1902	848	390	2009	896
V/C Ratio(X)	0.06	0.50	0.86	0.75	0.23	0.24	0.87	0.59	0.10	0.77	0.92	0.01
Avail Cap(c_a), veh/h	345	326	262	252	311	307	298	1902	848	481	2072	924
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	45.1	48.4	43.1	40.5	40.8	51.8	17.8	12.9	49.5	22.7	10.9
Incr Delay (d2), s/veh	0.1	1.4	21.8	11.9	0.4	0.4	22.8	0.5	0.1	5.8	7.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.7	6.6	2.7	1.8	1.9	4.5	9.2	1.1	4.4	22.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3	46.5	70.3	54.9	40.9	41.2	74.6	18.3	12.9	55.3	30.1	10.9
LnGrp LOS	D	D	E	D	D	D	E	B	B	E	C	B
Approach Vol, veh/h		345			337			1462			2165	
Approach Delay, s/veh		59.2			48.8			28.0			33.4	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	66.0	11.0	20.9	14.0	69.0	7.5	24.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	15.0	60.0	6.0	19.0	9.0	66.0	6.0	19.0
Max Q Clear Time (g_c+I1), s	11.7	26.6	9.0	15.5	10.6	56.5	2.9	6.3
Green Ext Time (p_c), s	0.3	9.3	0.0	0.5	0.0	7.5	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	34.9
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.5

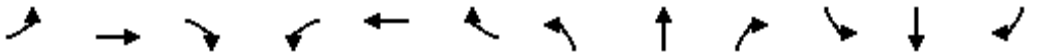
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	5	11	0	0	32	16	1379	49	27	2155	48
Future Vol, veh/h	22	5	11	0	0	32	16	1379	49	27	2155	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	275	-	-	260	-	240
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	23	5	11	0	0	33	17	1436	51	28	2245	50

Major/Minor	Minor2		Minor1			Major1				Major2		
Conflicting Flow All	3053	3822	1123	-	-	744	2295	0	0	1487	0	0
Stage 1	2301	2301	-	-	-	-	-	-	-	-	-	-
Stage 2	752	1521	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	-	-	6.92	4.16	-	-	4.14	-	-
Critical Hdwy Stg 1	6.56	5.56	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	-	-	3.31	2.23	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 5	~ 4	198	0	0	359	213	-	-	448	-	-
Stage 1	39	71	-	0	0	-	-	-	-	-	-	-
Stage 2	366	178	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 4	~ 3	198	-	-	359	213	-	-	448	-	-
Mov Cap-2 Maneuver	34	55	-	-	-	-	-	-	-	-	-	-
Stage 1	36	67	-	-	-	-	-	-	-	-	-	-
Stage 2	306	164	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	212	16.1	0.3	0.2
HCM LOS	F	C		

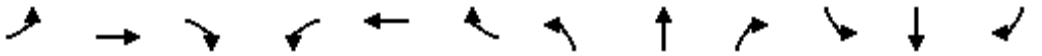
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	213	-	-	48	359	448	-	-
HCM Lane V/C Ratio	0.078	-	-	0.825	0.093	0.063	-	-
HCM Control Delay (s)	23.3	-	-	212	16.1	13.6	-	-
HCM Lane LOS	C	-	-	F	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	3.4	0.3	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	255	290	162	402	237	383	1697	121	192	764	195
Future Volume (vph)	133	255	290	162	402	237	383	1697	121	192	764	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3310		3367	3471	1553	3213	3312	1482
Flt Permitted	0.18	1.00	1.00	0.24	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	325	1845	1568	441	3310		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	268	305	171	423	249	403	1786	127	202	804	205
RTOR Reduction (vph)	0	0	168	0	70	0	0	0	50	0	0	110
Lane Group Flow (vph)	140	268	137	171	602	0	403	1786	77	202	804	95
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	27.7	21.7	21.7	29.7	22.7		18.2	64.1	64.1	8.0	53.9	53.9
Effective Green, g (s)	29.7	22.7	21.7	31.7	23.7		19.2	65.1	65.1	9.0	54.9	54.9
Actuated g/C Ratio	0.25	0.19	0.18	0.26	0.20		0.16	0.54	0.54	0.07	0.45	0.45
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	346	281	202	649		535	1870	836	239	1505	673
v/s Ratio Prot	0.05	0.15		c0.06	c0.18		c0.12	c0.51		0.06	0.24	
v/s Ratio Perm	0.16		0.09	0.17					0.05			0.06
v/c Ratio	0.86	0.77	0.49	0.85	0.93		0.75	0.96	0.09	0.85	0.53	0.14
Uniform Delay, d1	40.7	46.6	44.5	39.6	47.7		48.5	26.5	13.5	55.2	23.7	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	10.3	1.3	26.4	19.4		5.9	11.9	0.0	23.0	0.4	0.1
Delay (s)	75.6	57.0	45.9	66.0	67.1		54.5	38.3	13.6	78.2	24.1	19.3
Level of Service	E	E	D	E	E		D	D	B	E	C	B
Approach Delay (s)		55.9			66.9			39.8			32.3	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	255	290	162	402	237	383	1697	121	192	764	195
Future Volume (veh/h)	133	255	290	162	402	237	383	1697	121	192	764	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	140	268	94	171	423	91	403	1786	74	202	804	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	197	313	252	211	512	109	496	1922	857	251	1614	720
Arrive On Green	0.06	0.17	0.16	0.07	0.18	0.17	0.15	0.55	0.55	0.08	0.48	0.48
Sat Flow, veh/h	1767	1856	1572	1767	2890	617	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	140	268	94	171	257	257	403	1786	74	202	804	200
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1745	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	7.0	16.4	6.3	8.0	16.4	16.7	13.4	55.0	2.6	7.1	19.2	9.4
Cycle Q Clear(g_c), s	7.0	16.4	6.3	8.0	16.4	16.7	13.4	55.0	2.6	7.1	19.2	9.4
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	313	252	211	312	309	496	1922	857	251	1614	720
V/C Ratio(X)	0.71	0.86	0.37	0.81	0.82	0.83	0.81	0.93	0.09	0.81	0.50	0.28
Avail Cap(c_a), veh/h	197	333	269	211	331	328	610	1971	879	251	1614	720
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	47.3	43.9	41.5	46.4	46.7	48.5	24.3	12.5	53.2	20.8	18.2
Incr Delay (d2), s/veh	11.1	18.6	0.9	20.8	14.6	15.9	6.8	8.3	0.0	17.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	9.1	2.5	2.3	8.4	8.5	6.0	22.5	0.9	3.4	7.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	65.9	44.9	62.4	61.0	62.6	55.3	32.6	12.5	70.4	21.0	18.4
LnGrp LOS	D	E	D	E	E	E	E	C	B	E	C	B
Approach Vol, veh/h		502			685			2263			1206	
Approach Delay, s/veh		58.0			62.0			36.0			28.8	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	68.4	12.0	23.7	21.1	60.3	11.0	24.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	65.0	7.0	20.0	20.0	53.0	6.0	21.0
Max Q Clear Time (g_c+I1), s	9.1	57.0	10.0	18.4	15.4	21.2	9.0	18.7
Green Ext Time (p_c), s	0.0	6.3	0.0	0.3	0.6	6.6	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	40.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	37	0	0	135	0	2030	104	0	1206	30
Future Vol, veh/h	0	0	37	0	0	135	0	2030	104	0	1206	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	0	0	39	0	0	141	0	2115	108	0	1256	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	628	-	-	1112	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.08	-	-	7.08	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.39	-	-	3.39	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	409	0	0	192	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	409	-	-	192	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	62.6	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	409	192	-	-
HCM Lane V/C Ratio	-	-	0.094	0.732	-	-
HCM Control Delay (s)	-	-	14.7	62.6	-	-
HCM Lane LOS	-	-	B	F	-	-
HCM 95th %tile Q(veh)	-	-	0.3	4.7	-	-

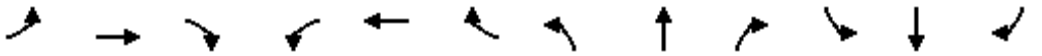
Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	121	50	18	52	77
Future Vol, veh/h	27	121	50	18	52	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	40	178	74	26	76	113

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	100	0	-	0	345	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1499	-	-	-	656	977
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1499	-	-	-	636	977
Mov Cap-2 Maneuver	-	-	-	-	636	-
Stage 1	-	-	-	-	913	-
Stage 2	-	-	-	-	790	-

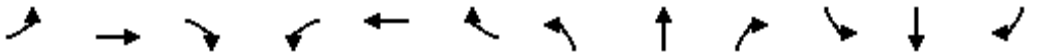
Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1499	-	-	-	803
HCM Lane V/C Ratio	0.026	-	-	-	0.236
HCM Control Delay (s)	7.5	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	177	346	192	155	154	285	1107	143	423	1755	46
Future Volume (vph)	46	177	346	192	155	154	285	1107	143	423	1755	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3212		3400	3505	1568	3433	3539	1583
Flt Permitted	0.45	1.00	1.00	0.36	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	831	1863	1583	655	3212		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	188	368	204	165	164	303	1178	152	450	1867	49
RTOR Reduction (vph)	0	0	138	0	132	0	0	0	84	0	0	23
Lane Group Flow (vph)	49	188	230	204	197	0	303	1178	68	450	1867	26
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.7	20.2	20.2	31.7	22.7		10.0	54.2	54.2	19.9	64.1	64.1
Effective Green, g (s)	28.7	21.2	20.2	33.7	23.7		11.0	55.2	55.2	20.9	65.1	65.1
Actuated g/C Ratio	0.23	0.17	0.16	0.27	0.19		0.09	0.45	0.45	0.17	0.53	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	250	320	259	266	617		303	1569	701	581	1868	835
v/s Ratio Prot	0.01	0.10		c0.06	0.06		c0.09	0.34		0.13	c0.53	
v/s Ratio Perm	0.03		0.15	c0.15					0.04			0.02
v/c Ratio	0.20	0.59	0.89	0.77	0.32		1.00	0.75	0.10	0.77	1.00	0.03
Uniform Delay, d1	37.4	47.0	50.4	39.0	42.9		56.1	28.3	19.7	48.9	29.1	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.7	28.5	12.4	0.3		51.7	2.1	0.1	6.4	20.5	0.0
Delay (s)	37.8	49.8	78.9	51.4	43.2		107.9	30.4	19.7	55.3	49.6	14.0
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		66.5			46.3			43.8			50.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	177	346	192	155	154	285	1107	143	423	1755	46
Future Volume (veh/h)	46	177	346	192	155	154	285	1107	143	423	1755	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	49	188	219	204	165	36	303	1178	93	450	1867	44
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	305	281	225	259	530	113	315	1677	748	544	1923	858
Arrive On Green	0.05	0.15	0.14	0.08	0.18	0.18	0.09	0.48	0.48	0.16	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1753	2868	611	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	49	188	219	204	99	102	303	1178	93	450	1867	44
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1731	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	2.7	11.4	16.5	10.0	5.9	6.1	10.6	31.5	4.0	15.1	60.9	1.6
Cycle Q Clear(g_c), s	2.7	11.4	16.5	10.0	5.9	6.1	10.6	31.5	4.0	15.1	60.9	1.6
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	281	225	259	323	320	315	1677	748	544	1923	858
V/C Ratio(X)	0.16	0.67	0.97	0.79	0.31	0.32	0.96	0.70	0.12	0.83	0.97	0.05
Avail Cap(c_a), veh/h	367	281	225	259	323	320	315	1677	748	663	1927	859
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	48.1	51.2	41.2	42.2	42.5	54.2	24.8	17.5	48.9	26.6	13.0
Incr Delay (d2), s/veh	0.2	6.0	52.6	14.7	0.5	0.6	40.8	1.3	0.1	7.2	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.7	9.7	2.2	2.6	2.7	6.2	12.6	1.4	6.9	26.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	54.1	103.8	55.9	42.7	43.0	95.0	26.1	17.6	56.1	40.8	13.0
LnGrp LOS	D	D	F	E	D	D	F	C	B	E	D	B
Approach Vol, veh/h		456			405			1574			2361	
Approach Delay, s/veh		76.5			49.4			38.9			43.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.9	61.0	14.0	22.0	15.0	68.9	9.8	26.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	22.0	52.0	9.0	17.0	10.0	64.0	9.0	17.0
Max Q Clear Time (g_c+I1), s	17.1	33.5	12.0	18.5	12.6	62.9	4.7	8.1
Green Ext Time (p_c), s	0.7	8.0	0.0	0.0	0.0	1.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	42	0	0	81	0	1451	72	0	2229	60
Future Vol, veh/h	0	0	42	0	0	81	0	1451	72	0	2229	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	0	0	44	0	0	84	0	1511	75	0	2322	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1161	-	-	793	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.96	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.33	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	187	0	0	334	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	187	-	-	334	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	19.4	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	187	334	-	-
HCM Lane V/C Ratio	-	-	0.234	0.253	-	-
HCM Control Delay (s)	-	-	30	19.4	-	-
HCM Lane LOS	-	-	D	C	-	-
HCM 95th %tile Q(veh)	-	-	0.9	1	-	-

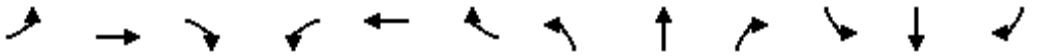
Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	85	59	43	54	34	48
Future Vol, veh/h	85	59	43	54	34	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	123	86	62	78	49	70

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	140	0	-	0	433	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1443	-	-	-	584	960
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	731	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1443	-	-	-	532	960
Mov Cap-2 Maneuver	-	-	-	-	532	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	731	-

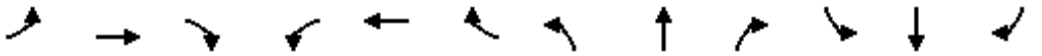
Approach	EB	WB	SB
HCM Control Delay, s	4.6	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1443	-	-	-	720
HCM Lane V/C Ratio	0.085	-	-	-	0.165
HCM Control Delay (s)	7.7	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	255	290	165	403	239	383	1707	121	196	764	195
Future Volume (vph)	133	255	290	165	403	239	383	1707	121	196	764	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3309		3367	3471	1553	3213	3312	1482
Flt Permitted	0.18	1.00	1.00	0.22	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	337	1845	1568	413	3309		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	268	305	174	424	252	403	1797	127	206	804	205
RTOR Reduction (vph)	0	0	168	0	71	0	0	0	50	0	0	109
Lane Group Flow (vph)	140	268	137	174	605	0	403	1797	77	206	804	96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.9	20.9	20.9	28.9	21.9		18.2	64.7	64.7	8.0	54.5	54.5
Effective Green, g (s)	28.9	21.9	20.9	30.9	22.9		19.2	65.7	65.7	9.0	55.5	55.5
Actuated g/C Ratio	0.24	0.18	0.17	0.26	0.19		0.16	0.54	0.54	0.07	0.46	0.46
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	335	271	194	628		536	1890	846	239	1524	682
v/s Ratio Prot	0.05	0.15		c0.06	c0.18		c0.12	c0.52		0.06	0.24	
v/s Ratio Perm	0.16		0.09	0.17					0.05			0.06
v/c Ratio	0.86	0.80	0.51	0.90	0.96		0.75	0.95	0.09	0.86	0.53	0.14
Uniform Delay, d1	41.1	47.3	45.2	40.5	48.4		48.4	25.9	13.2	55.2	23.2	18.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	12.8	1.5	37.0	26.8		5.9	11.2	0.0	25.8	0.3	0.1
Delay (s)	76.0	60.0	46.7	77.5	75.2		54.3	37.2	13.2	81.0	23.5	18.9
Level of Service	E	E	D	E	E		D	D	B	F	C	B
Approach Delay (s)		57.5			75.7			38.8			32.5	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	255	290	165	403	239	383	1707	121	196	764	195
Future Volume (veh/h)	133	255	290	165	403	239	383	1707	121	196	764	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	140	268	94	174	424	94	403	1797	74	206	804	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	193	309	249	207	504	111	495	1936	863	249	1625	725
Arrive On Green	0.06	0.17	0.16	0.07	0.18	0.17	0.15	0.55	0.55	0.08	0.48	0.48
Sat Flow, veh/h	1767	1856	1572	1767	2873	632	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	140	268	94	174	259	259	403	1797	74	206	804	200
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1742	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	7.0	16.6	6.3	8.0	16.7	17.0	13.5	55.7	2.6	7.3	19.2	9.4
Cycle Q Clear(g_c), s	7.0	16.6	6.3	8.0	16.7	17.0	13.5	55.7	2.6	7.3	19.2	9.4
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	193	309	249	207	309	305	495	1936	863	249	1625	725
V/C Ratio(X)	0.73	0.87	0.38	0.84	0.84	0.85	0.81	0.93	0.09	0.83	0.49	0.28
Avail Cap(c_a), veh/h	193	315	253	207	314	310	605	1987	886	249	1625	725
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	47.9	44.4	42.4	47.0	47.3	48.9	24.2	12.3	53.7	20.6	18.1
Incr Delay (d2), s/veh	12.7	21.3	0.9	25.2	17.6	19.2	7.0	8.2	0.0	20.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	9.4	0.1	2.7	8.8	8.9	6.1	22.6	0.9	3.6	7.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	69.2	45.4	67.6	64.6	66.5	55.9	32.4	12.4	73.8	20.9	18.3
LnGrp LOS	D	E	D	E	E	E	E	C	B	E	C	B
Approach Vol, veh/h		502			692			2274			1210	
Approach Delay, s/veh		60.5			66.1			35.9			29.4	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	69.3	12.0	23.7	21.2	61.1	11.0	24.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	66.0	7.0	19.0	20.0	54.0	6.0	20.0
Max Q Clear Time (g_c+I1), s	9.3	57.7	10.0	18.6	15.5	21.2	9.0	19.0
Green Ext Time (p_c), s	0.0	6.6	0.0	0.1	0.6	6.6	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	41.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	37	0	0	145	0	2030	105	0	1206	30
Future Vol, veh/h	0	0	37	0	0	145	0	2030	105	0	1206	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	0	0	39	0	0	151	0	2115	109	0	1256	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	628	-	-	1112	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.08	-	-	7.08	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.39	-	-	3.39	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	409	0	0	192	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	409	-	-	192	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	70.3	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	409	192	-	-
HCM Lane V/C Ratio	-	-	0.094	0.787	-	-
HCM Control Delay (s)	-	-	14.7	70.3	-	-
HCM Lane LOS	-	-	B	F	-	-
HCM 95th %tile Q(veh)	-	-	0.3	5.4	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	125	61	19	54	80
Future Vol, veh/h	28	125	61	19	54	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	41	184	90	28	79	118

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	118	0	-	0	370	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1476	-	-	-	634	956
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1476	-	-	-	614	956
Mov Cap-2 Maneuver	-	-	-	-	614	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1476	-	-	-	781
HCM Lane V/C Ratio	0.028	-	-	-	0.252
HCM Control Delay (s)	7.5	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	175	69	2	6	11
Future Vol, veh/h	4	175	69	2	6	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	6	257	101	3	9	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	104	0	-	0	372	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	269	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1494	-	-	-	633	957
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	781	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1494	-	-	-	630	957
Mov Cap-2 Maneuver	-	-	-	-	630	-
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	781	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1494	-	-	-	809
HCM Lane V/C Ratio	0.004	-	-	-	0.031
HCM Control Delay (s)	7.4	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

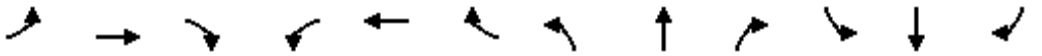
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	181	71	0
Future Vol, veh/h	2	0	0	181	71	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	1	1	8	8
Mvmt Flow	3	0	0	266	104	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	370	104	104	0	-	0
Stage 1	104	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	630	951	1494	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	630	951	1494	-	-	-
Mov Cap-2 Maneuver	630	-	-	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	779	-	-	-	-	-

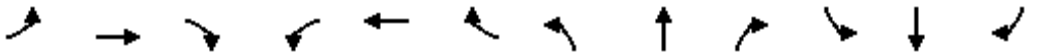
Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	630	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	10.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	178	346	193	156	155	285	1114	143	429	1755	46
Future Volume (vph)	46	178	346	193	156	155	285	1114	143	429	1755	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3212		3400	3505	1568	3433	3539	1583
Flt Permitted	0.44	1.00	1.00	0.36	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	826	1863	1583	651	3212		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	189	368	205	166	165	303	1185	152	456	1867	49
RTOR Reduction (vph)	0	0	138	0	133	0	0	0	84	0	0	23
Lane Group Flow (vph)	49	189	230	205	198	0	303	1185	68	456	1867	26
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.7	20.2	20.2	31.7	22.7		10.0	54.1	54.1	20.0	64.1	64.1
Effective Green, g (s)	28.7	21.2	20.2	33.7	23.7		11.0	55.1	55.1	21.0	65.1	65.1
Actuated g/C Ratio	0.23	0.17	0.16	0.27	0.19		0.09	0.45	0.45	0.17	0.53	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	249	320	259	265	617		303	1566	700	584	1868	835
v/s Ratio Prot	0.01	0.10		c0.06	0.06		c0.09	0.34		0.13	c0.53	
v/s Ratio Perm	0.03		0.15	c0.15					0.04			0.02
v/c Ratio	0.20	0.59	0.89	0.77	0.32		1.00	0.76	0.10	0.78	1.00	0.03
Uniform Delay, d1	37.4	47.1	50.4	39.1	42.9		56.1	28.5	19.7	48.9	29.1	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.9	28.5	13.1	0.3		51.7	2.1	0.1	6.7	20.5	0.0
Delay (s)	37.8	50.0	78.9	52.2	43.2		107.9	30.6	19.8	55.7	49.6	14.0
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		66.6			46.6			43.9			50.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	178	346	193	156	155	285	1114	143	429	1755	46
Future Volume (veh/h)	46	178	346	193	156	155	285	1114	143	429	1755	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	49	189	219	205	166	37	303	1185	93	456	1867	44
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	304	281	225	259	528	115	315	1671	745	549	1923	858
Arrive On Green	0.05	0.15	0.14	0.08	0.18	0.18	0.09	0.47	0.47	0.16	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1753	2856	622	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	49	189	219	205	100	103	303	1185	93	456	1867	44
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1729	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	2.7	11.5	16.5	10.0	5.9	6.2	10.6	31.9	4.0	15.3	60.9	1.6
Cycle Q Clear(g_c), s	2.7	11.5	16.5	10.0	5.9	6.2	10.6	31.9	4.0	15.3	60.9	1.6
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	304	281	225	259	323	320	315	1671	745	549	1923	858
V/C Ratio(X)	0.16	0.67	0.97	0.79	0.31	0.32	0.96	0.71	0.12	0.83	0.97	0.05
Avail Cap(c_a), veh/h	366	281	225	259	323	320	315	1671	745	663	1927	859
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	48.2	51.2	41.3	42.2	42.5	54.2	25.0	17.6	48.8	26.6	13.0
Incr Delay (d2), s/veh	0.2	6.2	52.6	15.3	0.5	0.6	40.8	1.4	0.1	7.4	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.8	9.7	2.3	2.6	2.7	6.2	12.8	1.4	7.0	26.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	54.3	103.8	56.6	42.8	43.1	95.0	26.4	17.7	56.3	40.8	13.0
LnGrp LOS	D	D	F	E	D	D	F	C	B	E	D	B
Approach Vol, veh/h		457			408			1581			2367	
Approach Delay, s/veh		76.5			49.8			39.0			43.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.1	60.8	14.0	22.0	15.0	68.9	9.8	26.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	22.0	52.0	9.0	17.0	10.0	64.0	9.0	17.0
Max Q Clear Time (g_c+I1), s	17.3	33.9	12.0	18.5	12.6	62.9	4.7	8.2
Green Ext Time (p_c), s	0.7	7.9	0.0	0.0	0.0	1.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	45.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	42	0	0	88	0	1451	74	0	2229	60
Future Vol, veh/h	0	0	42	0	0	88	0	1451	74	0	2229	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	0	0	44	0	0	92	0	1511	77	0	2322	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1161	-	-	794	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.96	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.33	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	187	0	0	333	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	187	-	-	333	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	19.9	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	187	333	-	-
HCM Lane V/C Ratio	-	-	0.234	0.275	-	-
HCM Control Delay (s)	-	-	30	19.9	-	-
HCM Lane LOS	-	-	D	C	-	-
HCM 95th %tile Q(veh)	-	-	0.9	1.1	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	87	66	50	55	35	50
Future Vol, veh/h	87	66	50	55	35	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	126	96	72	80	51	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	460	112
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1429	-	-	-	563	947
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1429	-	-	-	511	947
Mov Cap-2 Maneuver	-	-	-	-	511	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	SB
HCM Control Delay, s	4.4	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	701
HCM Lane V/C Ratio	0.088	-	-	-	0.176
HCM Control Delay (s)	7.8	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	94	98	5	4	7
Future Vol, veh/h	7	94	98	5	4	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	10	136	142	7	6	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	149	0	-	0	302	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1432	-	-	-	694	906
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	877	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1432	-	-	-	688	906
Mov Cap-2 Maneuver	-	-	-	-	688	-
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	877	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1432	-	-	-	812
HCM Lane V/C Ratio	0.007	-	-	-	0.02
HCM Control Delay (s)	7.5	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	98	103	1
Future Vol, veh/h	1	0	0	98	103	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	1	1	8	8
Mvmt Flow	1	0	0	144	151	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	296	152	152	0	-	0
Stage 1	152	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	695	894	1435	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	883	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	695	894	1435	-	-	-
Mov Cap-2 Maneuver	695	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1435	-	695	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

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9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

MEMORANDUM

To: Eric Rutledge
Bob Galati, P.E.
City of Sherwood

From: Brent Fitch, P.E.
Pioneer Design Group, Inc.

Project: **Cedar Creek Gardens**
PDG No. 285-021

Date: 10/22/2021

RE: Cedar Creek Gardens – SW Brookman Road Improvements

Please find attached preliminary engineering plans showing both an interim 25 MPH design and the future 35 MPH build-out of the SW Brookman Road frontage with the Cedar Creek Gardens development, and in particular the intersection of internal Street "A" and SW Brookman Road. Also included are typical street sections and profiles for both designs.

Due to the existing horizontal and vertical alignment of SW Brookman Road, the design of the future 35mph design speed would result in an approximately 3.7' cut at the intersection with Street A, resulting in significant safety and constructability concerns. Accordingly, during the construction of SW Brookman Road to the future 35 MPH standard will need to be achieved through a comprehensive capital improvement project, including adequate ROW dedication by others to allow for a safe and functioning road.

There is an existing natural resource with in the dedicated ROW. Cedar Creek crosses Brookman Road at the west property boundary before meandering through the center of the site. The drainage way flows across Brookman Road from south to north in existing culverts where it moves out of the ROW and into Cedar Creek. Future expansion will require filling a portion of Cedar Creek on the west boundary, and part of an existing wetland on the east boundary.

As shown on the 25 MPH Interim Design drawings, the applicant proposes to construct appropriate corner returns at the Street A intersection within the development, with standard tapers back to the existing roadway. The applicant also proposes appropriate ROW dedication to meet the future 35 MPH standard, as shown. It is understood that both the ROW dedication and any required fee-in-lieu payment will be eligible for 100%

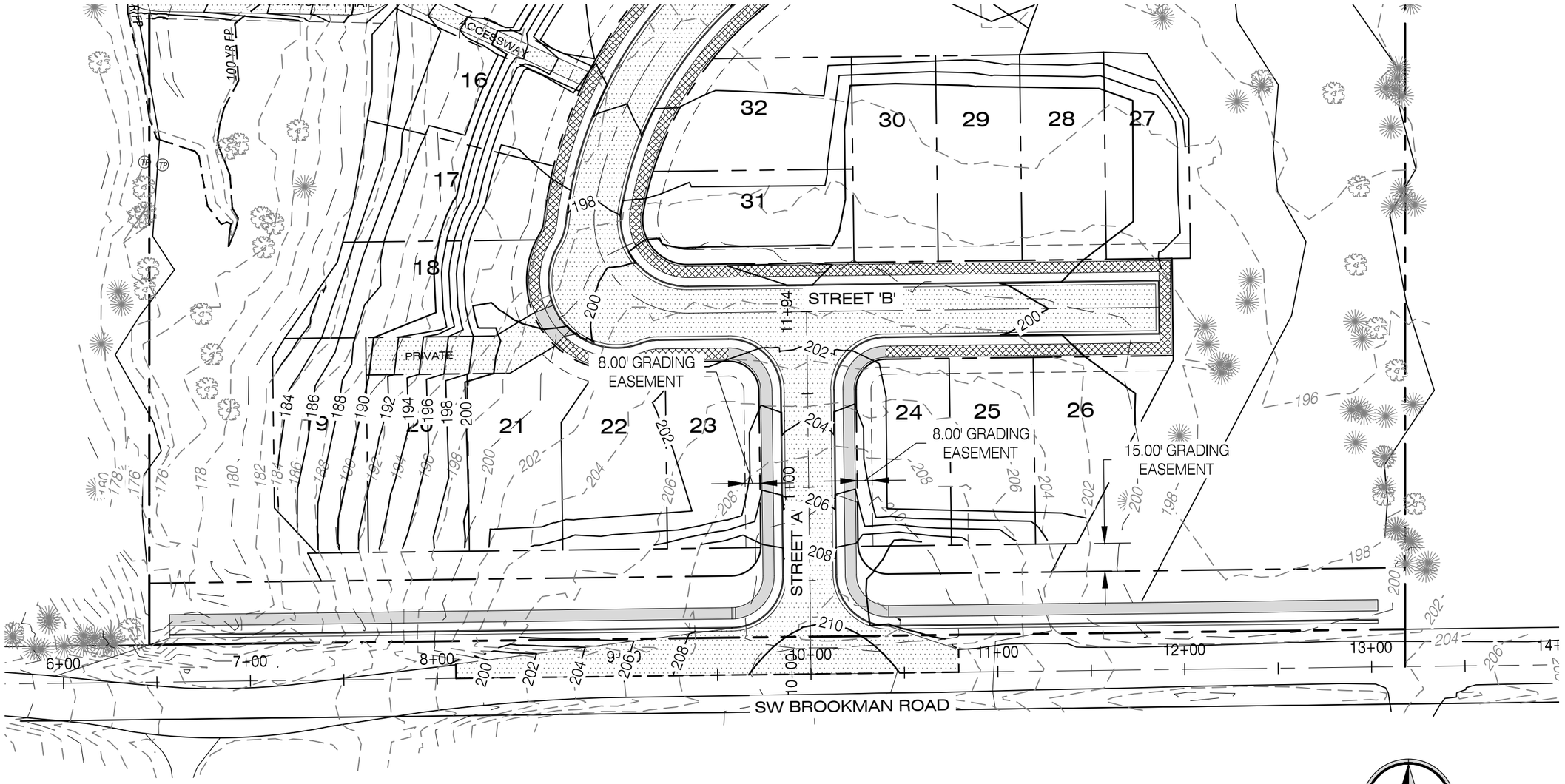
Transportation Development Tax credits. Interim stormwater conveyance will be located within the proposed roadside ditch within the dedicated ROW.

As shown on the 35 MPH Improvement drawings, the applicant has provided appropriate ROW dedication to accommodate construction of the future facility. In addition, street sections and profiles show the Street A intersection has been designed to minimize reconstruction as much as practicable, while avoiding impacts to the proposed dwellings within the Cedar Creek Gardens Development. Future stormwater management facilities can be built to current Clean Water Services (CWS) standards within the required 15' wide visual corridor located behind the proposed ROW, with the provision of appropriate easements. Further, City visual corridor requirements do not prohibit the placement of such facilities, provided compliance with street tree and landscaping requirements can be achieved. City of Sherwood street tree standards include appropriate street trees species to meet both CWS and City landscaping requirements.

It is PDG's opinion that all provisions for future and interim improvements are identified within the attached exhibits, and should any questions arise regarding the above, that you will contact PDG staff directly.

BROOKMAN ROAD EXHIBIT - MEETING EXISTING CONDITIONS (25 MPH)

CEDAR CREEK GARDENS



SW BROOKMAN ROAD DESIGN - PLAN

SCALE: 1"=60' (H)

N

SCALE

60 0 30 60

1 INCH = 60 FEET

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PH: 503.643.8286 PH: 808.753.2376
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Designed by	CFS	Date	09/2021		
Drawn by	CFS	Date	09/2021		
Reviewed by	BEF	Date	09/2021		
Project No.	285-021	REF.			
Horiz. Scale:					
Vert. Scale:					

BROOKMAN EXHIBIT.DWG

Project
CEDAR CREEK GARDENS

No.
285-021

Type
PLANNING

Sheet
1 of 5

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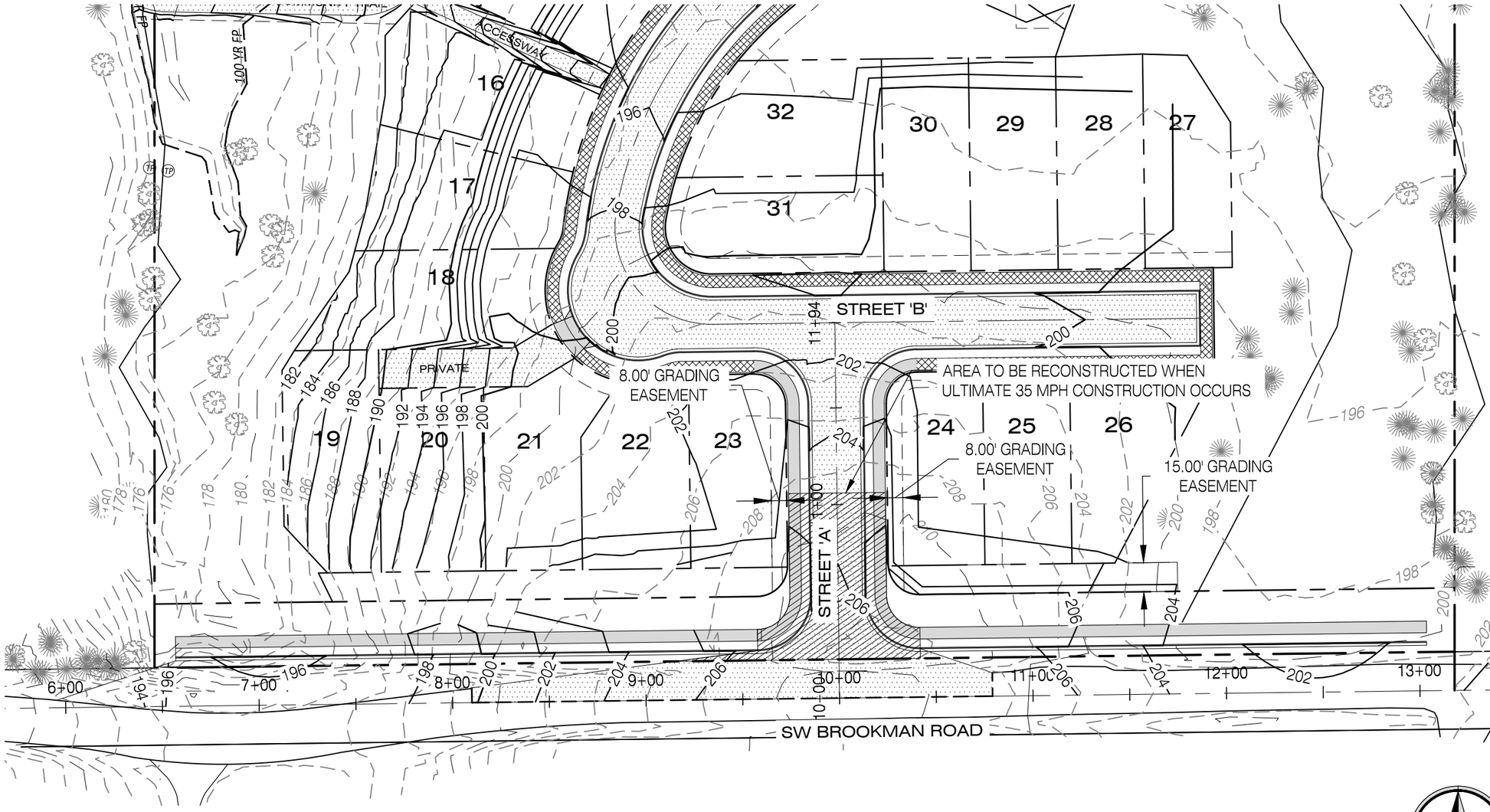
BROOKMAN ROAD EXHIBIT - MEETING FUTURE DESIGN CONDITIONS (35 MPH)

CEDAR CREEK GARDENS



SW BROOKMAN ROAD ULTIMATE DESIGN - PLAN

SCALE: 1"=60' (H)

N

SCALE

60 0 30 60

1 INCH = 60 FEET

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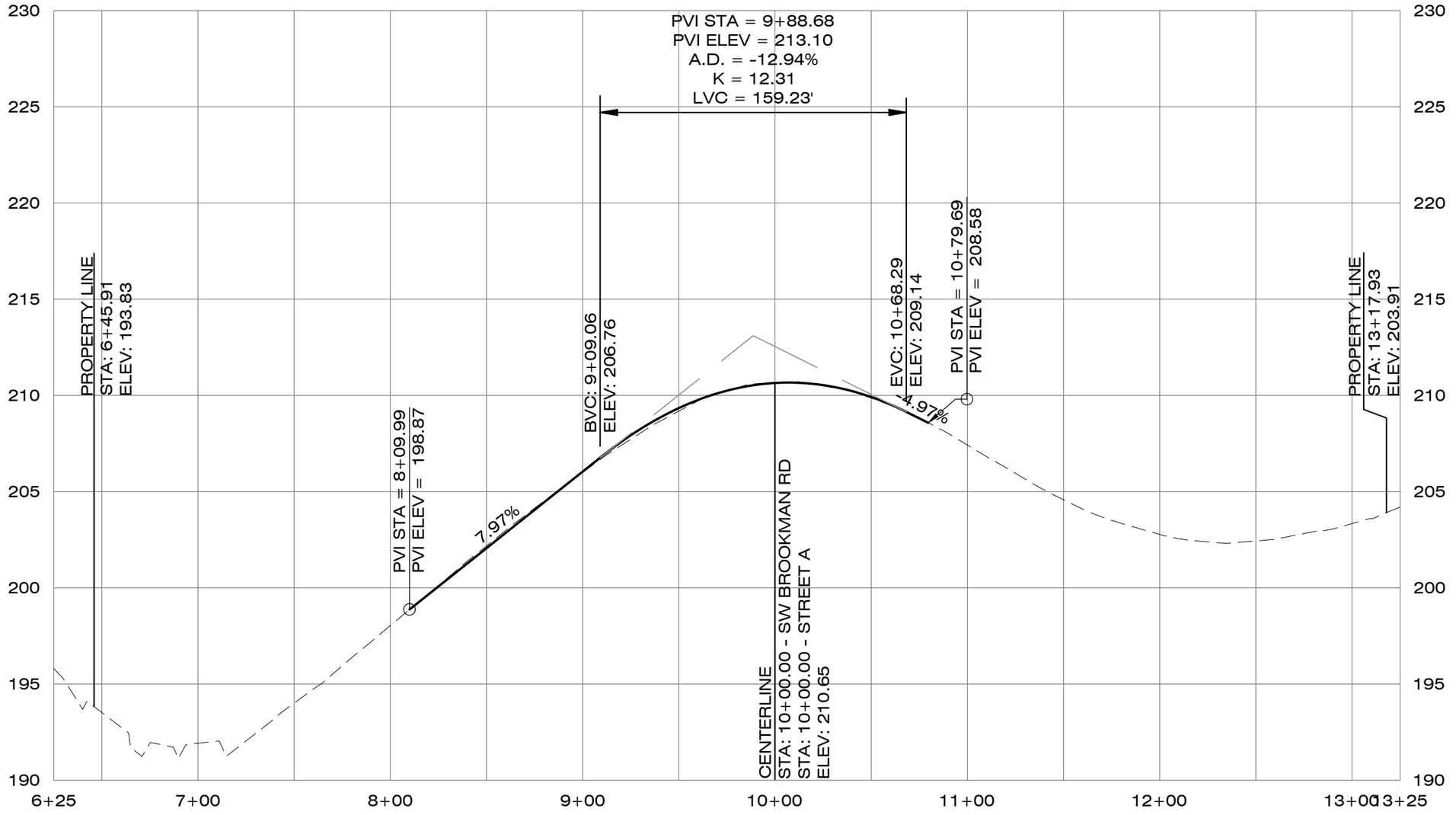
2 of 5

Exhibit A22

BROOKMAN ROAD EXHIBIT - 25 MPH DESIGN (EXISTING CONDITION)

CEDAR CREEK GARDENS



SW BROOKMAN ROAD DESIGN - PROFILE

SCALE: 1"=60' (H), 1"=6' (V)

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Designed by	CFS	Date 09/2021
Drawn by	CFS	Date 09/2021
Reviewed by	BEF	Date 09/2021
Project No.	285-021	REF.
Horiz. Scale:		
Vert. Scale:		

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3 of 5

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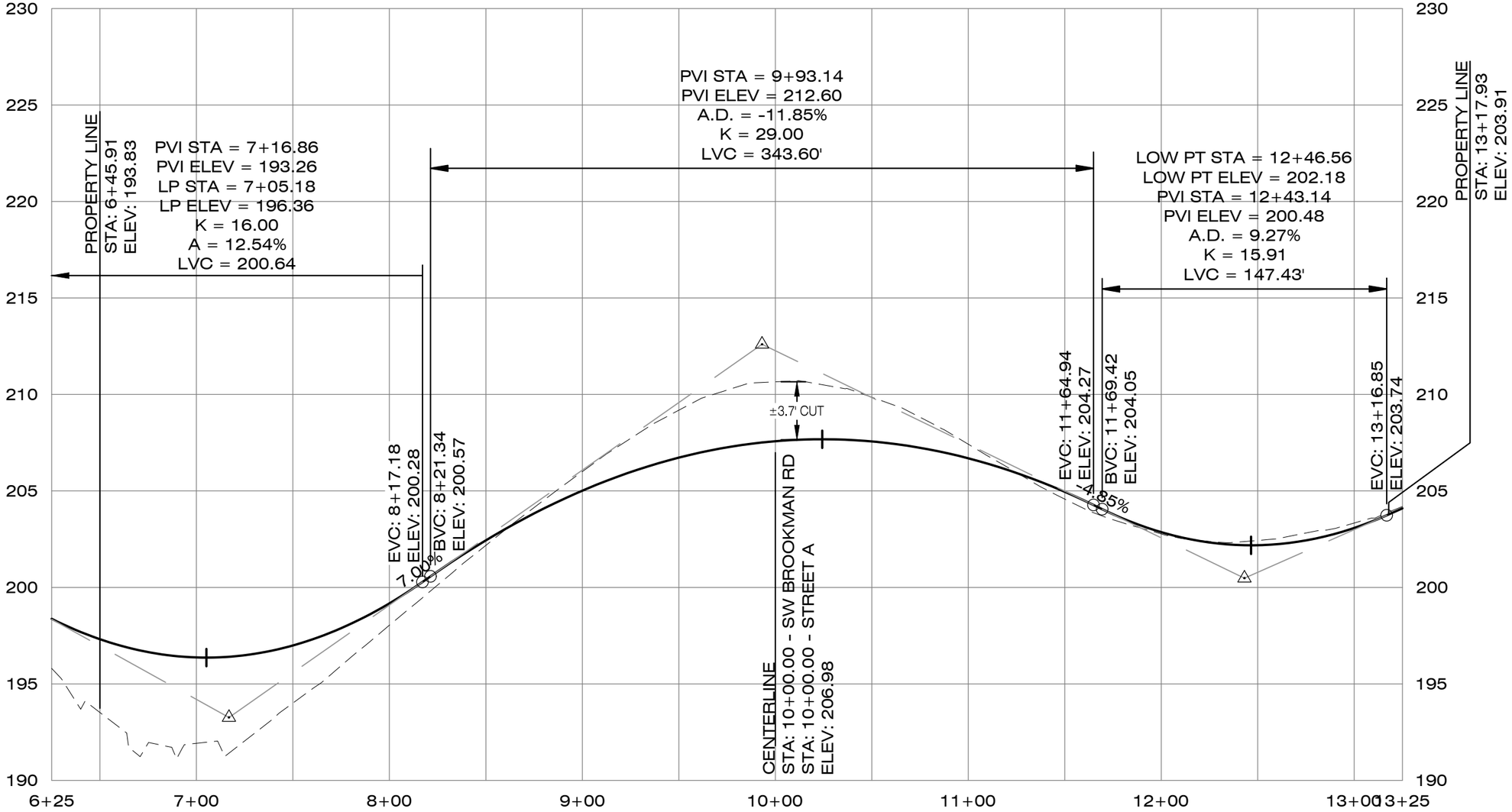
Exhibit A22

BROOKMAN ROAD EXHIBIT - 35 MPH DESIGN (FUTURE CONDITION)

CEDAR CREEK GARDENS



SW BROOKMAN ROAD UTIMATE DESIGN - PROFILE

SCALE: 1"=60' (H), 1"=6' (V)

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Reviewed by	BEF	Date	09/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

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285-021

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Sheet
4 of 5

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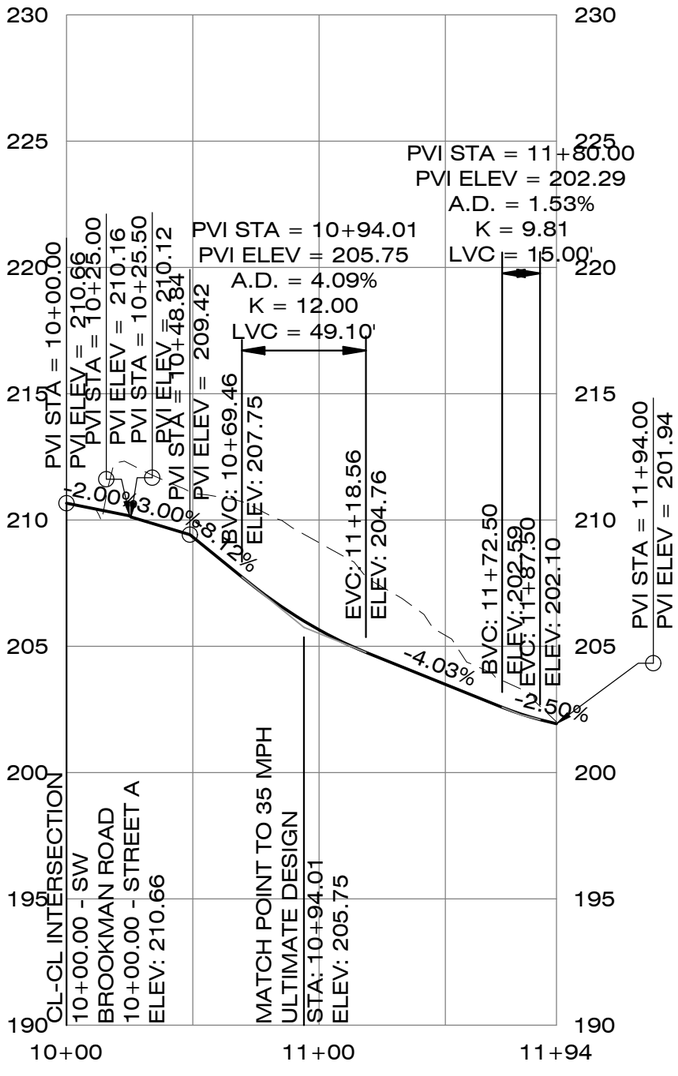
Exhibit A22

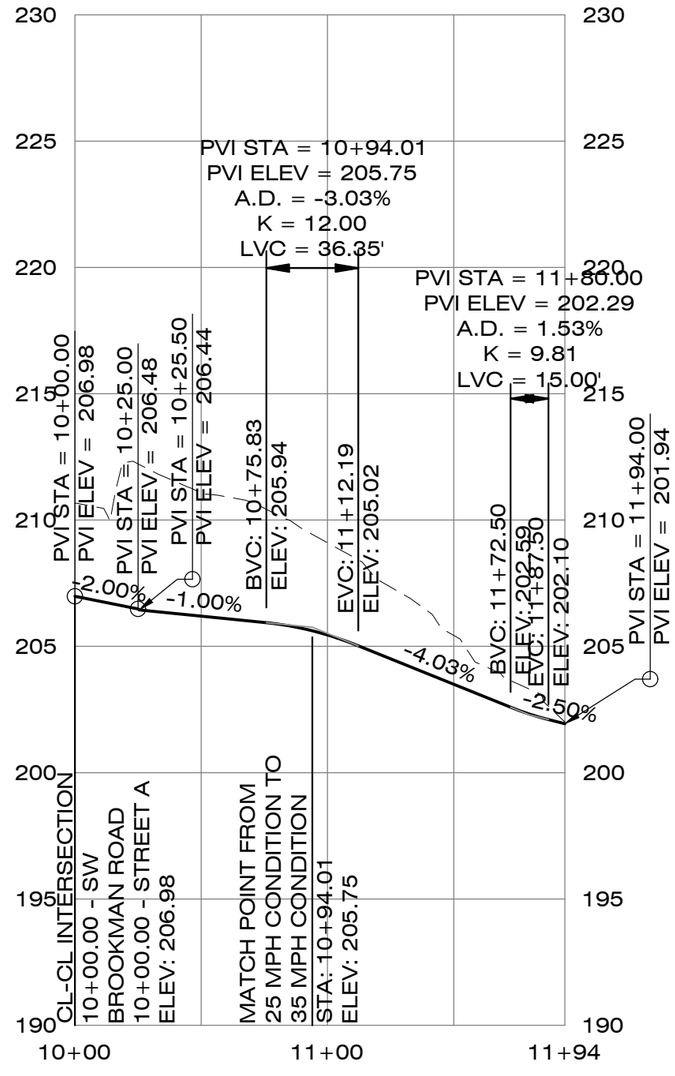
BROOKMAN ROAD EXHIBIT - STREET A

CEDAR CREEK GARDENS



STREET A DESIGN - PROFILE

SCALE: 1"=60' (H), 1"=6' (V)
MATCHING INTO EXISTING CONDITION (25 MPH)



STREET A ULTIMATE - PROFILE

SCALE: 1"=60' (H), 1"=6' (V)
AS A RESULT OF 35 MPH DESIGN

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Designed by	CFS	**Date**	09/2021
Drawn by	CFS	**Date**	09/2021
Reviewed by	BEF	**Date**	09/2021
Project No.	285-021	**REF.**	
Horiz. Scale:			
Vert. Scale:			

BROOKMAN EXHIBIT.DWG

Project
CEDAR CREEK GARDENS

No.
285-021

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Design Modification Request to Exceed the Maximum Spacing Between Intersections Along Street "B" Between Street "A" and the East Property Line – Section 210.6.E.

LU 2021-023 SUB Cedar Creek Garden Completeness Review – January 13th, 2022

To: Bob Galati, P.E. – City Engineer
Through: Craig Christensen, P.E. – City Project Manager
From: Brent Fitch, P.E. – Principal
PDG Project Number: 285-021

Location of Requested Design Modification

SW Brookman Road, a County arterial street, is located along the southern boundary of the site. Proposed Street "A" provides access to the site from SW Brookman Road, further intersecting with Proposed Street "B", which in turn serves proposed Lots 9 – 39 before terminating as a street stub at the eastern shared boundary with Tax Lot 105 (Exhibit A – Sheet P.3.0., Preliminary Plat).

Current Standards

Section 210.6.E. of the City of Sherwood Engineering Manual requires full access intersection spacing of a maximum of 530 feet for local streets.

Section 210.6.E.3. of the City of Sherwood Engineering Manual states "Provide full street connections with spacing of no more than 530 feet between connections except where prohibited by barriers."

Section 210.6.E.4. of the City of Sherwood Engineering Manual states "Provide bike and pedestrian access ways in-lieu-of streets with spacing of no more than 330 feet except where prevented by barriers."

Design Modification Being Requested

We are requesting that no additional connections are required between Street "A" and the eastern shared boundary with Tax Lot were 105.

Existing Conditions

The site includes a number of restricting topographic features, including the Cedar Creek channel and the associated broad floodplain flowing through the site, from the west central site boundary to the northeast site boundary. Two unnamed intermittent tributaries to Cedar Creek have shallower topographic relief and enter the site near the southwest and southeast site corners, providing a narrow corridor to access the site between the two, and sloping down within relatively broad, flat topography to the north at about 2% before reaching the Cedar Creek floodplain elevation. Between the tributaries is a higher ridge of forested area that also slopes down from the southern site boundary to the north at about 5% (Exhibit A – Fig. 3, Existing Conditions Map).

Result of Meeting Standards

Section 210.6.E.3. of the City of Sherwood Engineering Manual includes a provision to allow for exceptions to the street connections required above where such connections are prohibited by barriers.

The development site meets the requirements for an exception to the maximum intersection spacing standards on the basis that the presence of topographical features including stream channels, wetlands, and 100-year flood plain mean that additional connections cannot be reasonably provided without substantial impacts to significant natural resources. In addition, approved development to the west does not provide a stub street or pedestrian connection at locations which facilitate additional connections, also due to the location of topographical features. As such, additional street connections are unwarranted, and may ultimately cause the denial of the application through a negative Sensitive Area Service Provider Letter from Clean Water Services due to unnecessary permanent impacts to the resource.

Proposed Design Modification

No additional connections be required shall be required on Street "B" between Street "A" and the eastern shared boundary with Tax Lot were 105.

Reason Why Design Request Should be Approved

As proposed, the site plan provides needed pedestrian connections to the community trails within the site in order to provide connections to existing and approved access points. No street connections are required to the west as no existing or approved street stubs exist, and connectivity is provided to the east through the street stub to Tax Lot 105. The proposed plan provides these connections while avoiding and/or minimizing permanent impacts to surrounding significant natural resources.

Brent Fitch, P.E. – Principal — Date: 1-13-2022

Craig Christensen, P.E. - City Project Manager — Date

- ❑ Approved
- ❑ Approved with Conditions (conditions below or on attached sheet)
- ❑ Denied

Bob Galati, P.E. - City Engineer — Date

Exhibit A – Sheet P3.0, Preliminary Plat
Exhibit B – Fig. 3., Existing Conditions Plan

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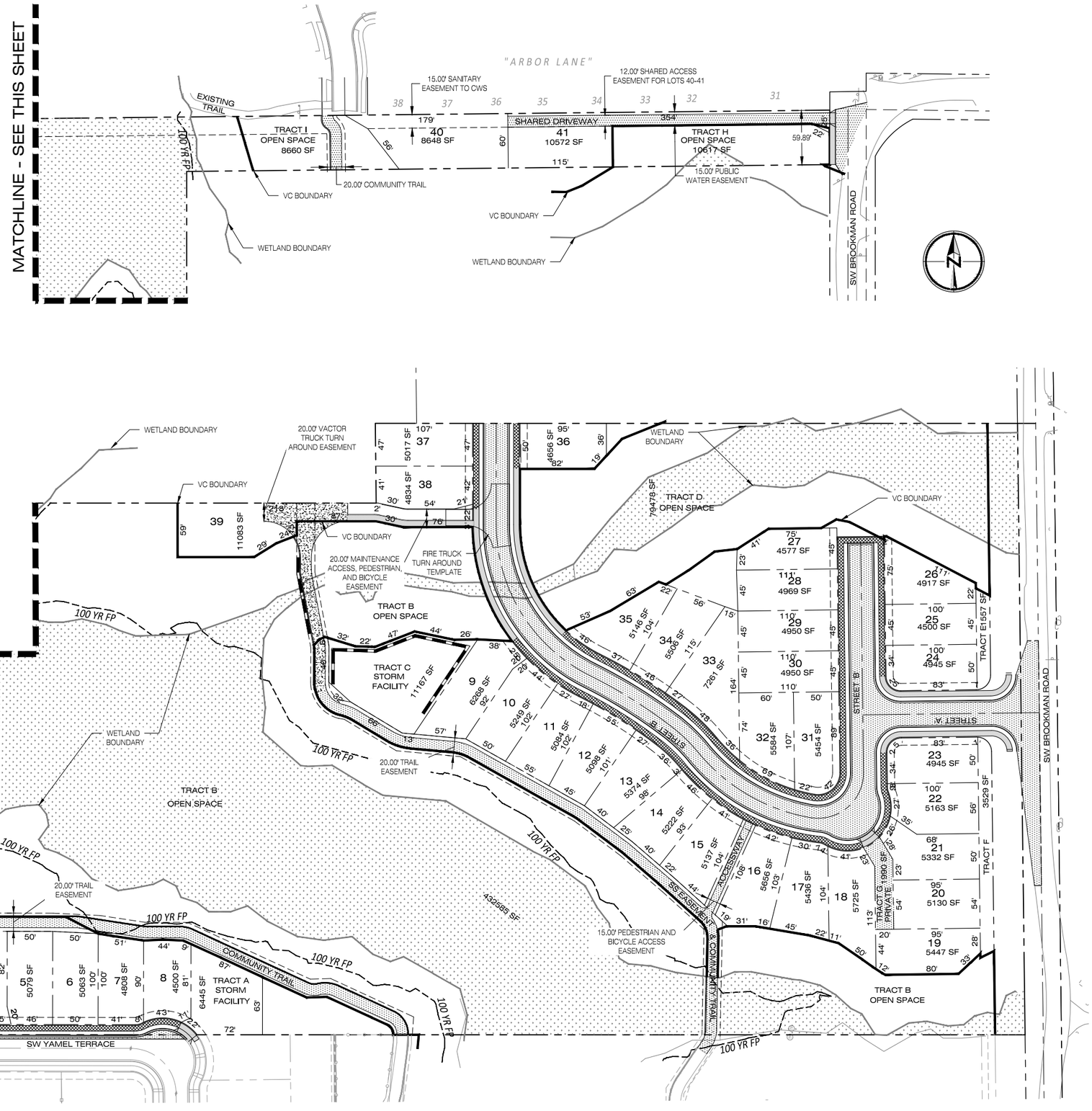
Exhibit A – Sheet P3.0, Preliminary Plat

Exhibit A23



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PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

	By	Date	Revision
No.			

Designed by MLS Date 08/2021
Drawn by CFS Date 08/2021
Reviewed by MLS Date 08/2021
Project No. 285-021 REF.
Horiz. Scale:
Vert. Scale:
28521_P3.0plat.dwg

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.0

SCALE
60 0 30 60
1 INCH = 60 FEET

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Exhibit B – Fig. 3., Existing Conditions Plan

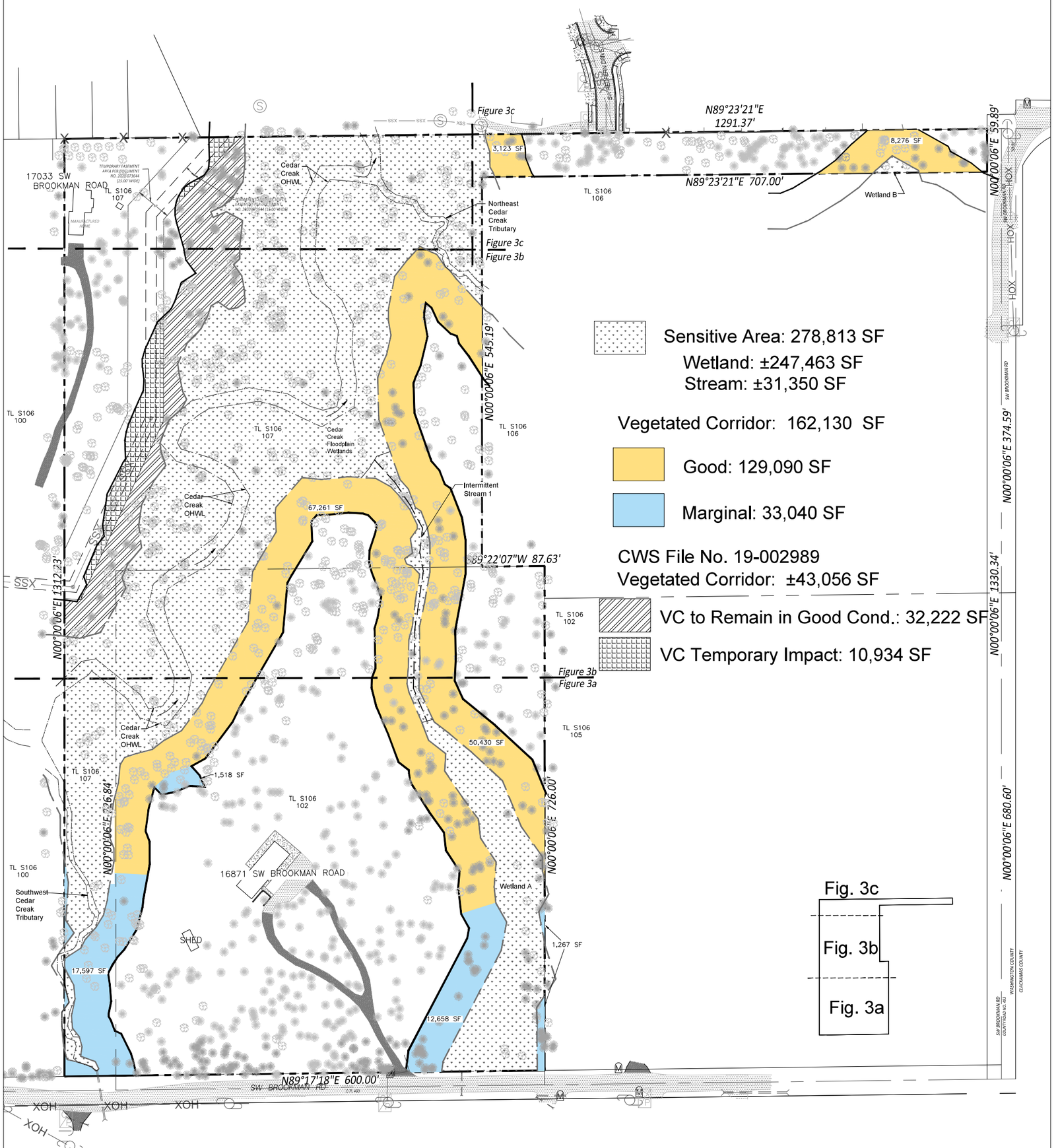

Fig. 3

Existing Conditions Map
Cedar Creek Gardens
Sherwood, Oregon

N
1"=140'
0 75 140

Base Map Source: Pioneer Design Group, Inc.
Mod. By: KR
Date: 10/21
Job: 21004
Rev: 00/00

Environmental Science & Assessment, LLC

4831 NE Fremont St.
Suite 2B
Portland, OR 97213
Phone: 503.478.0424
www.esapdx.com

Exhibit A23

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Portland, Oregon 97223

Design Modification Request to Reduce the Minimum Length of Road Between Intersections between SW Brookman Road and Street 'B' – Section 210.6.E.

LU 2021-023 SUB Cedar Creek Garden Completeness Review – January 13th, 2022

To: Bob Galati, P.E. – City Engineer
Through: Craig Christensen, P.E. – City Project Manager
From: Brent Fitch, P.E. – Principal
PDG Project Number: 285-021

Location of Requested Design Modification

SW Brookman Road, a County arterial street, is located along the southern boundary of the site. Proposed Street "A" provides access to the site from SW Brookman Road, and in turn intersects with Proposed Street "B" 194 feet north of SW Brookman Road (centerline of SW Brookman Road to centerline of Street "B"). Street "A is proposed as a local street.

Current Standards

Section 210.6.E. of the City of Sherwood Engineering Manual requires full access intersection spacing of a minimum of 200 feet for local streets.

Section 210.6.E.1. of the City of Sherwood Engineering Manual states "Distance between streets is measured from the centerline of the subject street to the centerline of the adjacent street."

Design Modification Being Requested

We are requesting that a spacing of 194 feet between intersections be approved for Street "A" between SW Brookman Road and Street "B".

Existing Conditions

The site includes a number of restricting topographic features, including the Cedar Creek channel and the associated broad floodplain flowing through the site, from the west central site boundary to the northeast site boundary. Two unnamed intermittent tributaries to Cedar Creek have shallower topographic relief and enter the site near the southwest and southeast site corners, providing a narrow corridor to access the site between the two, and sloping down within relatively broad, flat topography to the north at about 2% before reaching the Cedar Creek floodplain elevation. Between the tributaries is a higher ridge of forested area that also slopes down from the southern site boundary to the north at about 5% (Exhibit A – Fig. 3, Existing Conditions Map).

Result of Meeting Standards

To meet the 200-foot minimum intersection spacing, Street "A" would be required to be extended to the north by 6 feet, with Street "B" also being required to move a corresponding 6 feet to the north. The site is severely impacted by the presence of significant natural resource areas, with only 6.82 acres of the total 20.03 acres (34%) of the site available for development. As a result, any relocation of Streets "A" or "B" will be required to be accommodated within the proposed lots, in order to avoid permanent impacts to the adjoining resource areas and 100-year floodplain. On the north side of Street "B", any alteration to the location of the street would reduce Lot 27 below 4,500 square feet (currently 4,577 square feet), which is below the minimum lot size allowed including a 10% adjustment. Lots 28, 29, and 30 are also proposed at

below 5,000 square feet and would be further reduced in size, while Lot 31 would be reduced below the minimum lot width, again including the maximum 10% reduction allowed. Any alterations to the site plan to distribute these impacts across lots to the north would have a similar, cascading impact on the ability of those lots to comply with the required standards of the Sherwood Zoning and Community Development Code (SZCDC) (Exhibit B – Sheet P3.0, Preliminary Plat), and ultimately result in the loss of lots from the development.

In addition to the above, the extension of Steet "A" by 6 feet and the associated relocation of Street "B" would impact the inside corner radius of the proposed eyebrow corner, and result in further cascading changes to the lots to the north over and above the changes which would already be required. Such revisions would ultimately result in a further loss of density on an already constrained site.

Proposed Design Modification

The 200-foot minimum full access intersection spacing for local streets would be reduced to 194 feet between intersections for Street "A" between SW Brookman Road and Street "B".

Reason Why Design Request Should be Approved

Due to the existing conditions on-site, the modification represents an appropriate balance between compliance with these Engineering Design Standards, the SZCDC, and other jurisdictional requirements for the preservation of significant natural resources. In turn, the Traffic Impact Assessment prepared for the site by Lancaster Mobley (Exhibit C – Cedar Creek Gardens Subdivision Transportation Impact Analysis), and which studied the operation of the intersection of SW Brookman Road and Street "A", found that "All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision".

Brent Fitch, P.E. - Design Engineer — 1.13.2022 Date

Craig Christensen, P.E. - City Project Manager — Date

- ❑ Approved
- ❑ Approved with Conditions (conditions below or on attached sheet)
- ❑ Denied

Bob Galati, P.E. - City Engineer — Date

Exhibit A – Fig. 3., Existing Conditions Plan
Exhibit B – Sheet P3.0, Preliminary Plat
Exhibit C – Cedar Creek Gardens Subdivision Transportation Impact Analysis

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Portland, Oregon 97223

Exhibit A – Fig. 3., Existing Conditions Plan

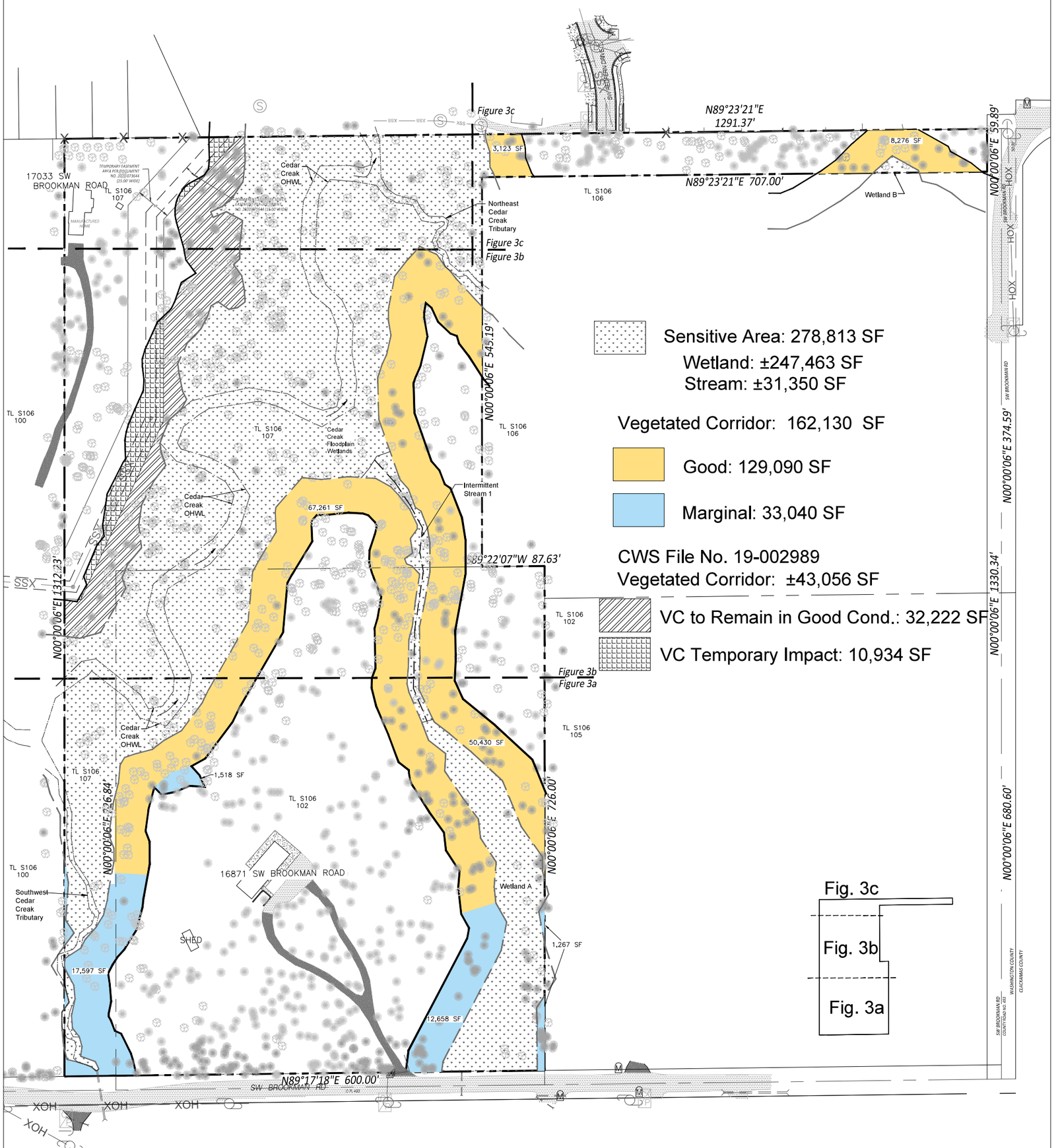

Fig. 3

Job: 21004
Rev: 00/00
Date: 10/21
Mod. By: KR
Base Map Source: Pioneer Design Group, Inc.

N
1"=140'
0 75 140

Existing Conditions Map
Cedar Creek Gardens
Sherwood, Oregon

Environmental Science & Assessment, LLC
4831 NE Fremont St.
Suite 2B
Portland, OR 97213
Phone: 503.478.0424
www.esapdx.com

Exhibit A24

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Portland, Oregon 97223

Exhibit B – Sheet P3.0, Preliminary Plat

Exhibit A24

MATCHLINE - SEE THIS SHEET

"ARBOR LANE"

EXISTING TRAIL

100 YR FP

TRACT I
OPEN SPACE
8660 SF

15.00' SANITARY EASEMENT TO CWS

12.00' SHARED ACCESS EASEMENT FOR LOTS 40-41

SHARED DRIVEWAY

38 37 36 35 34 33 32 31

40
8648 SF

41
10572 SF

TRACT H
OPEN SPACE
10617 SF

179'
56'
60'
115'
354'
59.89'
25'

20.00' COMMUNITY TRAIL

VC BOUNDARY

WETLAND BOUNDARY

15.00' PUBLIC WATER EASEMENT

SW BROOKMAN ROAD

N

WETLAND BOUNDARY

20.00' VACTOR TRUCK TURN AROUND EASEMENT

39
11083 SF

37
5017 SF
107'

38
4834 SF

36
4656 SF
95'

82'

TRACT D
OPEN SPACE
79478 SF

VC BOUNDARY

FIRE TRUCK TURN AROUND TEMPLATE

20.00' MAINTENANCE ACCESS, PEDESTRIAN, AND BICYCLE EASEMENT

TRACT B
OPEN SPACE

27
4577 SF

28
4969 SF

29
4950 SF

30
4950 SF

26
4917 SF

25
4500 SF

24
4945 SF

TRACT E
557 SF

35
5146 SF

34
5506 SF

33
726 SF

TRACT C
STORM FACILITY
11167 SF

9
6268 SF

10
5249 SF

11
5085 SF

12
5098 SF

13
5374 SF

14
5222 SF

15
5137 SF

16
5656 SF

17
5436 SF

18
5725 SF

32
5584 SF

31
5454 SF

STREET 'B'

STREET 'A'

23
4945 SF

22
5163 SF

21
5332 SF

20
5130 SF

19
5447 SF

3529 SF

TRACT F

TRACT G
1990 SF
PRIVATE ACCESSWAY

15.00' PEDESTRIAN AND BICYCLE ACCESS EASEMENT

TRACT B
OPEN SPACE

MATCHLINE - SEE THIS SHEET

20.00' TRAIL EASEMENT

WETLAND BOUNDARY

TRACT 'A'

TRACT B
OPEN SPACE

VC BOUNDARY

100 YR FP

20.00' TRAIL EASEMENT

3
7391 SF

2
5822 SF

1
4964 SF
104'

4
5756 SF

5
5079 SF

6
5063 SF

7
4808 SF

8
4500 SF

TRACT A
STORM FACILITY
6445 SF

COMMUNITY TRAIL

SW YAMEL TERRACE

69 70 71 72

SCALE
60 0 30 60
1 INCH = 60 FEET

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PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P3.0plat.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.0

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P 503.643.8286 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

Exhibit C – Cedar Creek Gardens Subdivision Transportation Impact Analysis

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Cedar Creek Gardens Subdivision

Transportation Impact Analysis

Sherwood, Oregon

Date:
November 10, 2021

Prepared for:
Westwood Homes, LLC

Prepared by:
Jennifer Danziger, PE

REGISTERED PROFESSIONAL ENGINEER
16168
Digitally signed by Jennifer Danziger
Date: 2021.11.10 13:52:55-08'00'
OREGON
SEPT. 15, 1992
JENNIFER ELISE DANZIGER

RENEWS: 12/31/2021

List of Figures

List of Tables

Executive Summary

1. The proposed Cedar Creek Gardens subdivision will redevelop the properties located at 16871 and 17033 SW Brookman Road in Sherwood, Oregon. The proposed development includes the construction of 42 single-family homes, removing two existing homes for a net increase of 40 homes. Access to the site will be provided via two public street connections and one shared driveway connection along SW Brookman Road.
2. The proposed development is projected to generate an additional 32 morning peak hour, 41 evening peak hour trips, and 426 weekday trips.
3. No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. A review of existing sight lines and elevation profiles from Google Earth show that adequate sight distance can be available if the roadside vegetation is cleared with the development. Both the intersection sight distance and stopping sight distance can be met at the main site access and the shared driveway.
5. Left-turn lane warrants are not projected to be met at the site access intersection along SW Brookman Road upon completion and occupancy of the proposed development. Accordingly, installation of a left-turn lane at the site access intersection is not necessary or recommended.
6. All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.
7. Because the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both peak hours under all scenarios, agencies may wish to consider restriping the eastbound approach to provide a through and a right-turn lane. This change would eliminate occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping. The change is not necessary to accommodate the proposed development.
8. *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019, identified four intersections as currently exceeding acceptable jurisdictional standards. Based on the projected site trip impacts to these intersections, a total proportionate share fee to mitigate impacts of $69,274.39 was calculated.

Project Description

Introduction

This report describes and evaluates the transportation impacts associated with the proposed Cedar Creek Gardens subdivision located at 16871 and 17033 SW Brookman Road in Sherwood, Oregon. The proposed development includes the construction of 42 single-family homes, removing two existing homes for a net increase of 40 homes. Access to the site will be provided via two public street connections and one shared driveway connection along SW Brookman Road.

Based on correspondence with the City of Sherwood, a safety and capacity/level of service analysis was conducted at the following intersections:

1. SW Elwert Road/SW Sunset Boulevard at Highway 99W
2. SW Brookman Road at Highway 99W
3. SW Brookman Road at Middlebrook Site Access
4. SW Brookman Road at Main Site Access
5. SW Brookman Road at North Site Access

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The subject site is located at 16871 and 17033 SW Brookman Road and is situated adjacent to one in-process residential subdivision project: The Reserve at Cedar Creek. The site is located north of SW Brookman Road with The Reserve to the west. The subject property consists of two tax lots (3S10600 00107 and 00102) totaling approximately 20 acres. Each lot has an existing single-family house on the property which will be removed upon development.

Figure 1 displays a vicinity map of the project site, with the project site hatched and outlined in yellow. Other adjacent approved developments are shown in red, blue, and cyan. The future street network is represented with white. A site plan depicting the proposed project is provided in the appendix.

The site will take access from two public street connections and one shared driveway connection along SW Brookman Road. Eight (8) of the proposed homes will have driveways connecting to a roadway to be constructed as part of The Reserve subdivision. Their access to SW Brookman Road will be via a new roadway (SW White Oak Terrace) to be constructed as part of the Middlebrook subdivision. Thirty-one (31) of the proposed homes will access SW Brookman Road via a new roadway constructed with the subject subdivision. Three (3) of the proposed homes will share a driveway that will connect to SW Brookman Road at the northeast corner of the site.

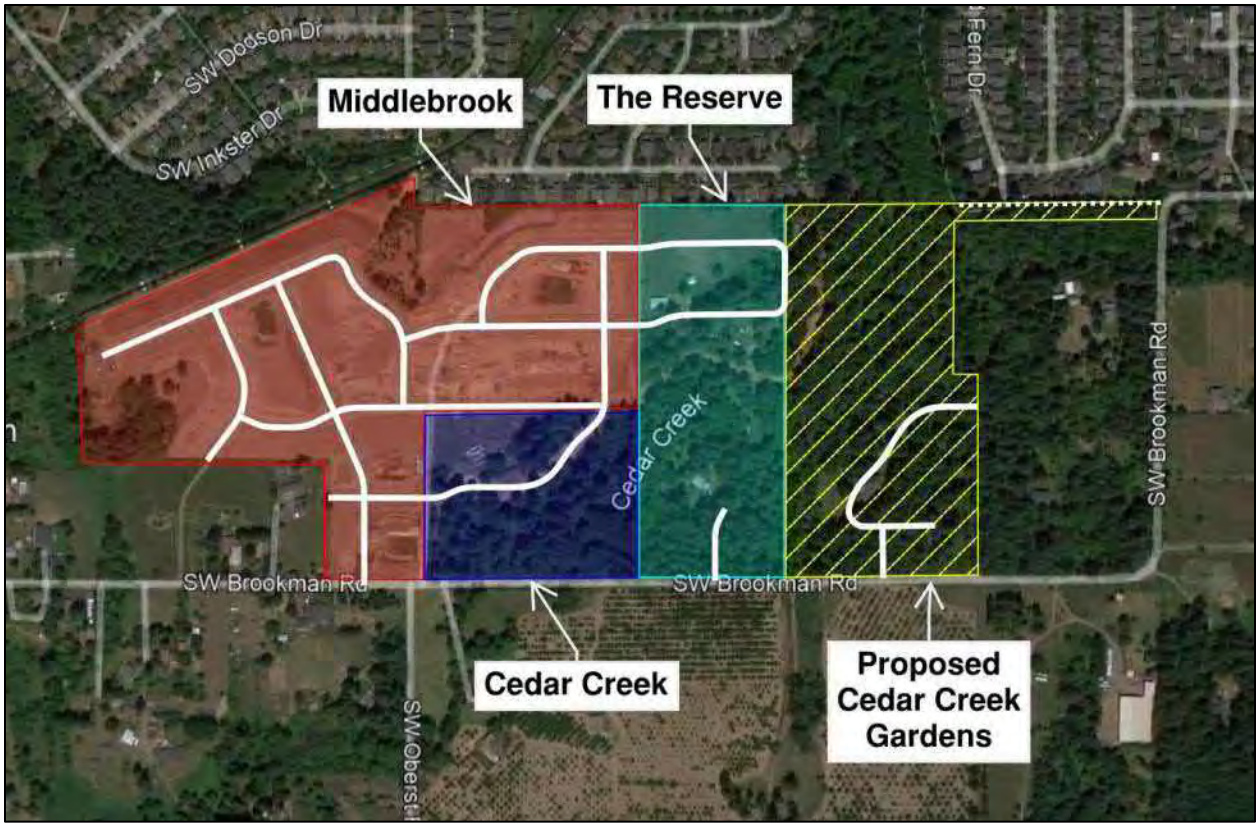


Figure 1: Project Location (image from Google Earth)

Vicinity Roadways

The proposed development is expected to impact three vicinity roadways. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Roadway	Jurisdiction	Functional Classification	Cross-Section	Speed (mph)	On-street Parking	Bicycle Lanes	Curbs & Sidewalks
Highway 99W	ODOT	Principal Arterial	4 Lanes	45-55 Posted	Not Permitted	Partial Both Sides	None
SW Elwert Rd/ SW Sunset Blvd	City of Sherwood	Arterial	2 to 3 Lanes	35 Posted	Not Permitted	Both Sides	Both Sides
SW Brookman Rd	Washington County	Arterial	2 Lanes	25/35/55 Posted/ Statutory	Not Permitted	None	None

Notes: Functional Classification based on the City of Sherwood Transportation System Plan

Study Intersections

The proposed development is expected to impact three vicinity intersections of significance. A summarized description of the study intersections is provided in Table 2.

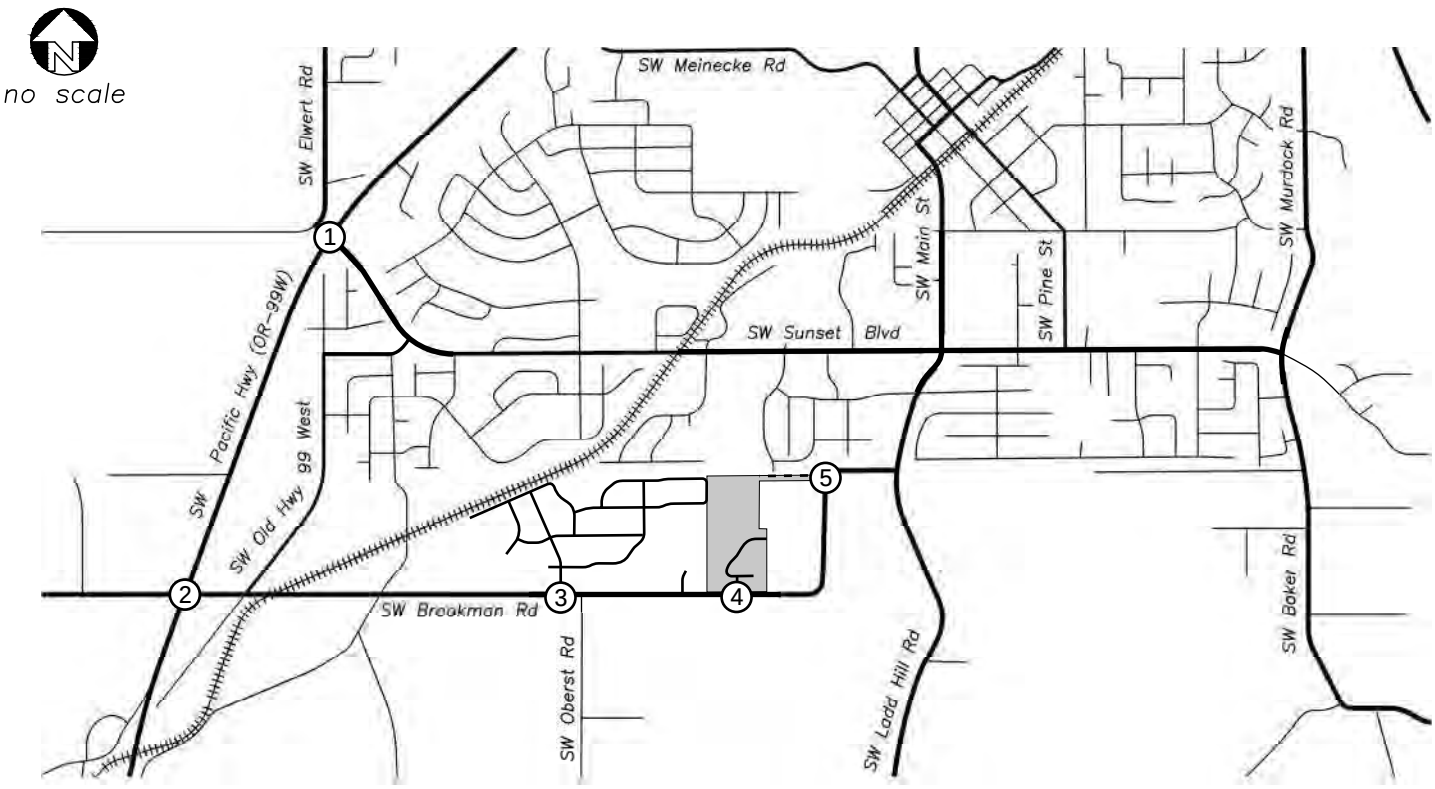
Table 2: Study Intersection Descriptions

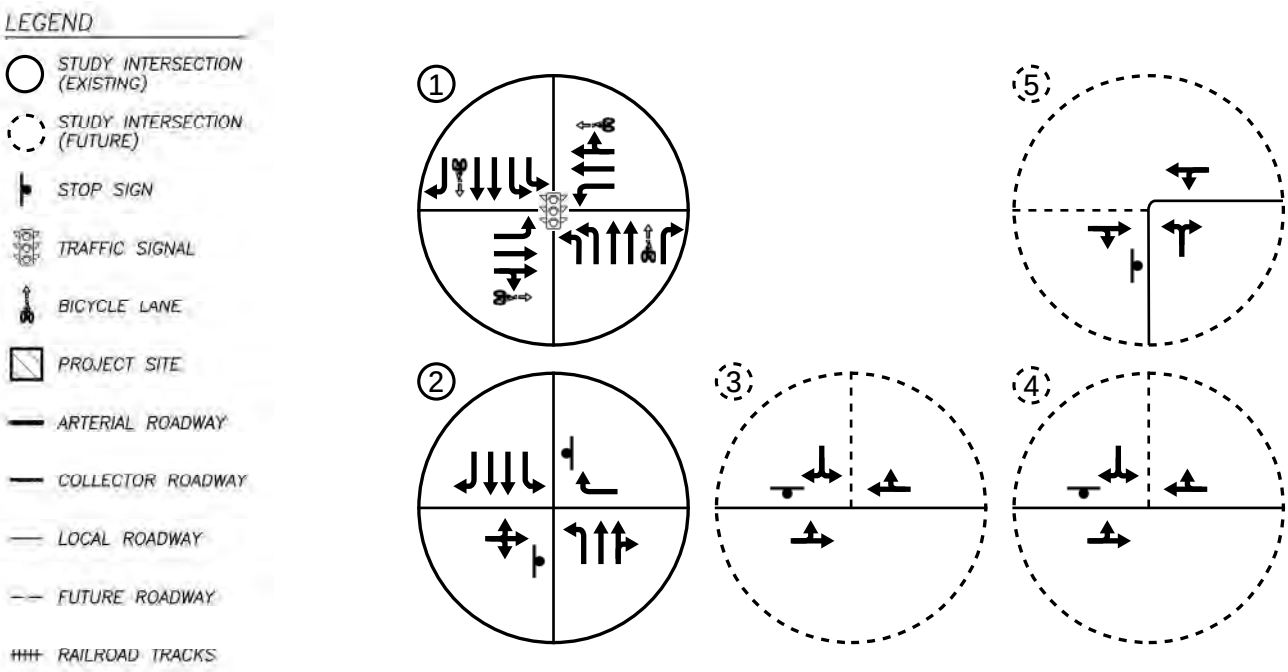
Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	SW Elwert Rd/SW Sunset Blvd at Highway 99W	Four-Legged	Signalized	WB/EB Permitted LT, NB/SB Protected LT
2	SW Brookman Rd at Highway 99W	Four-Legged	Stop-Controlled	EB/WB Stop Controlled Approach
3	SW Brookman Rd at Site Access	Three-Legged (Future)	Stop-Controlled	SB Stop Controlled Approach

A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.

Transit

No nearby transit service is available near the proposed development.





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VICINITY MAP &
LANE CONFIGURATIONS

Figure 2
Cedar Creek Gardens
11/10/2021

Site Trips

Trip Generation

The proposed development includes the construction of 42 single-family homes. As part of the proposed development, two existing single-family homes will be removed for a net increase of 40 homes.

To estimate the number of site trips generated under existing and proposed conditions, trip rates from the *Trip Generation Manual*[1] were used. Specifically, the equations from land-use codes 210, *Single-Family Detached Housing*, were used based on the number of dwelling units.

As shown in Table 3, the trip generation calculations show that the proposed development is projected to generate an additional 32 morning peak hour, 41 evening peak hour trips, and 426 weekday trips. Detailed trip generation calculations are included in the technical appendix.

Table 3: Trip Generation Summary

Land Use	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
Proposed Development	210	42 DU	9	25	34	28	16	44	454
Existing Homes	*210*	*2 DU*	*-1*	*-1*	*-2*	*-2*	*-1*	*-3*	*-28*
Net New Site Trips			**8**	**24**	**32**	**26**	**15**	**41**	**426**

Trip Distribution

The directional distribution of site trips to/from the project site was referenced from *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019. The following trip distribution was used for analysis:

- Approximately 45 percent of site trips will travel to/from the north along Highway 99W
- Approximately 10 percent of site trips will travel to/from the north along SW Main Street
- Approximately 10 percent of site trips will travel to/from the north along SW Murdock Road
- Approximately 10 percent of site trips will travel to/from the south along Highway 99W
- Approximately 10 percent of site trips will travel to/from the south along SW Ladd Hill Road
- Approximately 10 percent of site trips will travel to/from the south along SW Baker Road
- Approximately 5 percent of site trips will travel to/from the west along SW Kruger Road

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

Four intersections were identified as exceeding acceptable operation standards in *The Reserve TIA*:

A. SW Sunset Boulevard at SW Woodhaven Drive

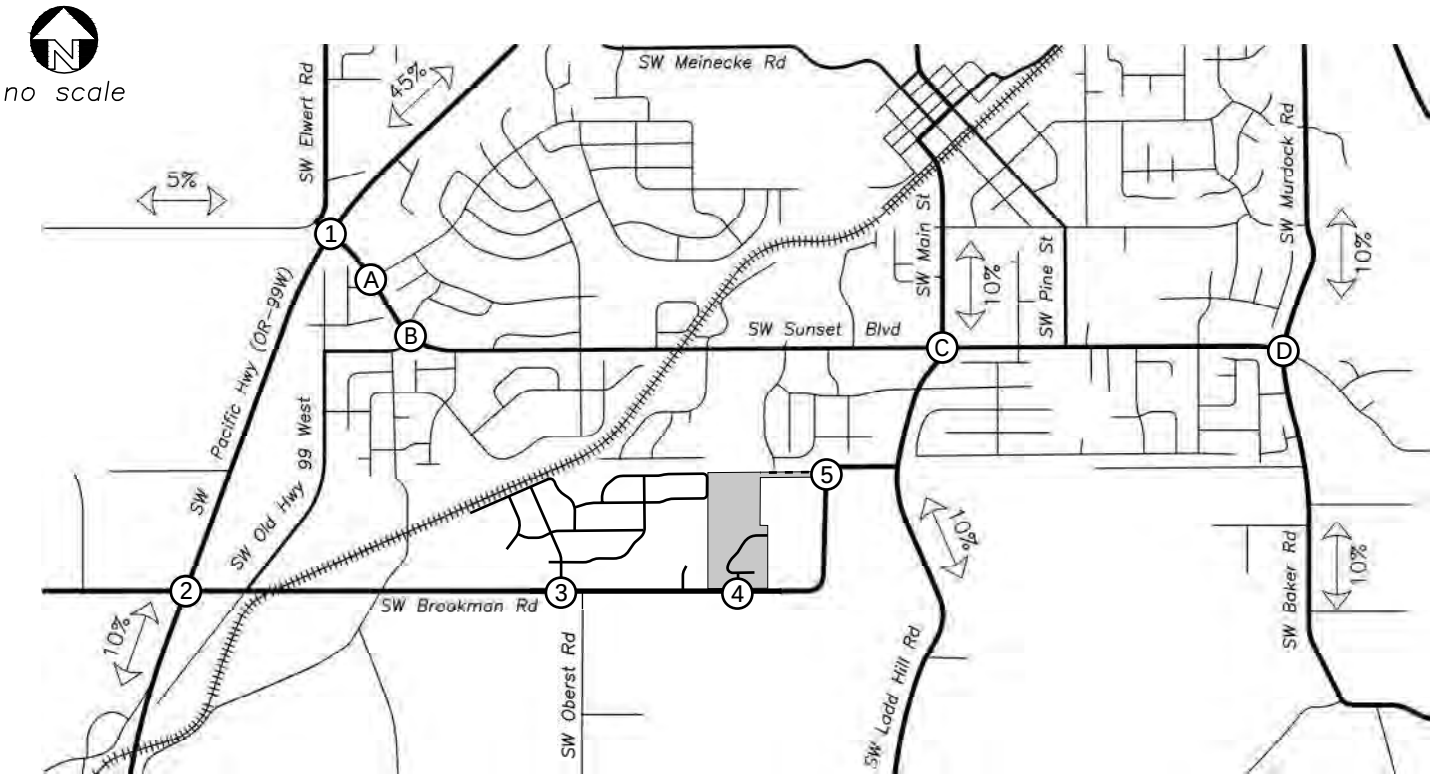
B. SW Sunset Boulevard at SW Timbrel Lane

C. SW Sunset Boulevard at SW Main Street/SW Ladd Hill Road

D. SW Sunset Boulevard at SW Murdock Road/SW Baker Road

Site trip assignment through these intersections was conducted to determine expected impacts from the proposed development to these intersections.

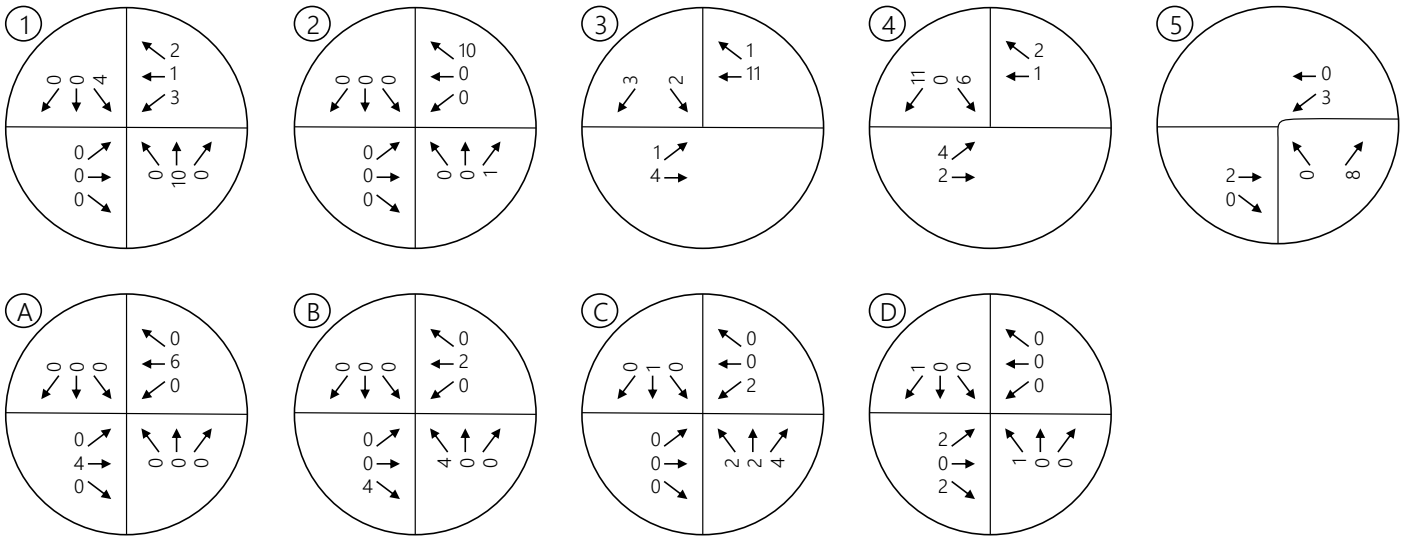
The trip assignment for site trips generated by the proposed development during is shown in Figure 3 for the morning peak hour and Figure 4 evening peak hour. This assignment reflects the layout of the proposed development with 8 homes using the Middlebrook subdivision access, 31 homes using the main site access, and 3 homes using the shared driveway.



NET TRIP GENERATION

	In	Out	Total
AM	8	24	32
PM	26	15	41
DAILY	213	213	426

AM PEAK HOUR



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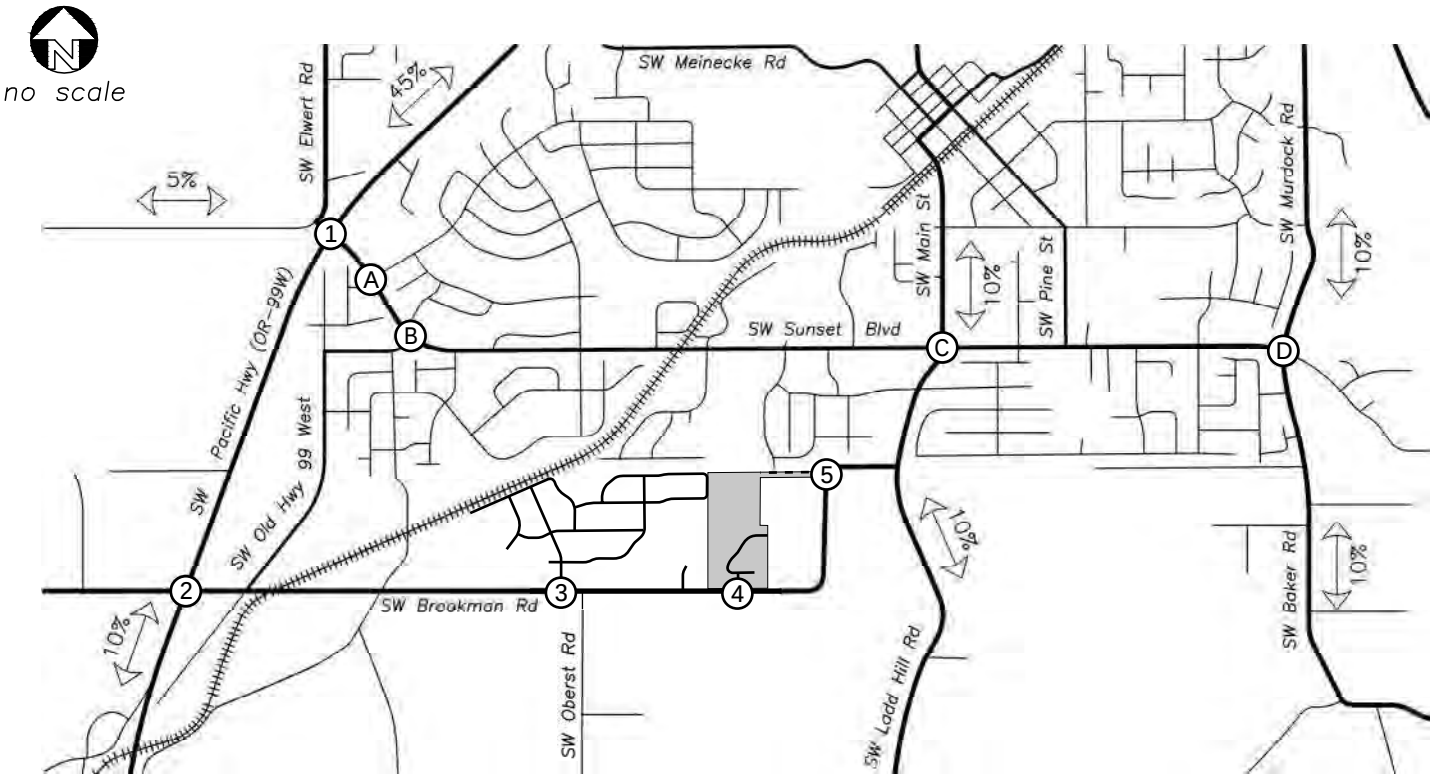
TRIP DISTRIBUTION & ASSIGNMENT - AM PEAK

TRAFFIC VOLUMES

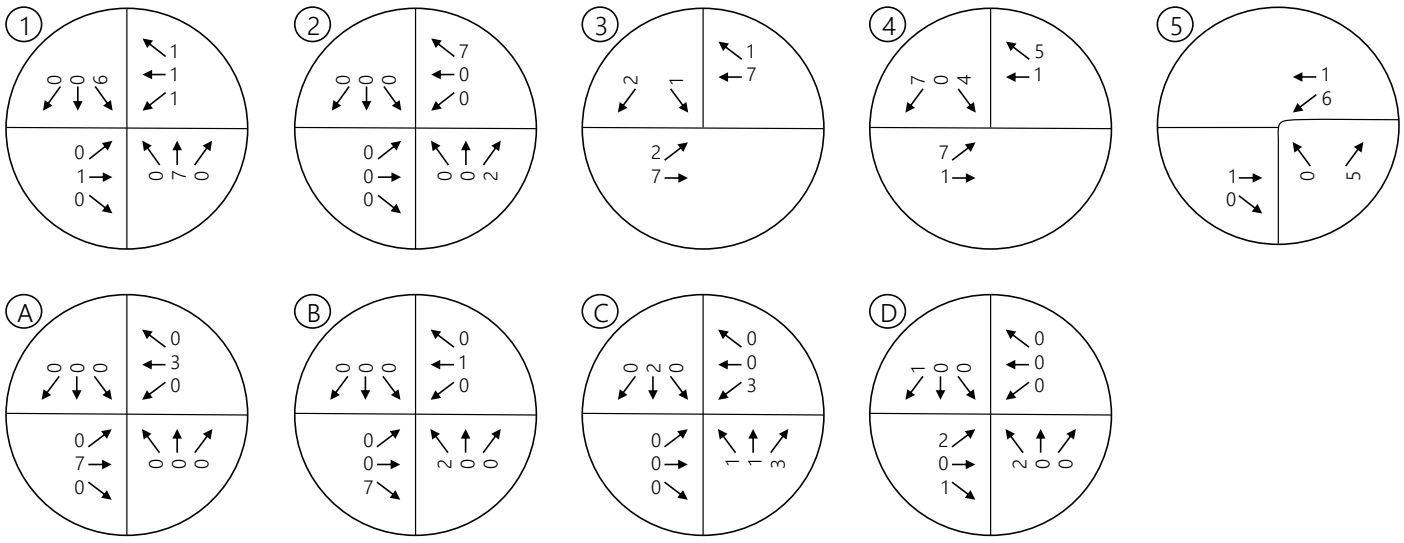
Figure 3
Cedar Creek Gardens
11/10/2021



NET TRIP GENERATION

	In	Out	Total
AM	8	24	32
PM	26	15	41
DAILY	213	213	426

PM PEAK HOUR



Traffic Volumes

Existing Conditions

Due to the ongoing COVID-19 viral pandemic, traffic volumes have been depressed relative to normal conditions since mid-March 2020. Under these conditions, traditional traffic count data collection methods are not recommended. Therefore, to estimate existing traffic conditions, year 2017 traffic count data was referenced from *The Reserve TIA*, specifically volumes from Figures 4 and 5. Consistent with background growth methodologies used in *The Reserve TIA*, the year 2017 volumes were increased by 1% annually along Highway 99W and by 2% annually on all other movements at the study intersections to reflect existing year 2021 conditions. Note, these volumes do not capture the traffic demand from Sherwood High School, which was opened in the fall of 2021.

Since the traffic counts were collected, the westbound approach of SW Brookman Road at Highway 99W has been restricted to right turns only. The westbound left-turn and through volumes have been reassigned to reflect the traffic change. Ten percent of these movement was assumed to travel northbound to the signal at SW Sunset Boulevard and then U-Turn to travel southbound. Ninety percent was assumed to travel to SW Sunset Boulevard via other routes and turn left to travel southbound.

Figure 5 shows the existing traffic volumes at study intersections during the morning and evening peak hours.

Background Conditions

To provide analysis of the impact of the proposed development on the existing transportation facilities, an estimation of future traffic volumes is required. To reflect future traffic conditions without the proposed subdivision, volumes from two studies were used to estimate the Year 2024 background traffic volumes. *Year 2024 Total Intersection Operations* (Figures 12 and 13) volumes were referenced from *The Reserve TIA* and the trip assignments from the *Cedar Creek Subdivision TIA* (Figures 2 and 3) were added to those volumes. These volumes reflect the opening of the new Sherwood High School Campus.

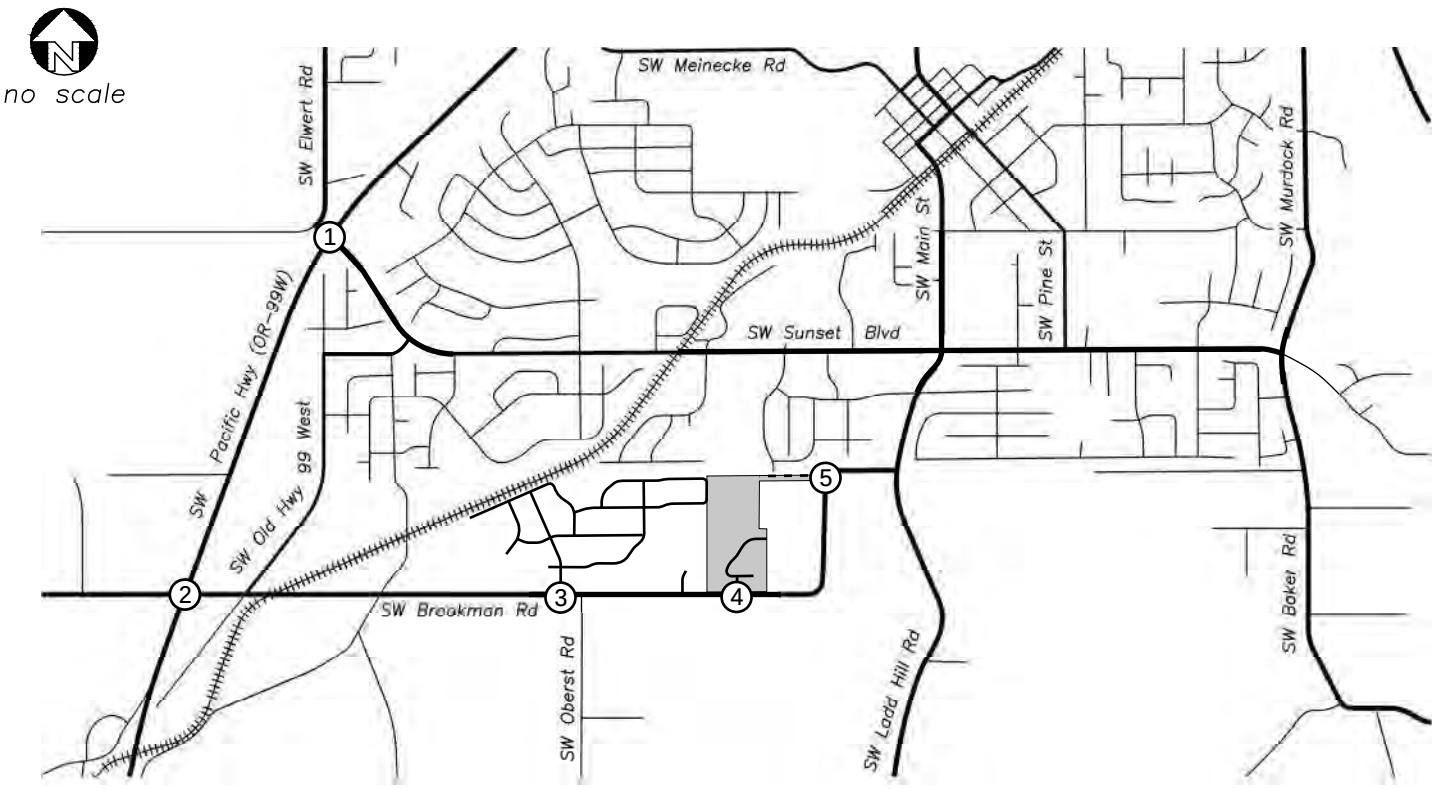
Note *The Reserve TIA* assumed additional turning movement restrictions at the intersection of SW Brookman Road at Highway 99W would be implemented by year 2024. The minor street approaches will be restricted to right-in/right-out only and U-turns along Highway 99W at the intersection would also be restricted. The volumes reflect this change.

Figure 6 shows the background traffic volumes at study intersections during the morning and evening peak hours.

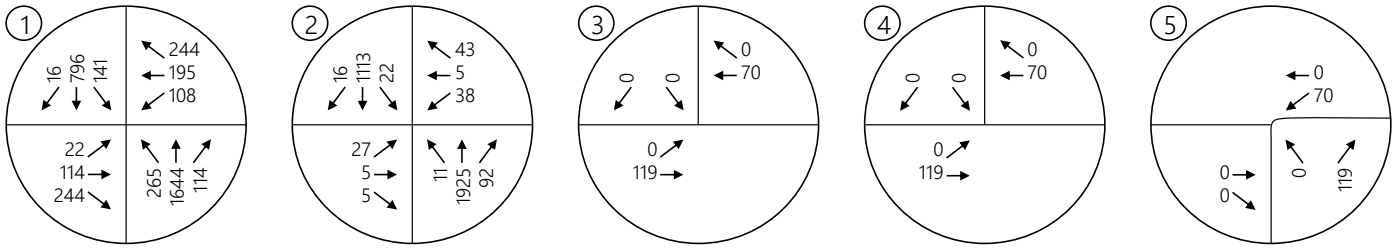
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2024 background traffic volumes to obtain the expected 2024 buildout volumes.

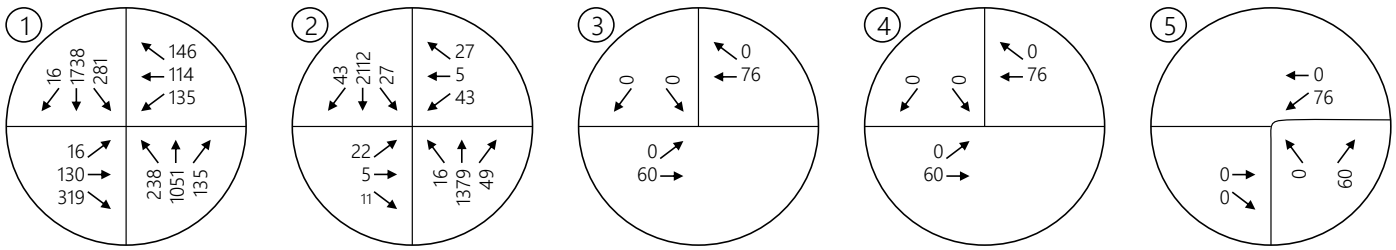
Figure 7 shows the buildout traffic volumes at study intersections during the morning and evening peak hours.



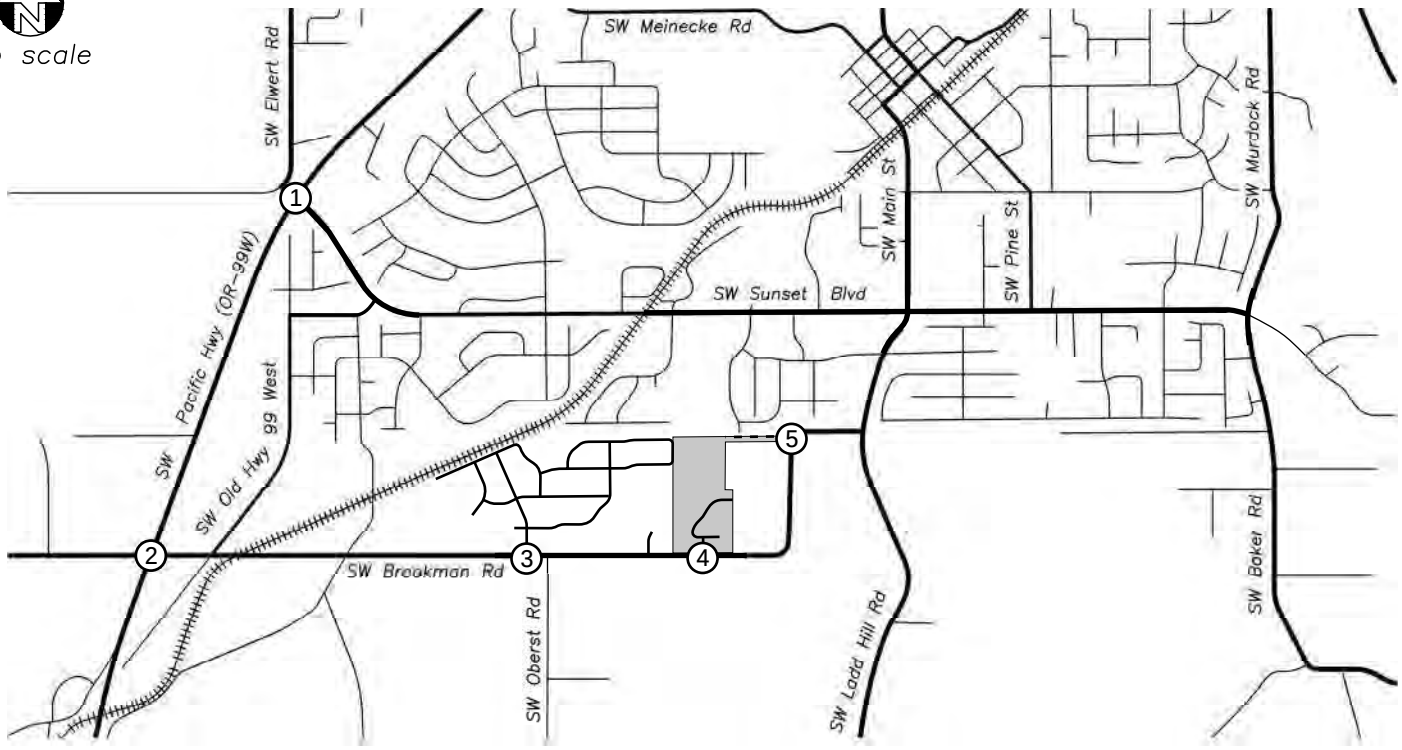
AM PEAK HOUR



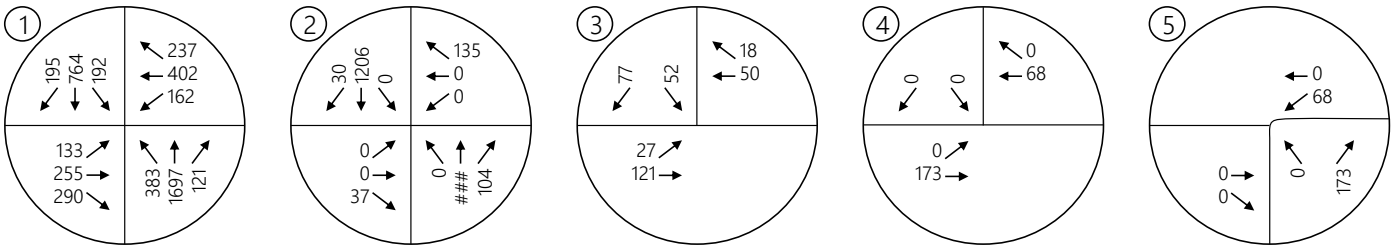
PM PEAK HOUR



no scale



AM PEAK HOUR



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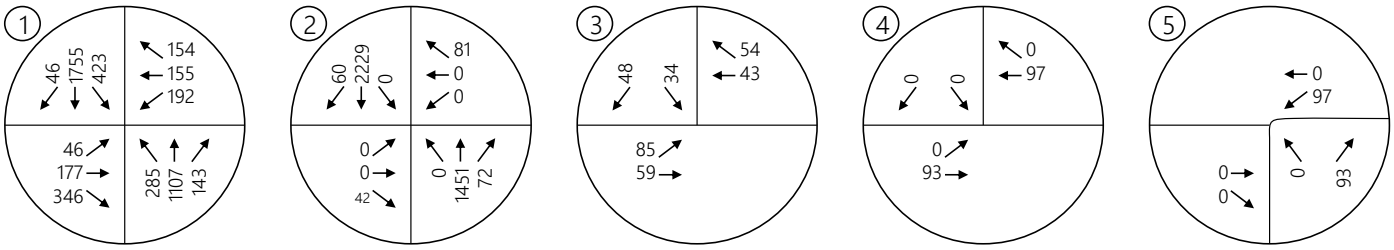

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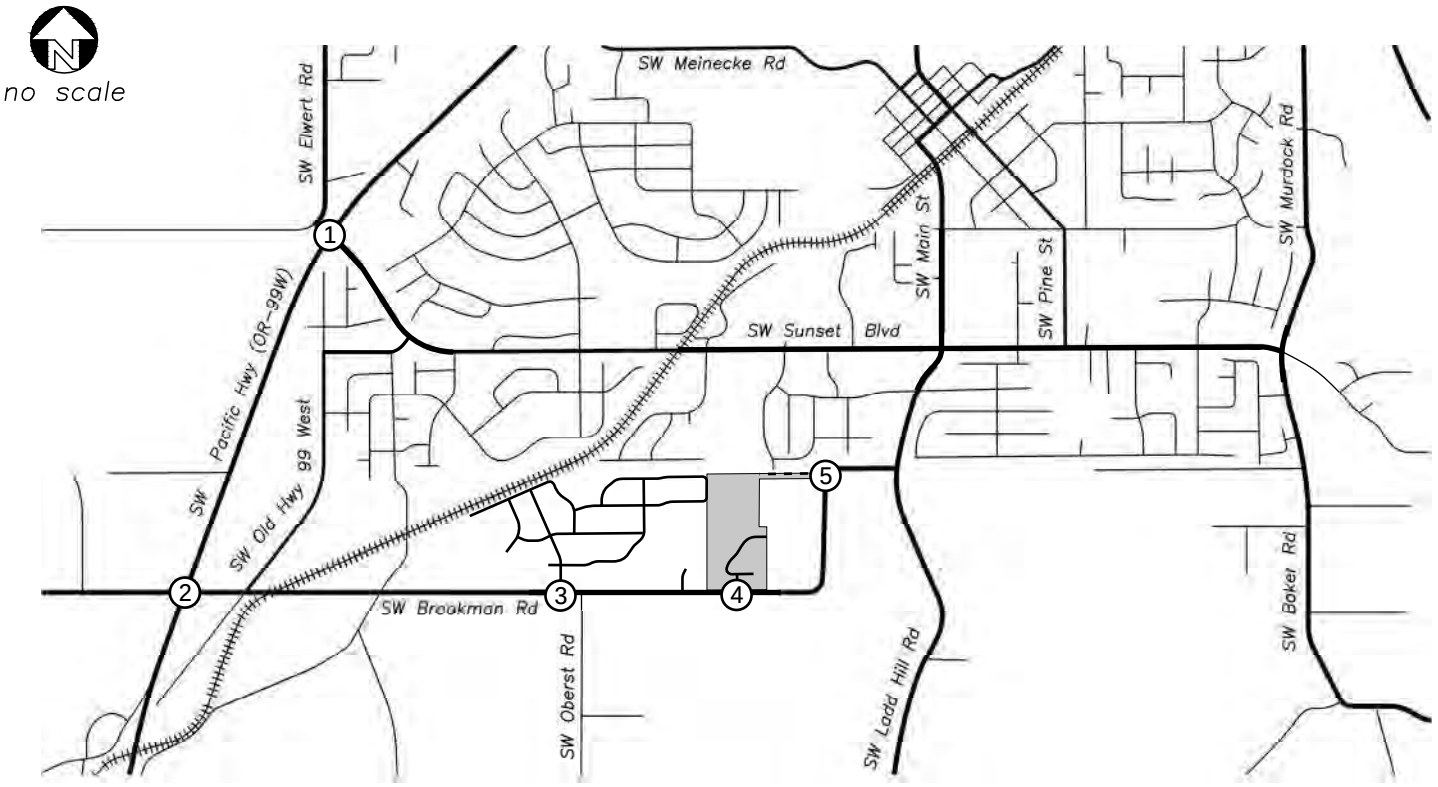
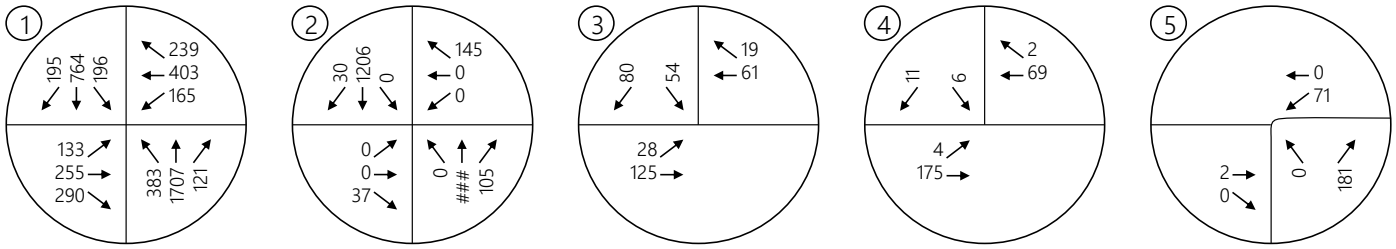
YEAR 2024 BACKGROUND CONDITIONS

TRAFFIC VOLUMES

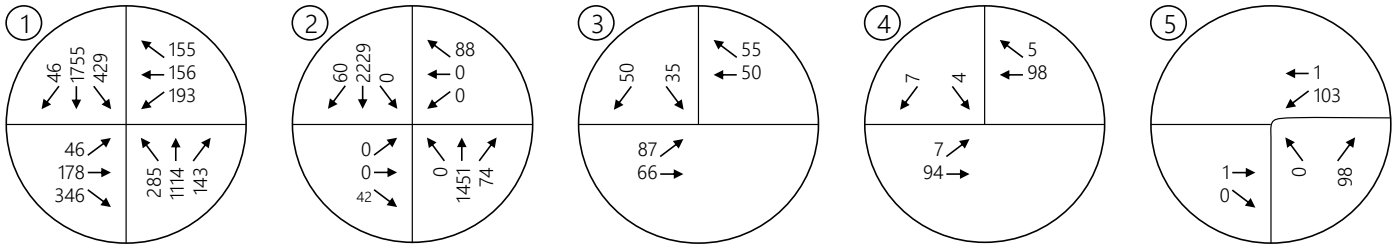
Figure 6
Cedar Creek Gardens
11/2/2021



AM PEAK HOUR



PM PEAK HOUR



Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2014 through December 2018) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- *PDO* – Property Damage Only;
- *Injury C* – Possible Injury;
- *Injury B* – Suspected Minor Injury;
- *Injury A* – Suspected Serious Injury; and
- *Fatality*

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents approximately 10 percent of the average daily traffic (ADT) at the intersection.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections. Detailed crash data is provided in the appendix to this report.

Table 4: Crash Type Summary

Intersection		Crash Type							Total Crashes
		Turn	Rear End	Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	SW Elwert Road/ SW Sunset Boulevard at Highway 99W	9	48	3	0	1	1	0	62
2	SW Brookman Rd at Highway 99W	8	2	17	1	1	0	0	29

Table 5: Crash Severity and Rate Summary

Intersection		Severity					Total Crashes	ADT	Crash Rate	ODOT 90th %
		PDO	C	B	A	Fatal				
1	SW Elwert Road/ SW Sunset Boulevard at Highway 99W	18	33	10	1	0	62	42,650	0.797	0.860
2	SW Brookman Rd at Highway 99W	14	6	8	1	0	29	37,000	0.429	0.860

Crash Severity

Two reported crashes were classified as *Injury A*:

- One rear-end collision occurred in 2019 between vehicles traveling northbound on Highway 99W at SW Elwert Road/SW Sunset Boulevard. The driver at fault was "following too closely."
- One angle collision occurred in 2015 on Highway 99W at SW Brookman Road. The crash involved a northbound motorcycle and a westbound passenger vehicle. The vehicle driver "did not yield right-of-way" to the motorcyclist who was seriously injured as a result of the collision.

Vulnerable Travelers

One turning collision reported in 2015 involved a southbound bicyclist traveling on the highway who was struck by a westbound passenger vehicles turning left from SW Sunset Boulevard onto the highway. The bicyclist was reported to have minor injuries (Injury B).

ODOT 90th Percentile Crash Rates

The study intersections adhere to the crash analysis methodologies within ODOT's Analysis Procedures Manual (APM). According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of their respective 90th percentile crash rates should be "flagged for further analysis". Crash rates in excess of 90th percentile crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

Intersection crash rates were calculated (Table 5); none have a rate above the respective ODOT 90th percentile crash rates.

ODOT Safety Priority Index System (SPIS)

The intersection of Highway 99W at SW Elwert Rd/SW Sunset Boulevard is reported in the worst 10 percent of intersections in ODOT's 2019 SPIS listing. No improvements are currently identified in the *2021-2024 Statewide Transportation Improvement Plan* that address this intersection.

Sight Distance Evaluation

A sight distance analysis was conducted at both the main site access and the shared driveway. To evaluate the sight distance available at these locations, intersection sight distance was measured in accordance with the current AASHTO manual[2]. According to AASHTO, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye-height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

AASHTO provides a recommendation for intersection sight distance (ISD) and a requirement for stopping sight distance (SSD). Intersection sight distance is an operational measure, intended to provide sufficient line of sight along the major street so that a driver could turn from the minor street with minimal impedance of traffic flow. Stopping sight distance is considered the minimum requirement to ensure safe operation of the roadway. Stopping sight distance allows an oncoming driver to see a hazard in the roadway, react, and come to a

[2] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.

complete stop if necessary to avoid a collision. As long as the available intersection sight distance is at least equal to the minimum required stopping sight distance for the design speed of the roadway, adequate sight distance is available for safe operation of the intersection.

A field investigation was conducted on Tuesday, November 2, 2021, to measure sight distance for this location. Figure 8 displays sight distance viewpoints from the future site accesses associated with the project. Due to existing vegetation, sight lines could not be viewed from 14.5 feet from the edge of the travel way.

Main Site Access

At the main site access on SW Brookman Road, the posted speed is 35 mph, but it transitions to 25 mph just east of the access. For the sight distance assessment, the speed of approaching vehicles was assumed to be 40 mph, which is 5 mph over the posted speed. At 40 mph, the recommended ISD is 445 feet and the required ISD is 305 feet.

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 445 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

Shared Driveway Access

At the shared driveway access on SW Brookman Road, the posted speed is 25 mph. For the sight distance assessment, the speed of approaching vehicles was assumed to be 25 mph due to the curvature of the roadway. At 25 mph, the recommended ISD is 280 feet and the required ISD is 155 feet.

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 280 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

A. Main Site Access Looking East

B. Main Site Access Looking West

C. Shared Driveway Looking East

D. Shared Driveway Looking South

Figure 8: Sight Line Photos at Future Site Accesses

Warrant Analysis

Left-turn lane warrants were examined for the site access intersection under year 2024 buildout conditions. A left-turn refuge is primarily a safety consideration for the major-street approach, removing left-turning vehicles from the through traffic stream.

Warrants for an eastbound left-turn lane at the site access intersection were based on the methodology outlined in the National Cooperative Highway Research Program (NCHRP) Report Number 457[3]. This methodology evaluates the need for a left-turn lane based on the number of left-turning vehicles, the number of travel lanes, the number of advancing and opposing vehicles, and the roadway travel speed.

Left-turn lane warrants are not projected to be met upon completion and occupancy of the proposed development. The detailed warrant analysis is included in the appendix.

[3] Bonneson, James A. and Michael D. Fontaine, *NCHRP Report 457: An Engineering Study Guide for Evaluating Intersection Improvements*, Transportation Research Board, 2001.

Operational Analysis

A capacity and delay analysis was conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual*[4] (HCM). Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates little, or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

The operating standards adopted by Washington County, ODOT, and the City of Sherwood are summarized below.

Washington County

SW Brookman Road is under the jurisdiction of Washington County. The County has defined operating standards for signalized and stop controlled intersections as follows:

- For signalized intersections, the maximum intersection v/c ratio shall be no greater than 0.99.
- For unsignalized intersections, no movement shall experience a v/c ratio greater than 0.99.

ODOT

ODOT operates and maintains Highway 99W. ODOT's operating mobility target for intersections along Highway 99W in the study area is an intersection v/c ratio no greater than 0.99 during the 1st and 2nd peak hours per Table 7 of the *Oregon Highway Plan*[5].

City of Sherwood

According to the City of Sherwood's Transportation System Plan (TSP), both signalized and unsignalized intersections under City jurisdiction must operate at LOS D or better with a v/c ratio of 0.85 or less; however, two-way stop-controlled intersections are required to operate at LOS E or better with a v/c ratio of 0.90 or less[6].

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6 for the morning and evening peak hours. Detailed calculations are included in the appendix.

[4] Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.
[5] Oregon Department of Transportation, *Oregon Highway Plan*. 1999
[6] City of Sherwood, *Sherwood Transportation System Plan*. Adopted June 17th, 2014.

Table 6: Capacity Analysis Summary

Intersection & Condition	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SW Elwert Road/SW Sunset Boulevard at Highway 99W						
2021 Existing Conditions	C	25	0.78	C	34	0.86
2024 Background Conditions	D	40	0.94	D	46	0.95
2024 Buildout Conditions	D	41	0.95	D	46	0.95
2. SW Brookman Road at Highway 99W						
2021 Existing Conditions	F	60	0.37	F	212	0.83
2024 Background Conditions	F	63	0.73	D	30	0.23
2024 Buildout Conditions	F	70	0.79	D	30	0.23
3. SW Brookman Road at Middlebrook Site Access						
2024 Background Conditions	B	11	0.24	B	11	0.17
2024 Buildout Conditions	B	11	0.25	B	11	0.18
4. SW Brookman Road at Main Sitrie Access						
2024 Buildout Conditions	A	10	0.03	A	10	0.02
5. SW Brookman Road at North Site Access						
2024 Buildout Conditions	B	11	0.01	B	10	0.01

BOLDED results indicate operation above acceptable jurisdictional standards.

As shown, all study intersections are projected to operate within agency standards under all analysis scenarios for all conditions. These results differ slightly from the conclusions in previous studies for the following reasons:

- At the intersection of SW Elwert Road/SW Sunset Boulevard at Highway 99W, the analysis outputs indicate that the eastbound shared through-right lane acts as a de facto right-turn lane and recommends recoding the lane to reflect the condition. When the approach is recoded to show a single through lane and a right-turn lane, operations improve measurably because the right-turn factor is only applied to one lane rather than two lanes.
- According to the APM software settings for signalized intersection analysis, "ODOT default for lost time is 4.0 seconds." Therefore, all lost times were adjusted appropriately following the procedures in the APM.

Based on the above analysis and findings, all study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.

As shown in Figure 7, the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both the morning and evening peak hours. Restriping the eastbound approach to provide a through and a right-turn lane could improve flow at the intersection because it would eliminate

occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping.

Proportionate Share Mitigation Assessment

Consistent with *The Reserve TIA*, proportionate share fees were calculated at intersections determined as failing, using methodologies similar to those presented in Table 6 of the referenced TIA. Table 7 provides the methodology used to calculate proportionate share fees based on the Cedar Creek Gardens trip assignment.

Table 7: Proportionate Share Methodolgy Summary

Intersection	A. SW Sunset Boulevard at SW Woodehaven Drive	B. SW Sunset Boulevard at SW Timbrel Lane	C. SW Sunset Boulevard at SW Main Street/SW Ladd Hill Road	D. SW Sunset`` Boulevard at SW Murdock Road/SW Baker Road
Mitigation Project Summary	Construct Traffic Signal	Construct Mini Roundabout	Construct Traffic Signal	Construct NB LTL & SB RTL
City TSP Project ID	NA	D28	D26	D33
Peak Hour	Weekday AM	Weekday AM	Weekday PM	Weekday PM
Scenario Triggering Mitigation	No Build (2024)	No Build (2024)	No Build (2024)	No Build (2024)
Existing Total Entering Volume, TEV (X)	1,012	894	1,208	1,208
2024 No Build (Background with RIRO, Y)	1,541	1,318	1,487	1,371
2024 Project Trips (PT)	10	10	10	6
Background Growth (Z=Y-X)	529	424	279	163
Proportional Share (%, PT/(PT+Z))	1.86%	2.30%	3.46%	3.55%
Mitigation Cost Estimate ($)	$1,050,000	$630,000	$250,000	$750,000
Cost Estimate Reference	DKS (Ref 10)	DKS (Ref 10)	TSP (Ref 5)	TSP (Ref 5)
Proportional Share Cost	$19,480.52	$14,516.13	$8,650.52	$26,627.22
Total	$69,274.39			

Based on the proportionate share fee calculations, a total proportionate share fee to mitigate site trip impacts to the above intersections is $69,274.39.

Conclusions

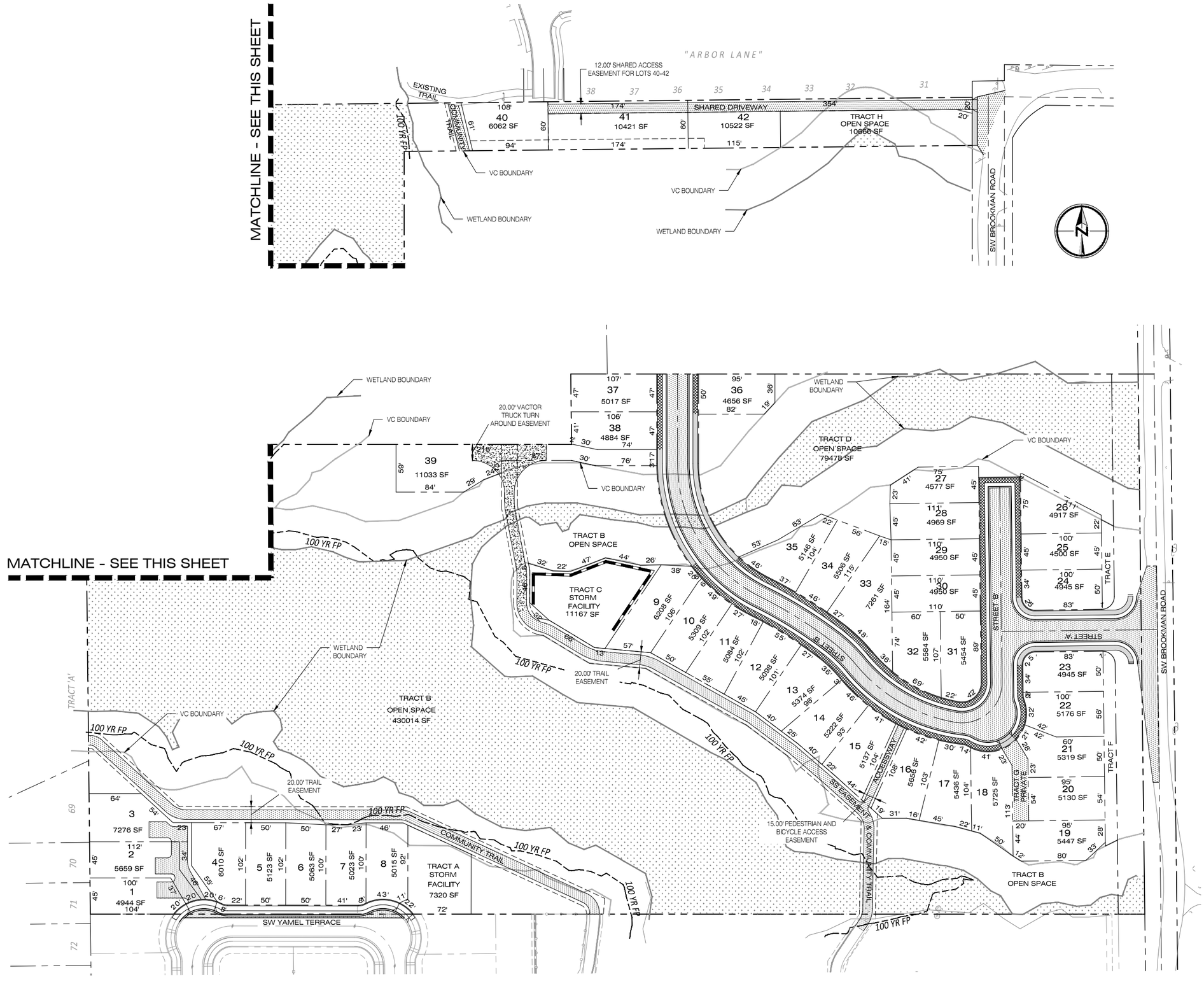
Key findings of this study include:

- No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
- A review of existing sight lines and elevation profiles from Google Earth show that adequate sight distance can be available if the roadside vegetation is cleared with the development. Both the intersection sight distance and stopping sight distance can be met at the main site access and the shared driveway.
- Left-turn lane warrants are not projected to be met at the site access intersection along SW Brookman Road upon completion and occupancy of the proposed development. Accordingly, installation of a left-turn lane at the site access intersection is not necessary or recommended.
- All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.
- Because the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both peak hours under all scenarios, agencies may wish to consider restriping the eastbound approach to provide a through and a right-turn lane. This change would eliminate occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping. The change is not necessary to accommodate the proposed development.
- *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019, identified four intersections as currently exceeding acceptable jurisdictional standards. Based on the projected site trip impacts to these intersections, a total proportionate share fee to mitigate impacts of $69,274.39 was calculated.

Appendix

- Site Plan
- Trip Generation
- Traffic Counts
- Reference Study Volumes
- In Process Trips
- Crash Data
- Sight Lines and Elevation Profiles
- Warrant Calculations
- Level of Service Definitions
- Operational Outputs

Exhibit A24



PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
PORTLAND, OREGON | HONOLULU, HAWAII
PH: 503.643.8286 PH: 808.753.2276
WWW.PD-GRP.COM

PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P3.0plat.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.0

B:\Projects\285-021-19\Planning\28521_P3.0plat.dwg 10/20/2021 12:27:11 PM

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 42

AM PEAK HOUR

Trip Equation: Ln(T)=0.91Ln(X)+0.120

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	9	25	34

PM PEAK HOUR

Trip Equation: Ln(T)=0.94Ln(X)+0.27

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	28	16	44

WEEKDAY

Trip Equation: Ln(T)=0.92Ln(X)+2.68

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	227	227	454

SATURDAY

Trip Equation: Ln(T)=0.97Ln(X)+2.4

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	207	207	414

Source: Trip Generation Manual, 11th Edition

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 2

AM PEAK HOUR

Trip Equation: Ln(T)=0.91Ln(X)+0.120

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	1	1	2

PM PEAK HOUR

Trip Equation: Ln(T)=0.94Ln(X)+0.27

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	2	1	3

WEEKDAY

Trip Equation: Ln(T)=0.92Ln(X)+2.68

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	14	14	28

SATURDAY

Trip Equation: Ln(T)=0.97Ln(X)+2.4

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	11	11	22

Source: Trip Generation Manual, 11th Edition

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

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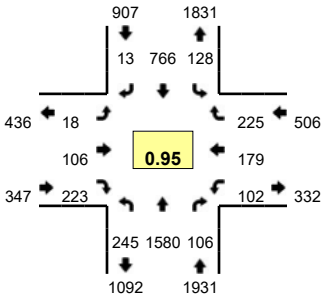
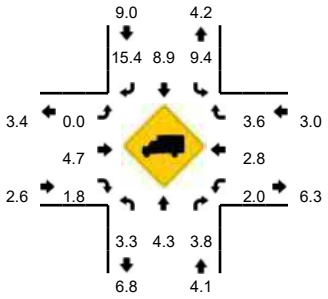
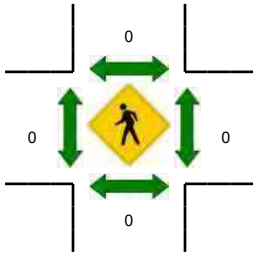
CITY/STATE: Sherwood, OR

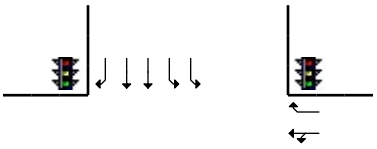
QC JOB #: 14401717
DATE: Thu, May 11 2017

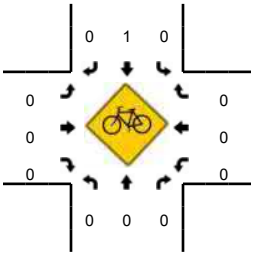


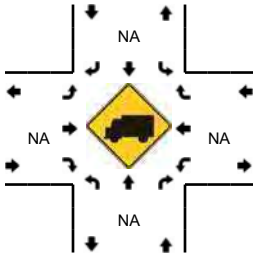
Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

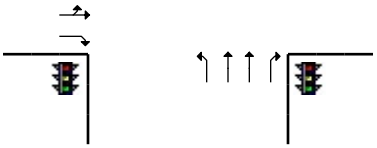


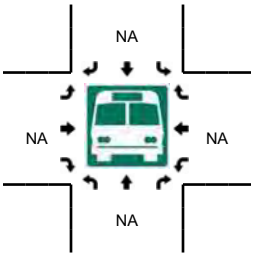












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Elwert Rd/SW Sunset Blvd (Eastbound)				SW Elwert Rd/SW Sunset Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	22	126	6	0	2	43	0	1	0	5	15	0	11	13	12	0	256	
7:05 AM	10	136	9	0	3	71	2	0	3	5	19	0	8	8	17	0	291	
7:10 AM	20	118	8	0	8	54	1	1	1	7	25	0	14	19	12	0	288	
7:15 AM	34	127	9	0	6	44	1	1	1	9	17	0	9	15	19	0	292	
7:20 AM	23	140	8	0	5	60	0	0	3	5	16	0	16	8	16	0	300	
7:25 AM	22	154	14	0	7	76	1	0	0	5	14	0	3	15	16	0	327	
7:30 AM	19	119	7	0	11	50	1	1	4	14	20	0	4	21	17	0	288	
7:35 AM	22	123	5	0	12	52	1	1	1	9	14	0	13	25	16	0	294	
7:40 AM	20	139	9	0	13	64	0	1	1	9	14	0	7	19	19	0	315	
7:45 AM	23	122	7	0	20	69	2	2	2	9	21	0	7	15	23	0	322	
7:50 AM	14	121	8	0	11	100	2	0	0	13	24	0	8	14	23	0	338	
7:55 AM	26	115	10	0	17	59	1	1	2	10	20	0	7	11	29	0	308	3619
8:00 AM	11	166	12	1	7	67	1	0	0	11	19	0	6	9	18	0	328	3691
8:05 AM	8	79	9	0	8	63	0	1	1	5	26	0	10	5	15	0	230	3630
8:10 AM	16	81	4	0	6	48	0	3	2	2	11	0	7	14	12	0	206	3548
8:15 AM	12	133	6	0	6	83	0	1	1	4	12	0	5	7	12	0	282	3538
8:20 AM	23	98	8	0	6	40	0	4	0	6	16	0	7	8	7	0	223	3461
8:25 AM	11	110	9	0	6	55	0	2	2	2	19	0	7	8	9	0	240	3374
8:30 AM	16	76	5	0	13	51	0	3	0	3	10	0	7	6	14	0	204	3290
8:35 AM	17	128	7	0	7	66	2	1	1	8	13	0	5	9	11	0	275	3271
8:40 AM	9	112	11	0	9	62	1	1	1	3	10	0	3	4	3	0	229	3185
8:45 AM	8	93	8	0	7	60	0	0	1	4	10	0	11	8	17	0	227	3090
8:50 AM	9	96	11	0	3	59	0	1	1	7	23	0	7	6	12	0	235	2987
8:55 AM	9	86	6	0	8	74	1	3	1	8	8	0	5	3	11	0	223	2902

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	228	1528	96	0	176	932	16	12	12	124	236	0	88	192	260	0	3900
Heavy Trucks	12	68	4		12	60	4		0	4	0		0	4	16		184
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

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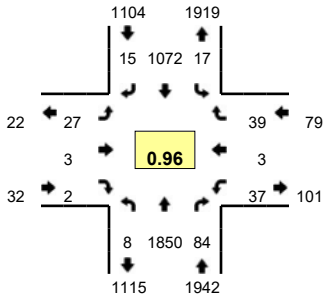
CITY/STATE: Sherwood, OR

QC JOB #: 14401706
DATE: Thu, May 11 2017



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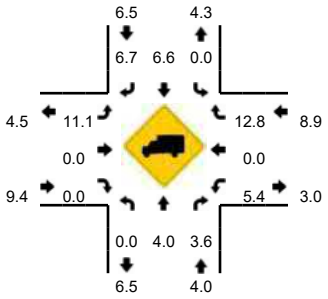
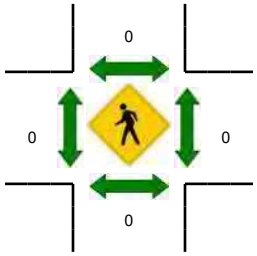
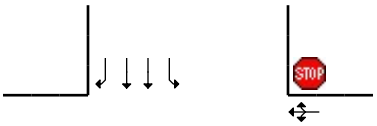
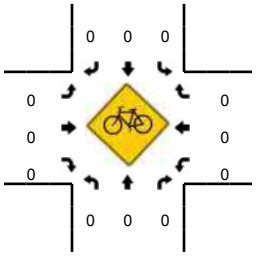
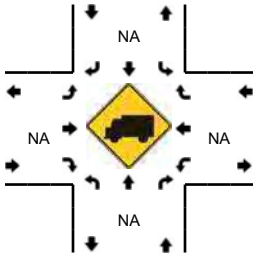
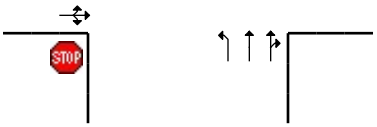


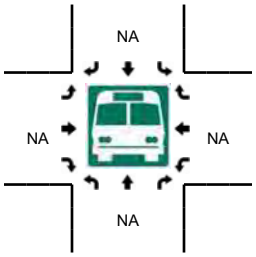












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Chapman Rd (Eastbound)				SW Chapman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	133	2	0	0	74	0	0	1	0	0	0	4	0	3	0	217	
7:05 AM	0	169	5	1	0	81	4	0	0	0	0	0	2	0	0	0	262	
7:10 AM	0	159	6	0	0	99	1	1	1	0	0	0	1	0	1	0	269	
7:15 AM	1	165	11	0	1	75	0	0	0	1	0	0	2	0	2	0	258	
7:20 AM	0	174	7	0	0	100	0	1	1	1	0	0	3	0	1	0	288	
7:25 AM	0	141	8	1	1	78	1	0	3	0	0	0	4	0	2	0	239	
7:30 AM	0	177	8	0	1	84	0	0	4	0	1	0	0	1	4	0	280	
7:35 AM	0	177	8	0	0	85	1	0	0	0	0	0	4	0	3	0	278	
7:40 AM	1	147	14	1	1	85	1	0	4	0	0	0	3	1	5	0	263	
7:45 AM	1	142	9	0	4	99	2	0	3	0	0	0	2	0	4	0	266	
7:50 AM	0	147	6	0	1	125	1	1	2	0	0	0	4	1	3	0	291	
7:55 AM	1	133	1	0	3	82	2	0	1	1	1	0	8	0	6	0	239	3150
8:00 AM	0	119	1	1	2	79	2	0	8	0	0	0	4	0	8	0	224	3157
8:05 AM	0	98	4	0	2	85	4	0	5	0	0	0	2	1	1	0	202	3097
8:10 AM	0	127	2	0	1	82	1	0	0	1	0	0	3	0	1	0	218	3046
8:15 AM	0	130	3	0	2	72	2	0	3	0	1	0	2	0	2	0	217	3005
8:20 AM	1	135	6	0	1	89	1	1	0	1	0	0	3	0	2	0	240	2957
8:25 AM	0	115	5	0	3	63	0	0	0	0	0	0	0	0	1	0	187	2905
8:30 AM	0	127	3	0	1	71	0	0	1	0	0	0	3	1	3	0	210	2835
8:35 AM	0	118	3	0	1	83	2	0	2	0	0	0	0	1	1	0	211	2768
8:40 AM	1	143	0	1	1	68	2	1	1	0	0	0	3	0	0	0	221	2726
8:45 AM	0	108	1	0	1	87	4	1	0	1	0	0	3	0	2	0	208	2668
8:50 AM	1	127	3	0	0	88	1	0	0	1	1	0	1	0	1	0	224	2601
8:55 AM	0	93	4	0	1	89	3	0	2	1	1	0	3	1	1	0	199	2561

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	2004	120	4	8	1016	8	0	32	0	4	0	28	8	48	0	3284
Heavy Trucks	0	64	4		0	100	0		0	0	0		4	0	4		176
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

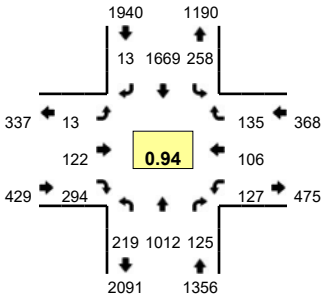
Type of peak hour being reported: Intersection Peak

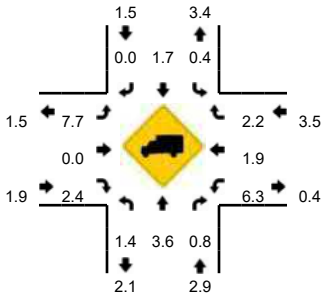
Method for determining peak hour: Total Entering Volume

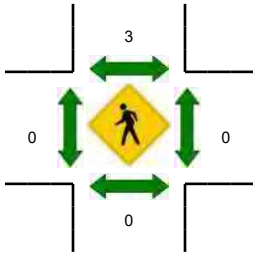
LOCATION: SW Pacific Hwy -- SW Elwert Rd/SW Sunset Blvd
CITY/STATE: Sherwood, OR

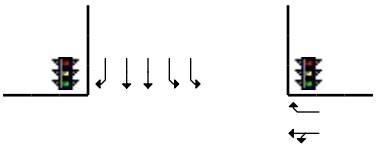
QC JOB #: 14401718
DATE: Thu, May 11 2017

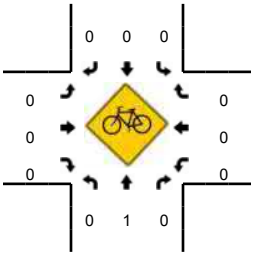
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

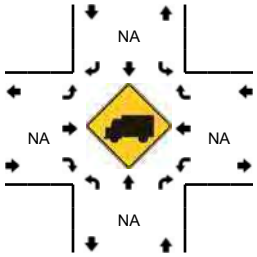


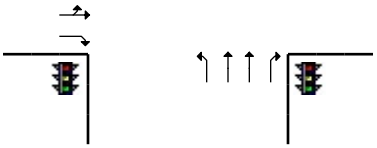


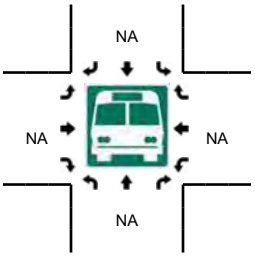












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Elwert Rd/SW Sunset Blvd (Eastbound)				SW Elwert Rd/SW Sunset Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	15	71	6	1	11	141	3	4	3	11	27	0	10	6	6	0	315	
4:05 PM	4	62	14	0	14	154	0	1	0	12	26	0	7	5	11	0	310	
4:10 PM	12	76	3	0	11	132	0	2	0	10	27	0	9	8	10	0	300	
4:15 PM	13	96	13	1	10	111	3	3	1	7	25	0	11	8	15	0	317	
4:20 PM	16	91	13	1	13	149	0	5	0	12	18	0	13	7	11	0	349	
4:25 PM	13	82	5	0	12	140	2	3	1	9	21	0	12	10	16	0	326	
4:30 PM	22	73	10	0	12	110	3	2	0	11	28	0	6	7	11	0	295	
4:35 PM	16	82	8	0	19	121	2	6	0	11	26	0	10	8	11	0	320	
4:40 PM	24	100	17	1	13	129	1	2	0	7	29	0	12	8	9	0	352	
4:45 PM	23	79	9	0	19	136	0	3	1	7	22	0	11	19	15	0	344	
4:50 PM	22	87	11	0	22	124	1	3	2	12	27	0	11	10	12	0	344	
4:55 PM	14	78	16	0	25	136	1	1	2	6	28	0	12	8	18	0	345	3917
5:00 PM	19	77	8	0	10	117	0	5	2	11	29	0	9	11	10	0	308	3910
5:05 PM	13	63	8	0	16	153	2	2	0	12	22	0	17	6	16	0	330	3930
5:10 PM	16	80	9	0	22	158	0	0	1	13	23	0	13	4	10	0	349	3979
5:15 PM	15	95	17	0	14	157	2	2	5	7	22	0	11	10	8	0	365	4027
5:20 PM	14	108	4	0	25	154	1	4	0	12	22	0	12	9	12	0	377	4055
5:25 PM	22	75	7	0	16	142	1	5	0	13	24	0	6	8	7	0	326	4055
5:30 PM	21	93	11	0	25	110	2	1	0	9	27	0	7	6	11	0	323	4083
5:35 PM	15	77	8	0	21	153	2	2	0	13	19	0	6	7	7	0	330	4093
5:40 PM	17	89	9	0	21	131	0	7	0	10	25	0	4	8	8	0	329	4070
5:45 PM	17	88	13	0	8	136	3	1	1	5	26	0	7	8	11	0	324	4050
5:50 PM	19	87	15	0	22	134	0	3	1	11	25	0	10	5	11	0	343	4049
5:55 PM	17	64	8	0	31	134	4	2	0	12	15	0	11	6	11	0	315	4019

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	180	1132	120	0	244	1876	12	24	24	128	268	0	144	92	120	0	4364
Heavy Trucks	8	40	4		0	20	0		4	0	8		8	0	0		92
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM

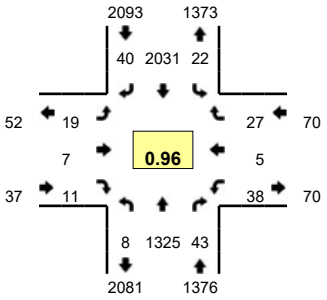
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

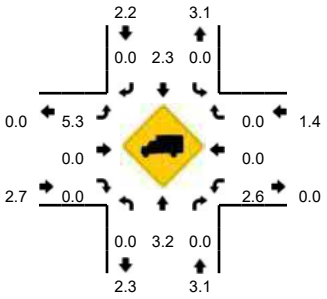
Method for determining peak hour: Total Entering Volume

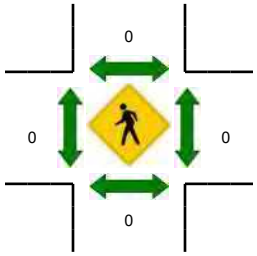
LOCATION: SW Pacific Hwy -- SW Chapman Rd
CITY/STATE: Sherwood, OR

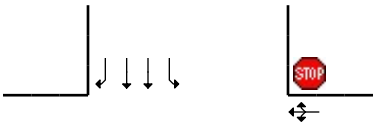
QC JOB #: 14401707
DATE: Thu, May 11 2017

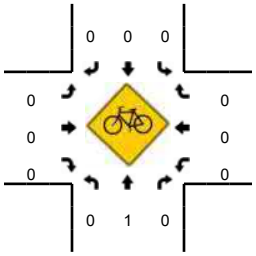


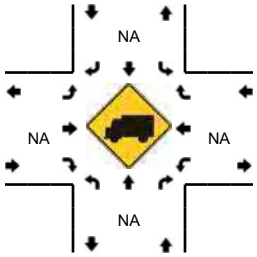
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

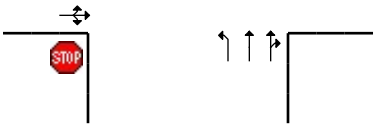


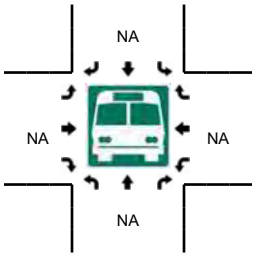












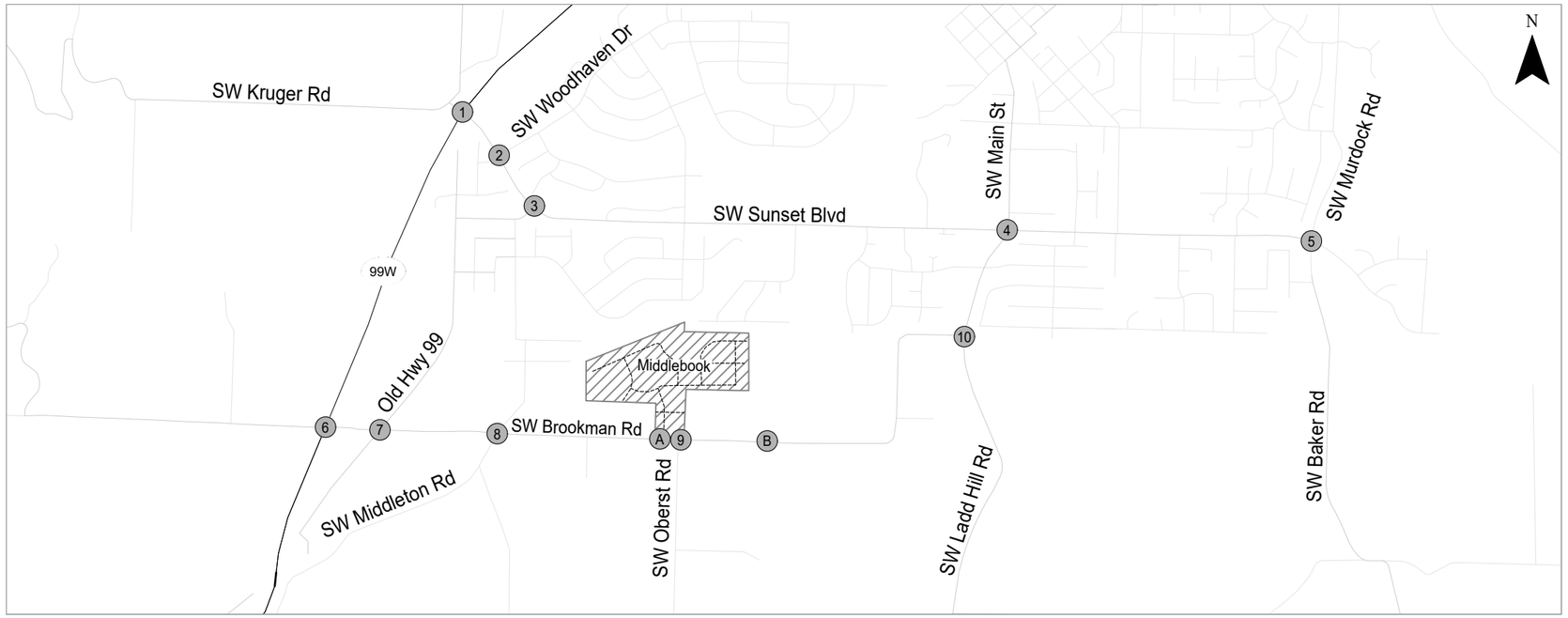
5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Chapman Rd (Eastbound)				SW Chapman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	89	1	0	1	184	2	0	1	1	0	0	2	0	0	0	281	
4:05 PM	0	72	6	1	0	166	3	0	0	0	1	0	5	0	0	0	254	
4:10 PM	1	103	2	1	1	160	1	0	1	0	1	0	3	0	1	0	275	
4:15 PM	0	126	4	0	1	163	4	0	4	0	0	0	4	0	2	0	308	
4:20 PM	0	124	1	0	1	153	1	0	1	0	0	0	4	0	0	0	285	
4:25 PM	1	92	5	0	1	172	4	0	1	0	0	0	4	0	2	0	282	
4:30 PM	1	102	2	0	3	149	0	0	0	0	0	0	4	0	2	0	263	
4:35 PM	2	114	0	0	1	153	3	0	2	2	0	0	1	0	4	0	282	
4:40 PM	0	117	2	0	3	149	4	0	5	1	3	0	6	0	4	0	294	
4:45 PM	0	108	2	0	0	176	3	0	3	1	1	0	3	0	5	0	302	
4:50 PM	0	117	5	0	2	177	4	0	0	1	1	0	4	1	1	0	313	
4:55 PM	2	121	3	0	1	173	5	0	0	0	1	0	1	0	3	0	310	3449
5:00 PM	0	102	6	0	4	159	1	1	0	0	2	0	3	0	1	0	279	3447
5:05 PM	0	91	2	0	2	183	3	0	1	0	1	0	0	1	0	0	284	3477
5:10 PM	0	110	6	0	4	187	2	1	4	0	0	0	5	0	1	0	320	3522
5:15 PM	2	119	3	0	1	189	5	0	0	1	1	0	2	1	1	0	325	3539
5:20 PM	1	107	1	1	0	161	3	0	2	0	0	0	6	0	5	0	287	3541
5:25 PM	0	114	6	0	2	177	5	0	1	0	1	0	4	0	0	0	310	3569
5:30 PM	0	105	7	0	0	147	2	0	1	1	0	0	3	2	2	0	270	3576
5:35 PM	0	100	0	0	1	164	2	1	1	0	1	0	4	1	2	0	277	3571
5:40 PM	0	132	4	0	0	156	2	0	1	0	1	0	0	0	1	0	297	3574
5:45 PM	0	114	4	0	0	149	1	0	4	0	0	0	5	0	2	0	279	3551
5:50 PM	0	93	3	0	3	158	1	0	0	4	0	0	5	1	1	0	269	3507
5:55 PM	0	82	3	0	2	151	0	0	1	2	0	0	5	0	1	0	247	3444

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	1344	40	4	20	2148	40	4	24	4	4	0	52	4	28	0	3728
Heavy Trucks	0	44	0		0	40	0		0	0	0		0	0	0		84
Pedestrians		0				0				0				0			0
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

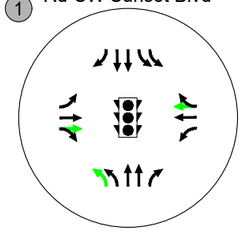
Comments:

Report generated on 5/19/2017 4:01 PM

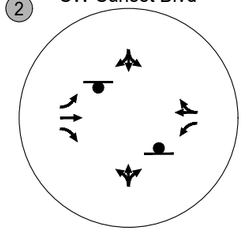
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212



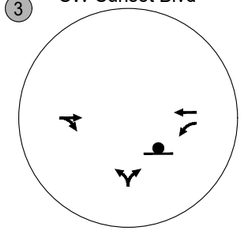
1 Hwy 99W/SW Elwert Rd-SW Sunset Blvd



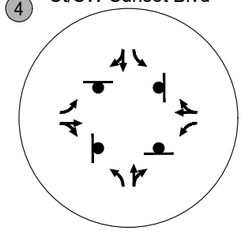
2 SW Woodhaven Dr/ SW Sunset Blvd



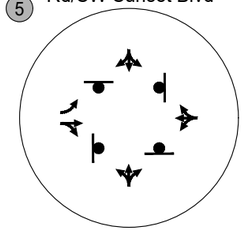
3 SW Timbrel Ln/ SW Sunset Blvd



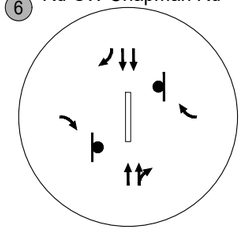
4 SW Ladd Hill Rd-SW Main St/SW Sunset Blvd



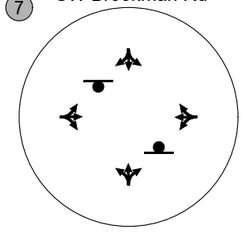
5 SW Baker Rd-SW Murdock Rd/SW Sunset Blvd



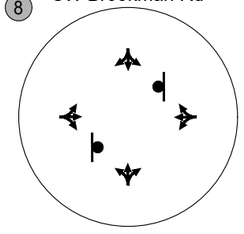
6 Hwy 99W/SW Brookman Rd-SW Chapman Rd



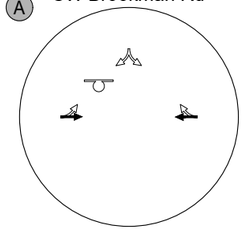
7 Old Hwy 99W/ SW Brookman Rd



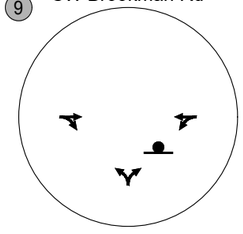
8 SW Middleton Rd/ SW Brookman Rd



A Middlebrook Access/ SW Brookman Rd



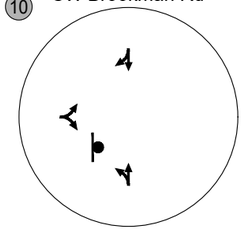
9 SW Oberst Rd/ SW Brookman Rd



B The Reserve Access/ SW Brookman Rd

Future Intersection

10 SW Ladd Hill Rd/ SW Brookman Rd



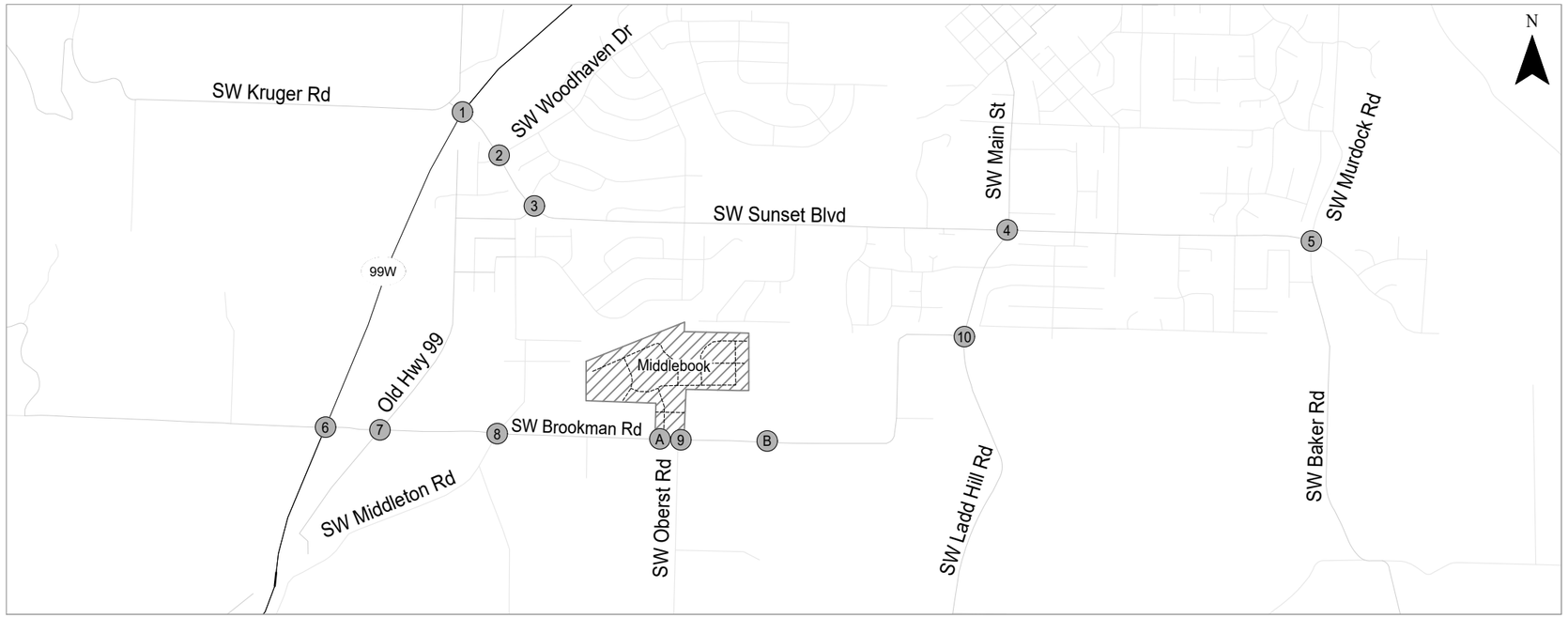
- STOP SIGN
- TRAFFIC SIGNAL
- RAISED MEDIAN
- EXISTING
- PLANNED IMPROVEMENT
- MOVEMENT/IMPROVEMENT ADDED WITH MIDDLEBROOK DEVELOPMENT

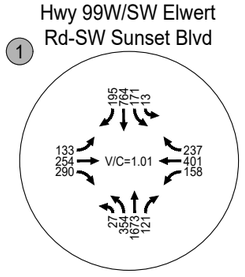
Year 2024 Background Assumed Lane Configurations and Traffic Control Devices
Sherwood, Oregon

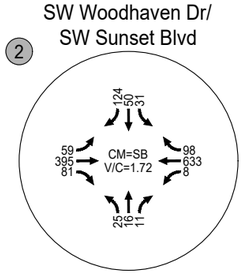
Figure 6

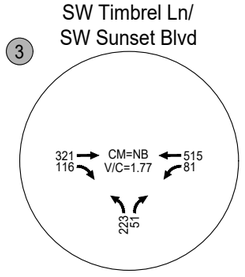
KITTELSON & ASSOCIATES

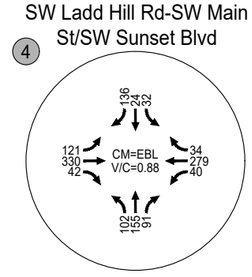
C:\KAI Applications\Autodesk\TEMP\AcPublish_15840\24316_The Reserve_Figures_NP_2019-09-09.dwg Sep 19, 2019 - 9:54am - nick Layout Tab: 6_BG_GEO

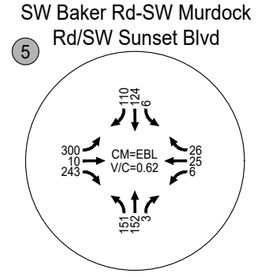


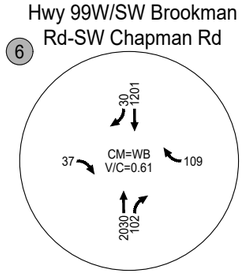


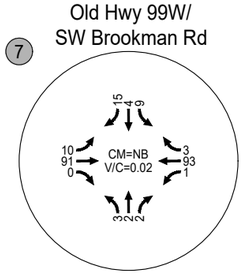


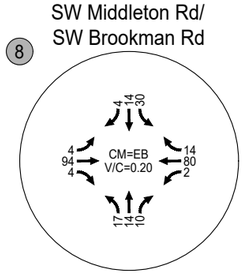


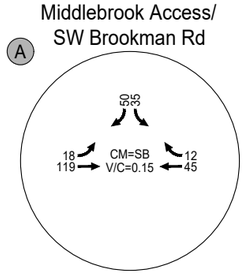


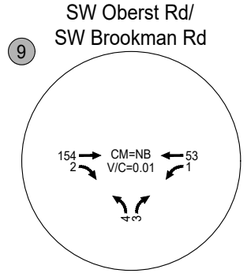


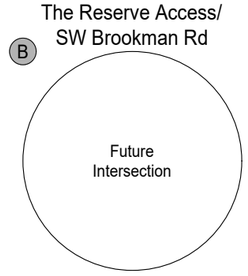


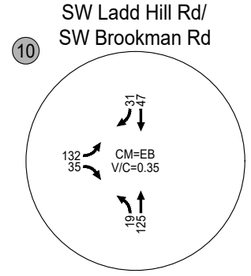












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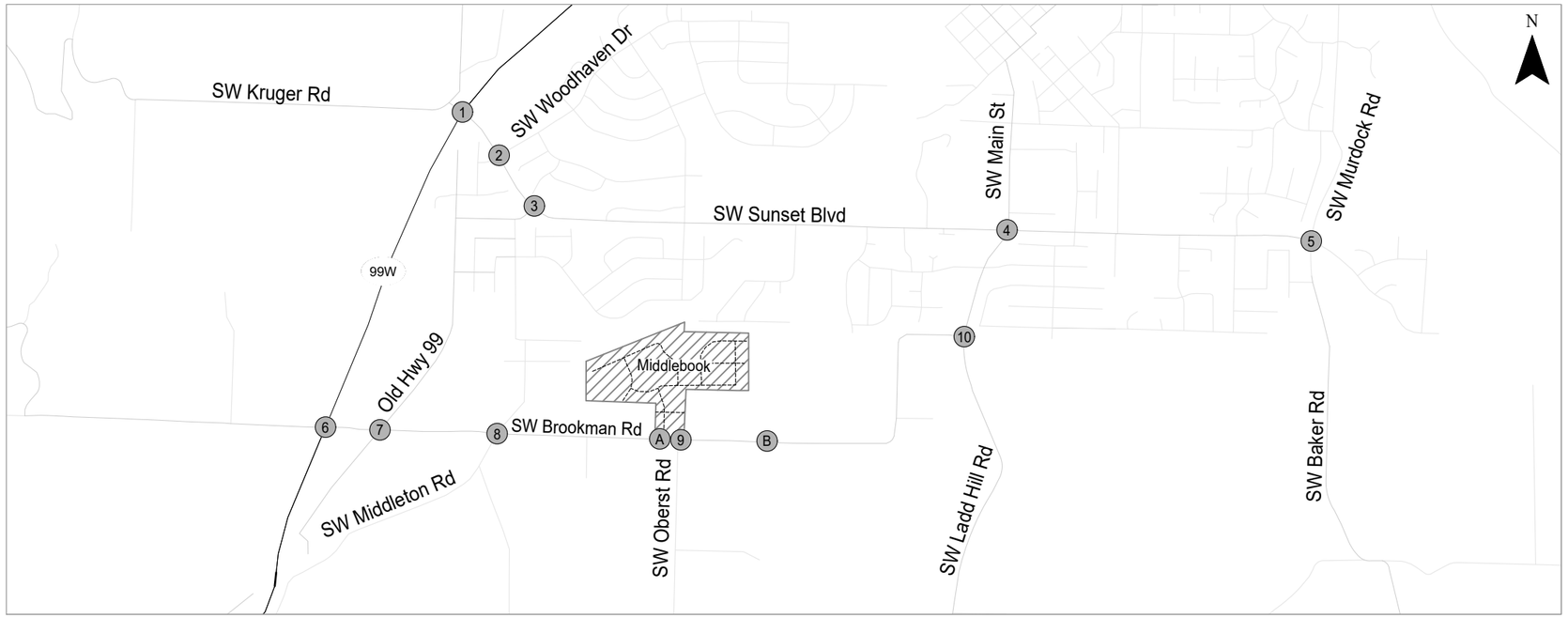
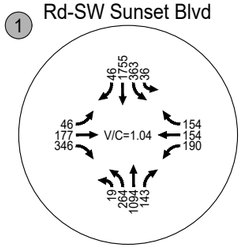
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
TWSC = TWO-WAY STOP CONTROL
AWSC= ALL-WAY STOP CONTROL

Year 2024 Background Intersection Operations Weekday AM Peak Hour Sherwood, Oregon

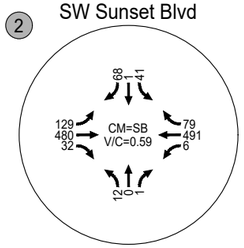
Figure 7



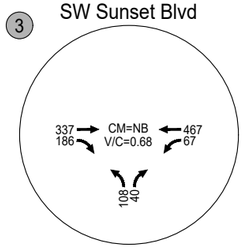
Hwy 99W/SW Elwert Rd-SW Sunset Blvd



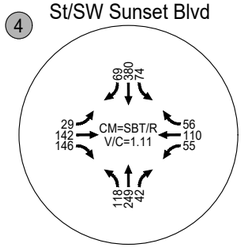
SW Woodhaven Dr/ SW Sunset Blvd



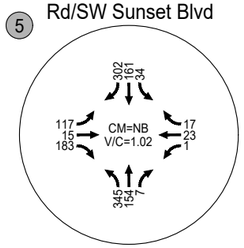
SW Timbrel Ln/ SW Sunset Blvd



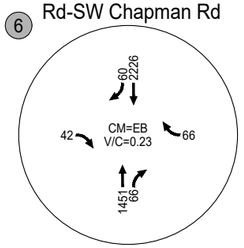
SW Ladd Hill Rd-SW Main St/SW Sunset Blvd



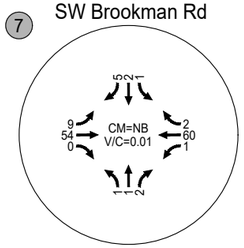
SW Baker Rd-SW Murdock Rd/SW Sunset Blvd



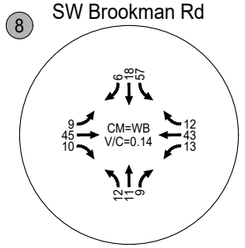
Hwy 99W/SW Brookman Rd-SW Chapman Rd



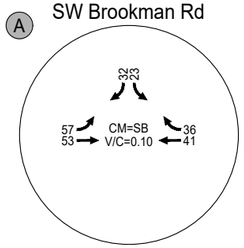
Old Hwy 99W/ SW Brookman Rd



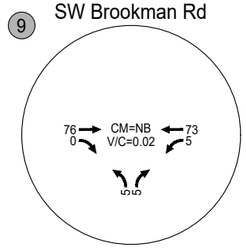
SW Middleton Rd/ SW Brookman Rd



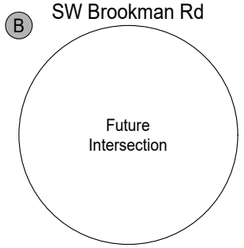
Middlebrook Access/ SW Brookman Rd



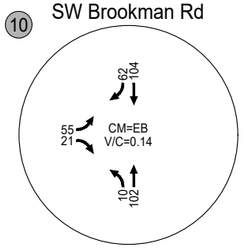
SW Oberst Rd/ SW Brookman Rd



The Reserve Access/ SW Brookman Rd



SW Ladd Hill Rd/ SW Brookman Rd



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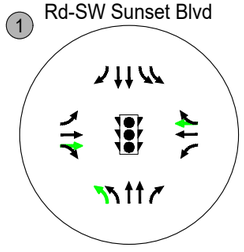
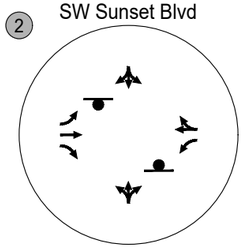
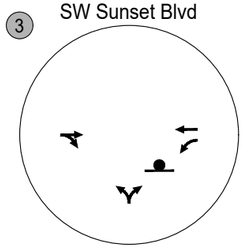
Year 2024 Background Intersection Operations Weekday PM Peak Hour Sherwood, Oregon

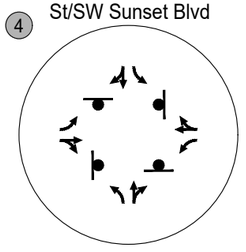
Figure 8

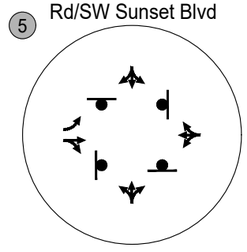
KITTELSON & ASSOCIATES

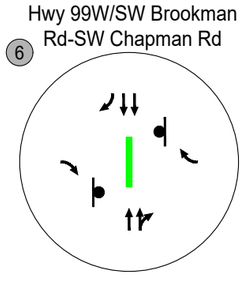


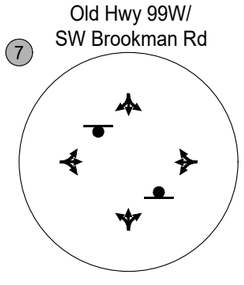


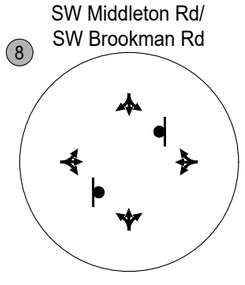


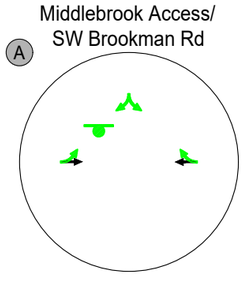


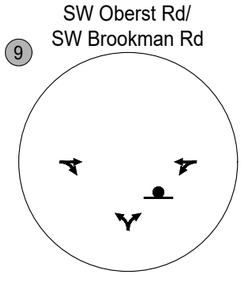


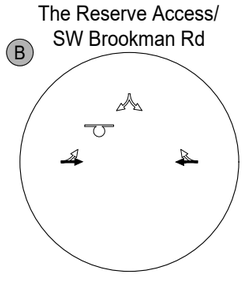


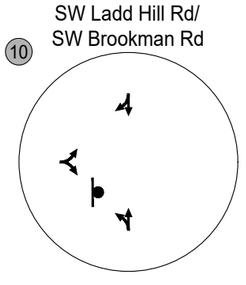








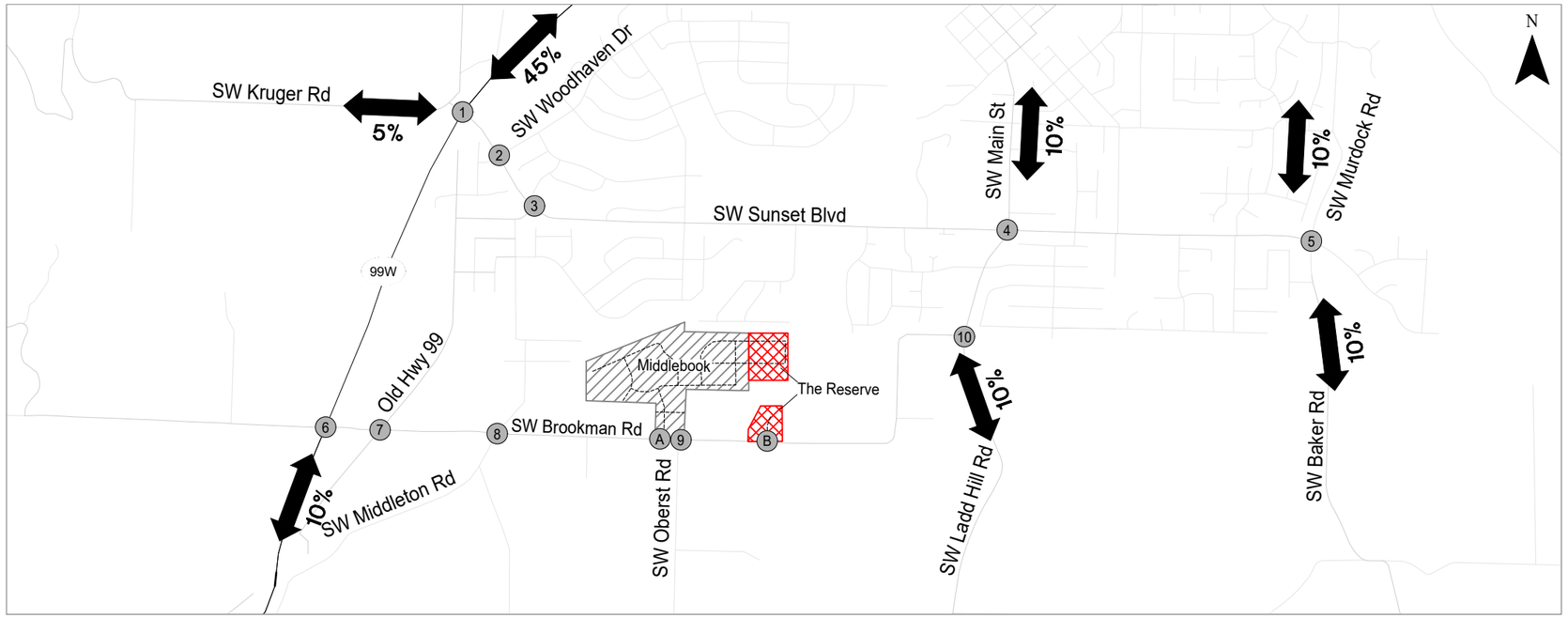


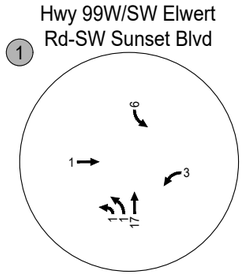


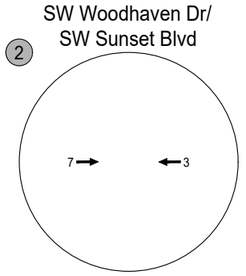
- STOP SIGN
- TRAFFIC SIGNAL
- RAISED MEDIAN
- EXISTING
- PLANNED IMPROVEMENT
- MOVEMENT ADDED WITH THE RESERVE DEVELOPMENT

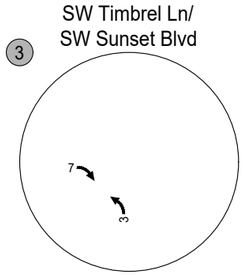
Year 2024 Background Assumed Lane Configurations and Traffic Control Devices
Sherwood, Oregon

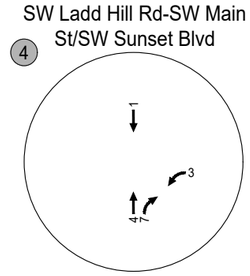
Figure 9

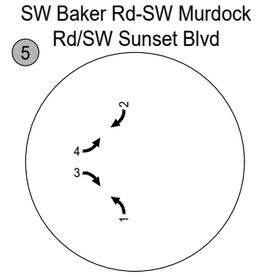


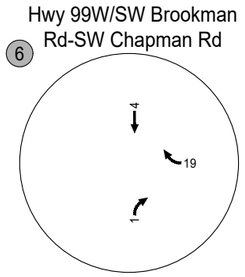


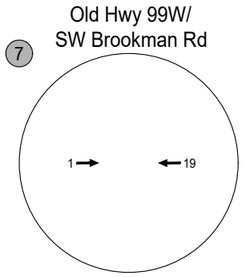


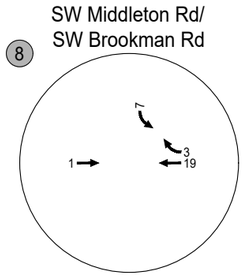


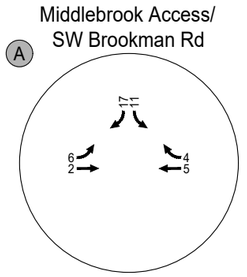


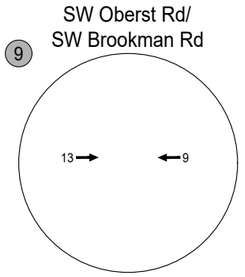


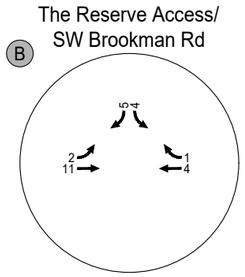


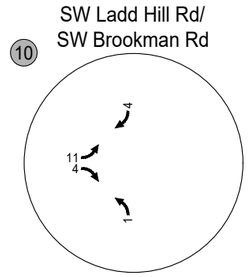






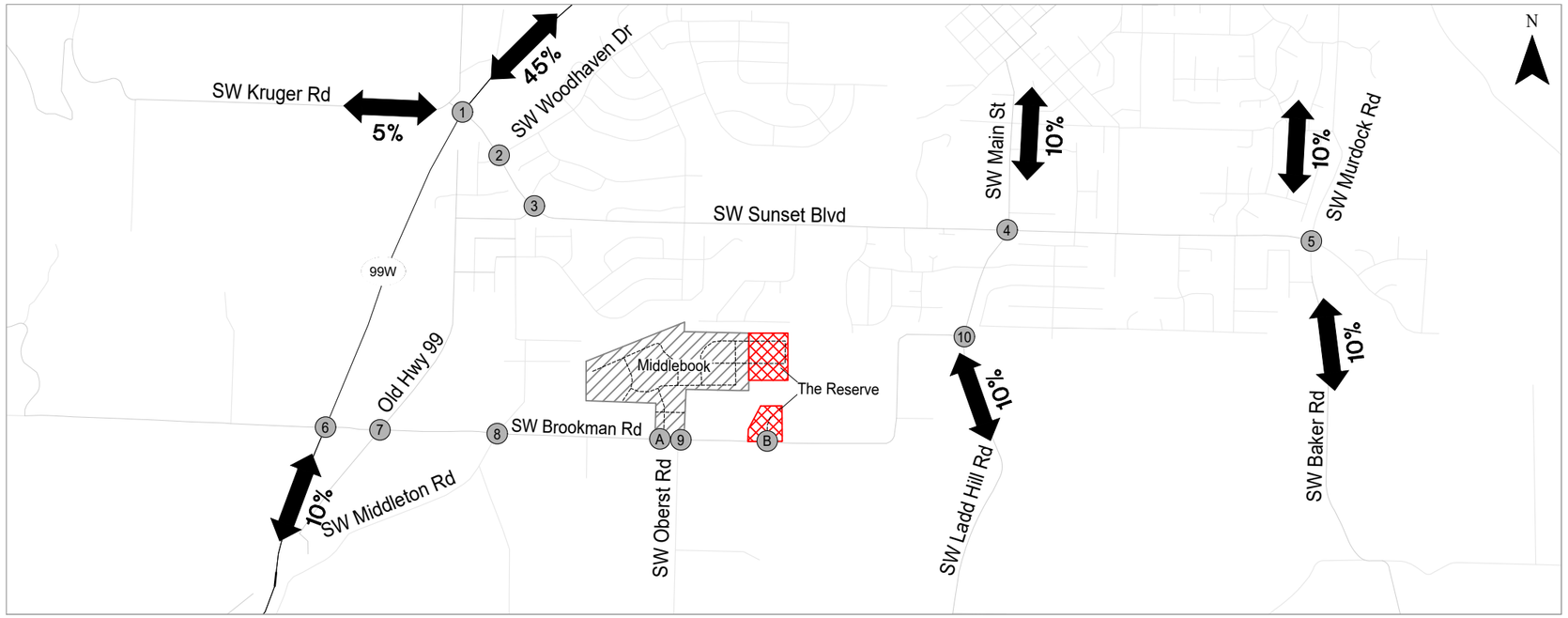


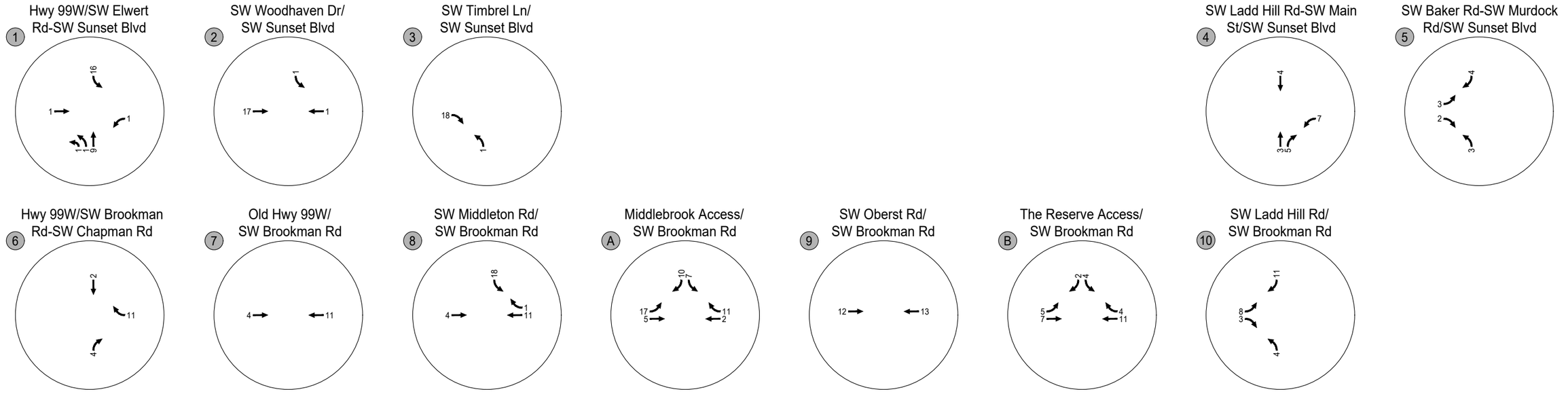




Assumed Trip Distribution and Assignment with RIRO at Highway 99W/SW Brookman Road-SW Chapman Road
Weekday AM Peak Hour
Sherwood, Oregon

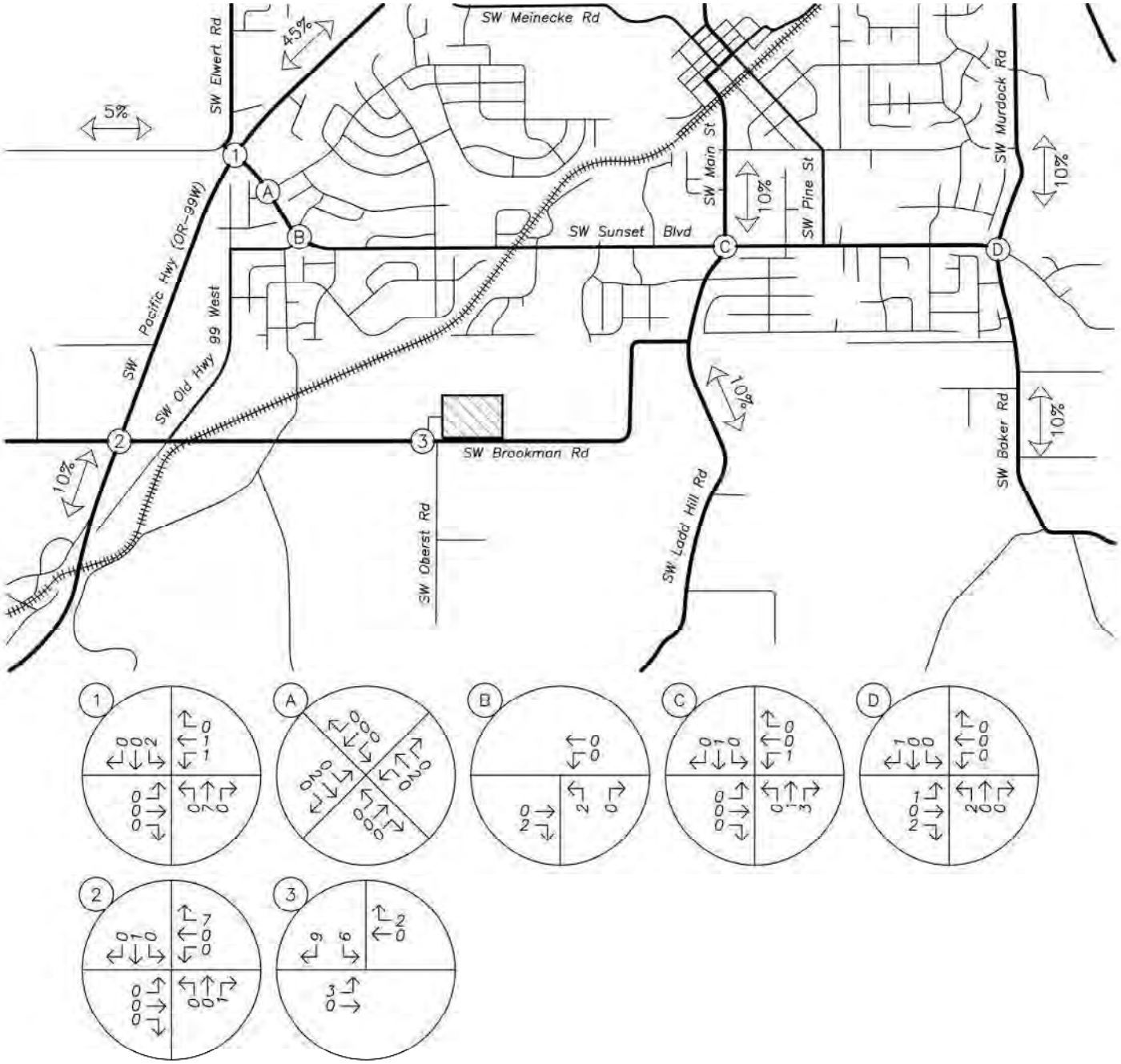
Figure
10





Assumed Trip Distribution and Assignment with RIRO at Highway 99W/SW Brookman Road-SW Chapman Road
Weekday PM Peak Hour
Sherwood, Oregon

Figure
11



no scale

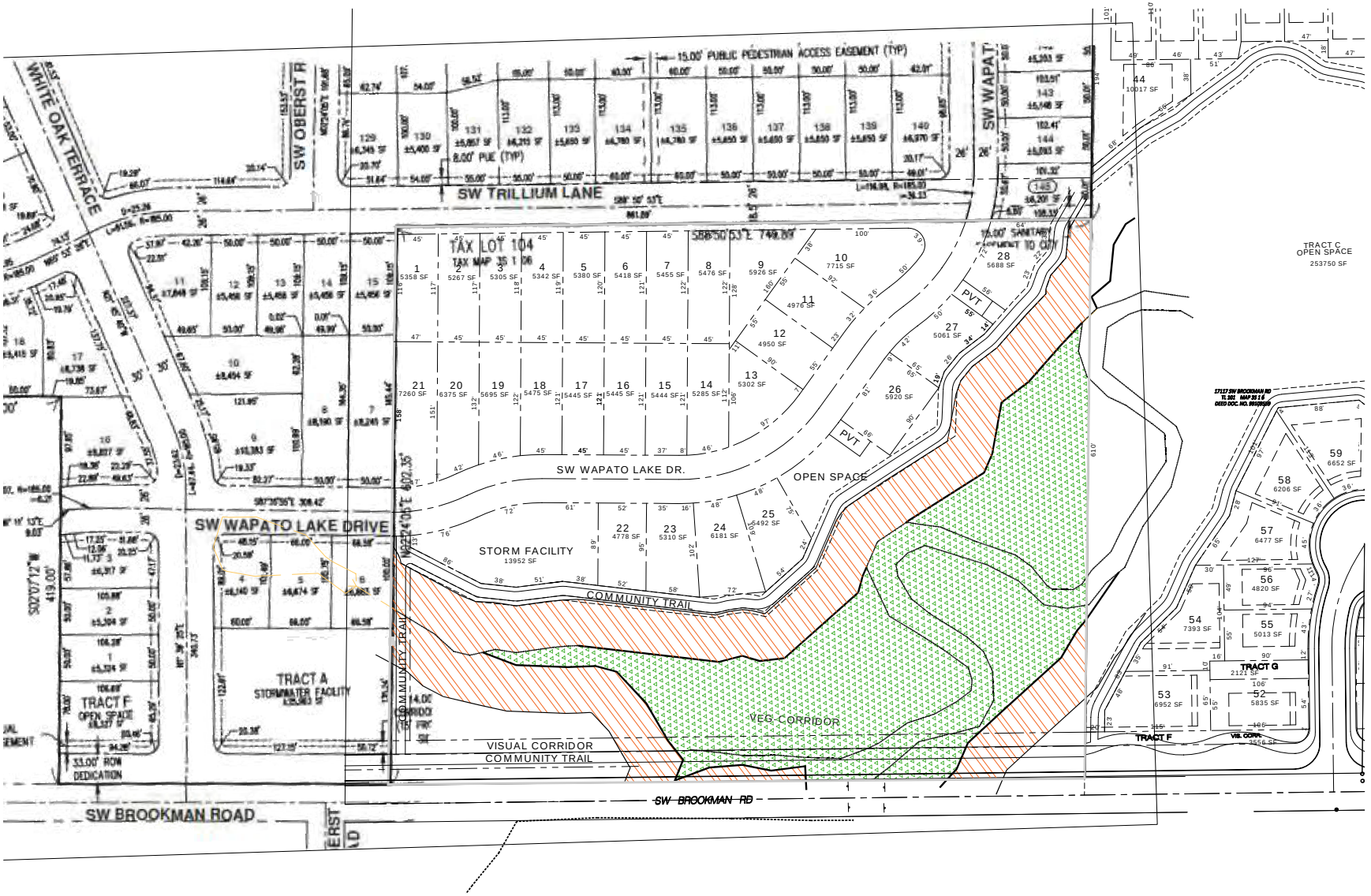
SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM Peak Hour

Figure 2
Cedar Creek Subdivision
3/31/2020

lancaster mobley

Exhibit A24



SCALE
50 0 25 50
1 INCH = 50 FEET

TVWD FILE #?????
WACO CASEFILE # ??-???-?

PIONEER DESIGN GROUP
BILLERICA, MASSACHUSETTS | LAKE OSWEGO, OREGON | HONOLULU, HAWAII
PORTLAND, OREGON | VANCOUVER, WASHINGTON
Ph: 503-643-3788
WWW.PD-GRP.COM

PRELIMINARY SITE PLAN

SCOTT PROPERTY
CITY OF SHERWOOD, OREGON

Designed by	MJS	Date	10/19
Drawn by	TCC	Date	10/19
Reviewed by	MJS	Date	10/19
Project No.	131-999	REF.	
Horiz. Scale:	1"=50'		
Vert. Scale:			

No.	Date	Revision	By

Project: SCOTT PROPERTY
No. 131-999
Type: PLANNING
Sheet: P0.0

B:\Projects\131-999\Brookman Road\Scott Property\P2.dwg 10/10/2019 3:58:51 PM

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 16.55 to 16.75 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

1 - 4 of 63 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J N V	S I H L	C N R K	O W	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02154	N	N	N	N	N	N	N	05/01/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY								WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	NONE	N	DRY	REAR		PRVTE	NE-SW									000		00
N								5P	PORTLAND UA	16.57		SW ELWERT RD	03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		043	000		07
N								45 21 16.15	-122 51 59.28			009100100S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW									011		00
																				PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		000	000		00
																											OR<25					
08211	N	N	N	N				11/30/2016	WASHINGTON	1 14			STRGHT		N	N	RAIN	S-1STOP	01	NONE 9	STRGHT											29
NONE								WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		N/A	NE-SW									000		00
N								3P	PORTLAND UA	16.60		SW SUNSET BLVD	03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 14.96	-122 52 .91			009100100S00		(04)													UNK					
																			02	NONE 9	STOP											
																				N/A	NE-SW									011		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
04096	N	N	N	N	N	N		08/12/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY								MO	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000		00
N								4P	PORTLAND UA	16.60		SW ELWERT RD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		043	000		07
N								45 21 14.96	-122 52 .91			009100100S00		(04)													OR>25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW									011		00
																				PSNGR CAR		01	DRVR	INJC	36	F	OR-Y		000	000		00
																											OR<25					
07960	N	N	N	N				12/22/2015	WASHINGTON	1 14			STRGHT		N	N	RAIN	S-1STOP	01	NONE 1	STRGHT											29
NO RPT								TU	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	NE-SW									000		00
N								4P	PORTLAND UA	16.61		SW ELWERT RD	04			N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	72	M	OR-Y		026	000		29
N								45 21 14.53	-122 52 1.4			009100100S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW									011		00
																				PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW									011		00
																				PSNGR CAR		02	PSNG	INJC	65	M			000	000		00
03457	N	N	N	N				06/21/2015	WASHINGTON	1 14			STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE								SU	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000		00
N								6P	PORTLAND UA	16.64		SW SUNSET BLVD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		042	000		29
N								45 21 13.21	-122 52 2.83			009100100S00		(04)													OR>25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J G N	S H V	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	INJC	18	F	OR-Y OR<25		000	006 000		00 00
04458 NONE N N	N	N	N N	N		08/06/2015 TH 6P 45 21 13.21	WASHINGTON SHERWOOD PORTLAND UA -122 52 2.83	1 14 MN 0 16.64	SW PACIFIC HY 99W SW SUNSET BLVD 009100100S00	STRGHT NE 04	(DIVMD) (04)	N UNKNOWN	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	F	UNK		026	000		29 00 29
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	30	F	OR-Y OR<25		000	011 000		00 00
03929 NONE N N	N	N	N N	N		06/15/2016 WE 3P 45 21 13.21	WASHINGTON SHERWOOD PORTLAND UA -122 52 2.83	1 14 MN 0 16.64	SW PACIFIC HY 99W SW ELWERT RD 009100100S00	STRGHT NE 04	(DIVMD) (04)	N UNKNOWN	N N	CLR DRY DAY	S-STRGHT SS-O PDO	01	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000		13 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
03493 NONE N N	N	N	N N	N		05/28/2016 SA 11A 45 21 12.76	WASHINGTON SHERWOOD PORTLAND UA -122 52 3.29	1 14 MN 0 16.65	SW PACIFIC HY 99W SW SUNSET BLVD 009100100S00	STRGHT NE 03	(DIVMD) (04)	Y UNKNOWN	N N	CLR DRY DAY	S-STRGHT REAR PDO	01	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000		29 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
80504 NONE N N	N	N	N N	N		05/17/2018 TH 4P 45 21 12.75	WASHINGTON SHERWOOD PORTLAND UA -122 52 3.29	1 14 MN 0 16.65	SW PACIFIC HY 99W SW SUNSET BLVD 009100100S00	STRGHT NE 03	(DIVMD) (04)	Y UNKNOWN	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	46	M	OR-Y OR<25		026	000		29 00 29
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	32	M	OR-Y OR<25		000	011 000		00 00
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	02	PSNG	INJC	31	M			000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R E A	M J U G	S I N H	W C O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
80239	N	N	N	N		03/09/2015	WASHINGTON	1	14		STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE						MO	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000		00
N						3P	PORTLAND UA	16.65		SW SUNSET BLVD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		026	000		29
N						45 21 12.76	-122 52 3.29			009100100S00		(04)													OR<25				
																	02	NONE 0	STOP										
																		PRVTE	NE-SW								011		00
																		PSNGR CAR		01	DRVR	INJC	60	F	OR-Y		000	000		00
																									OR<25				
00684	N	N	N	N	N	02/08/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
CITY						TH	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		UNKN	NE-SW									000		00
N						6P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		026	000		29
N						45 21 11.85	-122 52 4.18			009100100S00															UNK				
																	02	NONE 0	STOP										
																		PRVTE	NE-SW								011		00
																		PSNGR CAR		01	DRVR	INJC	49	F	OR-Y		000	000		00
																									OR<25				
02155	N	N	N	N	N	04/30/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT											07
CITY						MO	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000		00
N						5P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 21 11.85	-122 52 4.18			009100100S00															UNK				
																	02	NONE 9	STOP										
																		N/A	NE-SW								011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK				
07290	N	N	N	N		12/19/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT											07
CITY						WE	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000		00
N						4P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 21 11.85	-122 52 4.18			009100100S00															UNK				
																	02	NONE 9	STOP										
																		N/A	NE-SW								011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK				
00764	N	N	N	N		02/13/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE						WE	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000		00
N						2P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 21 11.85	-122 52 4.18			009100100S00															UNK				
																	02	NONE 9	STOP										
																		N/A	NE-SW								011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK				

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U G	M J / N I	S / C	W / O / R / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04035	N	N	N	N	N	N	08/08/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	TURN-L										29
CITY							TH	SHERWOOD	MN 0		SW ELWERT RD	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NW								000		00
N							3P	PORTLAND UA	16.67		SW PACIFIC HY 99W	05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		026	000		29
N							45 21 11.85	-122 52 4.18			009100100S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NW								011		00
																			PSNGR CAR		01	DRVR	INJC	38	M	OR-Y		000	000		00
																										OR<25				
																		02	NONE 0	STOP										
																			PRVTE	SW-NW								011		00
																			PSNGR CAR		02	PSNG	INJB	43	F			000	000		00
05867	N	N	N	N			10/28/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-STP	01	NONE 9	TURN-R										08
NONE							SU	SHERWOOD	MN 0		SW ELWERT RD	NW		TRF SIGNAL	N	WET	TURN		N/A	NW-SE								000		00
N							UNK	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00															UNK					
																		02	NONE 9	STOP										
																			N/A	NW-SE								012		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
00404	N	N	N	N	N	N	01/23/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
COUNTY							FR		MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S								000		00
N							6A	PORTLAND UA	16.67			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		020	000		04
N							45 21 11.85	-122 52 4.18			009100100S00															OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	S -W								000		00
																			PSNGR CAR		01	DRVR	INJC	29	M	OR-Y		000	000		00
																										OR>25				
03342	N	N	N	N	N	N	06/06/2017	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L									087	27,04
CITY							TU		MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -W								000		00
N							2P	PORTLAND UA	16.67			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	21	M	OR-Y		016,004,020	038		27,04
N							45 21 11.85	-122 52 4.18			009100100S00															OR>25					
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		01	DRVR	INJC	25	F	OR-Y		000	000		00
																										OR<25				
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		02	PSNG	NO<5	01	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		03	PSNG	NO<5	02	F			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U G / S	M J / N H / V L	S / C	W / O / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02588	N	N	N	N	N	N	05/23/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
CITY			WE				SHERWOOD		MN 0		SW ELWERT RD	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	NE-SW								000		00
N			5A				PORTLAND UA		16.67		SW PACIFIC HY 99W	01	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		000	000		00
N			45 21 11.85				-122 52 4.18				009100100S00															OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	SW-NW								000		00
																			PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		020	000		04
																										OR<25					
05940	N	N	N	N	N	N	11/03/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT										013	02,29
CITY			SA				SHERWOOD		MN 0		SW ELWERT RD	CN		L-GRN-SIG	N	WET	TURN		PRVTE	NE-SW								022	013	00
N			8P				PORTLAND UA		16.67		SW PACIFIC HY 99W	01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	55	F	SUSP		000	000		00
N			45 21 11.84				-122 52 4.18				009100100S00															OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	SW-NW								022		00
																			TRUCK		01	DRVR	NONE	35	M	OR-Y		004,028	000		02
																										OR<25					
																		03	NONE 0	STRGHT										
																			PRVTE	NE-SW								000		00
																			PSNGR CAR		01	DRVR	NONE	24	F	SUSP		026	000		29
																										N-RES					
06954	N	N	N	N	N	N	12/18/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	TURN-L										04
CITY			TU						MN 0			CN		L-GRN-SIG	N	WET	TURN		PRVTE	SW-NW								000		00
N			2P				PORTLAND UA		16.67			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	22	F	OR-Y		020,004	000		04
N			45 21 11.85				-122 52 4.19				009100100S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	NE-SW								000		00
																			PSNGR CAR		01	DRVR	INJB	56	F	OR-Y		000	000		00
																										OR<25					
05733	N	N	N	N	N	N	10/26/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 9	STRGHT										04
CITY			FR				SHERWOOD		MN 0		SW ELWERT RD	CN		TRF SIGNAL	N	WET	TURN		N/A	NE-SW								000		00
N			1P				PORTLAND UA		16.67		SW PACIFIC HY 99W	01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 21 11.85				-122 52 4.18				009100100S00															UNK					
																		02	NONE 9	TURN-L										
																			N/A	SW-NW								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
03825	N	N	N	N			07/08/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	BIKE	01	NONE 0	TURN-L										02	
NONE			WE						MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SE-SW								000		00
N			7P				PORTLAND UA		16.67			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	F	OTH-Y		027	000		02
N			45 21 11.85				-122 52 4.18				009100100S00															OR<25					
																				-										
																				STRGHT	01	BIKE	INJB	23	M		I INRD	000	035		00
																				NW SE										

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	C O R K	W N	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03238	N	N	N	N	N	N	N	06/25/2018	WASHINGTON	1 14			INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										010	04
CITY				MO				SHERWOOD	MN 0		SW ELWERT RD	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	NE-SW								000	010	00
N				2P				PORTLAND UA	16.67		SW PACIFIC HY 99W	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	18	F	OR-Y		020	000		04
N				45 21 11.85				-122 52 4.18			009100100S00							02	NONE 0	STRGHT						OR<25					
																			PRVTE	NW-SE									000		00
																			PSNGR CAR		01	DRVR	NONE	69	M	OR-Y		000	000		00
																										OR<25					
03471	Y	Y	N	N	N	N	N	06/22/2015	WASHINGTON	1 14			STRGHT		N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT									079,010	01
CITY				MO					MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	FIX		PRVTE	NE-SW								000	079,010	00
Y				2A				PORTLAND UA	16.68			01			N	DARK	INJ		MTRCYCLE		01	DRVR	INJA	44	M	OR-Y		047,080,081	000		01
N				45 21 11.41				-122 52 4.6			009100100S00		(04)													OR<25					
03619	N	N	N	N				07/05/2018	WASHINGTON	1 14			STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											29
NONE				TH					MN 0			UN	(NONE)	UNKNOWN	N	DRY	REAR		N/A	NE-SW								000		00
N				6P				PORTLAND UA	16.73			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 21 9.15				-122 52 6.49			009100100S00		(02)													UNK					
																		02	NONE 9	STRGHT											
																			N/A	NE-SW								006		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
05208	N	N	N	N				10/03/2018	WASHINGTON	2 14			STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE				WE				SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	SW-NE								000		00
N				6A				PORTLAND UA	16.55		SW SUNSET BLVD	00			N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		026	000		29
N				45 21 15.95				-122 51 58.08			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	SW-NE								011		00
																			PSNGR CAR		01	DRVR	INJB	36	F	OR-Y		000	000		00
																										OR<25					
01494	N	N	N	N				03/17/2017	WASHINGTON	2 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE				FR				SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	SW-NE								000		00
N				6A				PORTLAND UA	16.57		SW SUNSET BLVD	04			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		026	000		29
N				45 21 15.23				-122 51 59.17			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	SW-NE								011		00
																			PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP											
																			PRVTE	SW-NE								011		00
																			PSNGR CAR		02	PSNG	INJC	24	F			000	000		00
																		02	NONE 0	STOP											
																			PRVTE	SW-NE								011		00
																			PSNGR CAR		03	PSNG	NO<5	03	M			000	000		00

Not Related to Intersection

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R E A	M J U G	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04491	N	N	N	N			04/13/2016	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000	00
N							5P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 21 11.45	-122 52 3.31			009100200S00															UNK				
																		02	NONE 9	STOP										
																			N/A	NE-SW									011	00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																										UNK				
04670	N	N	N	N	N	N	07/31/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										07
CITY							MO	SHERWOOD	MN 0		SW ELWERT RD	NE		UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000	00
N							4P	PORTLAND UA	16.66		SW PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	16	M	OR-Y		043	000		07
N							45 21 11.45	-122 52 3.31			009100200S00															OR<25				
																		01	NONE 0	STRGHT										
																			PRVTE	NE-SW									000	00
																			PSNGR CAR		02	PSNG	INJC	18	F			000	000	00
																		02	NONE 0	STRGHT										
																			PRVTE	NE-SW									006	00
																			PSNGR CAR		01	DRVR	INJC	18	F	OR-Y		000	000	00
																										OR<25				
04289	N	N	N	N			04/27/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							TH	SHERWOOD	MN 0		SW PACIFIC HY 99W	E		TRF SIGNAL	N	DRY	REAR		N/A	SE-NW									000	00
N							7A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 21 11.45	-122 52 3.31			009100200S00															UNK				
																		02	NONE 9	STOP										
																			N/A	SE-NW									013	00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																										UNK				
04990	N	N	N	N	N	N	07/21/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY							TU	SHERWOOD	MN 0		SW ELWERT RD	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE									000	00
N							4P	PORTLAND UA	16.66		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	29	F	SUSP		043	000		07
N							45 21 11.45	-122 52 3.31			009100200S00															OR<25				
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011	00
																			PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		000	000	00
																										OR<25				
05463	N	N	N	N			09/04/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE							FR	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE									000	00
N							11A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		026	000		29
N							45 21 11.45	-122 52 3.31			009100200S00															OR<25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	C N	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																											OR<25					
01834	Y	Y	N	N	N	N	N	03/19/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										013	07,30
CITY								SA	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								6P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	NONE		043,050	000		07,30
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								012	013	00
																				PSNGR CAR		01	DRVR	INJC	46	M	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								012	013	00
																				PSNGR CAR		02	PSNG	INJC	28	F			000	000		00
																			03	NONE 0	STOP										
																				PRVTE	SW-NE								022		00
																				PSNGR CAR		01	DRVR	NONE	34	M	OR-Y		000	000		00
																											OR<25					
02965	N	N	N	N				05/06/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE								FR	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								8A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		026	000		29
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJC	40	M	OR-Y		000	000		00
																											OR<25					
06420	N	N	N	N	N	N	N	09/22/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	S-STRGHT	01	NONE 0	STRGHT										087	07
CITY								TH	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	SNO	REAR		PRVTE	SW-NE								000	087	00
N								5P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y		043	000		07
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STRGHT										
																				PRVTE	SW-NE								006	087	00
																				PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		000	000		00
																											OR<25					
08928	N	N	N	N				12/25/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE								SU	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								12P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y		026	000		29
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJC	59	F	OR-Y		000	000		00
																											OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U N V	S I H L	W C O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																		02	NONE 0 / PRVTE / PSNGR CAR	STOP / SW-NE	02	PSNG	INJC	40	M			000	011 / 000		00 / 00
																		02	NONE 0 / PRVTE / PSNGR CAR	STOP / SW-NE	03	PSNG	INJC	54	M			000	011 / 000		00 / 00
07321 / CITY	N	N	N	N	N	N	11/18/2017 / SA / 8P / 45 21 11.45	WASHINGTON / SHERWOOD / PORTLAND UA / -122 52 3.31	2 / MN / 16.66	14 / 0	SW PACIFIC HY 99W / SW SUNSET BLVD / 009100200S00	INTER / SW / 06	CROSS / 0	N / TRF SIGNAL	N / N	FOG / DRY / DARK	S-STRGHT / REAR / PDO	01	NONE 9 / N/A / PSNGR CAR	STRGHT / SW-NE	01	DRVR	NONE	00	Unk	UNK / UNK		000	000		07 / 00 / 00
																		02	NONE 9 / N/A / PSNGR CAR	STRGHT / SW-NE	01	DRVR	NONE	00	Unk	UNK / UNK		000	006		00 / 00
01690 / CITY	N	N	N	N	N	N	04/04/2019 / TH / 7A / 45 21 11.45	WASHINGTON / SHERWOOD / PORTLAND UA / -122 52 3.31	2 / MN / 16.66	14 / 0	SW PACIFIC HY 99W / SW SUNSET BLVD / 009100200S00	INTER / SW / 06	CROSS / 0	N / TRF SIGNAL	N / N	CLD / WET / DAY	S-1STOP / REAR / INJ	01	NONE 0 / PRVTE / PSNGR CAR	STRGHT / SW-NE	01	DRVR	NONE	23	F	OR-Y / OR<25	043	000		07 / 00 / 07
																		02	NONE 0 / PRVTE / PSNGR CAR	STOP / SW-NE	01	DRVR	INJC	27	M	OR-Y / OR<25	000	000	011		00 / 00 / 00
03081 / CITY	N	N	N	N	N	N	06/16/2019 / SU / 3P / 45 21 11.45	WASHINGTON / SHERWOOD / PORTLAND UA / -122 52 3.31	2 / MN / 16.66	14 / 0	SW PACIFIC HY 99W / SW SUNSET BLVD / 009100200S00	INTER / SW / 06	CROSS / 0	N / TRF SIGNAL	N / N	CLR / DRY / DAY	S-1STOP / REAR / INJ	01	NONE 0 / PRVTE / PSNGR CAR	STRGHT / SW-NE	01	DRVR	INJC	28	F	OR-Y / OR<25	026	000		29 / 00 / 29
																		02	NONE 0 / PRVTE / PSNGR CAR	STOP / SW-NE	01	DRVR	NONE	43	F	OR-Y / OR>25	000	000	011		00 / 00 / 00
01913 / NO RPT	N	N	N	N			04/16/2019 / TU / 4P / 45 21 11.45	WASHINGTON / SHERWOOD / PORTLAND UA / -122 52 3.31	2 / MN / 16.66	14 / 0	SW PACIFIC HY 99W / SW SUNSET BLVD / 009100200S00	INTER / SW / 06	CROSS / 0	N / TRF SIGNAL	N / N	CLR / DRY / DAY	S-1STOP / REAR / INJ	01	NONE 0 / UNKN / PSNGR CAR	STRGHT / SW-NE	01	DRVR	NONE	00	F	UNK / UNK	026	000		29 / 00 / 29
																		02	NONE 0 / PRVTE / PSNGR CAR	STOP / SW-NE	01	DRVR	INJC	28	M	OR-Y / OR<25	000	000	011		00 / 00 / 00
																		02	NONE 0 / PRVTE / PSNGR CAR	STOP / SW-NE	02	PSNG	INJC	29	M		000	000	011		00 / 00 / 00

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U G	M J / N V	S / H L	W / O / R / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02665	N	N	N	N	N	N	05/25/2019	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										27,29
CITY			SA					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE								000		00
N			4P					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	21	M	OR-Y		016,026	038		27,29
N			45 21 11.45					-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0	STOP									011		00
																			RENTL	SW-NE										
																			PSNGR CAR		01	DRVR	INJC	30	F	OTH-Y		000	000		00
																										N-RES					
																		02	NONE 0	STOP									011		00
																			RENTL	SW-NE										
																			PSNGR CAR		02	PSNG	INJC	36	M			000	000		00
																		02	NONE 0	STOP									011		00
																			RENTL	SW-NE										
																			PSNGR CAR		03	PSNG	INJC	21	M			000	000		00
06006	N	N	N	N		Y	11/15/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										10
CITY			FR					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE								000		00
N			6A					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		000	000		00
N			45 21 11.45					-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0	STOP											
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		009	000		10
																										OR<25					
06647	N	N	N	N		Y	12/14/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										27,07
CITY			SA					SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE								000		00
N			1P					PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	F	SUSP		016,043	038		27,07
N			45 21 11.45					-122 52 3.31			009100200S00															UNK					
																		02	NONE 0	STOP											
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP											
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		02	PSNG	INJC	63	M			000	000		00
04827	N	N	N	N	N	N	08/24/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY			MO					SHERWOOD	MN 0		SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW-NE								000		00
N			1P					PORTLAND UA	16.66		SW SUNSET BLVD	02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	93	F	OR-Y		020	000		04
N			45 21 11.45					-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0	TURN-L											
																			PRVTE	SE-SW									000		00
																			PSNGR CAR		01	DRVR	INJB	35	F	OR-Y		000	000		00
																										OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	C O R L	W K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 0 PRVTE PSNGR CAR	TURN-L SE-SW	02	PSNG	INJC	05	M			000	000		00 00
05220	N	N	N	N	N	N	10/03/2018	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04,27
CITY		WE						SHERWOOD	MN 0	SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SE-NW								000		00
N		11A						PORTLAND UA	16.66	SW SUNSET BLVD	02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		000	000		00
N		45 21 11.45						-122 52 3.31		009100200S00															OR<25					
																	01	NONE 0 PRVTE PSNGR CAR	STRGHT SE-NW	02	PSNG	INJC	24	F			000	000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	INJC	55	M	OTH-Y N-RES		020,016	000 038		00 04,27
06861	N	N	N	N	N	N	10/30/2017	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L											04
CITY		MO						SHERWOOD	MN 0	SW ELWERT RD	CN		TRF SIGNAL	N	DRY	TURN		N/A	SE-SW								000		00
N		6A						PORTLAND UA	16.66	SW PACIFIC HY 99W	03	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 21 11.45						-122 52 3.31		009100200S00															UNK					
																	02	NONE 9 N/A PSNGR CAR	STRGHT NW-SE	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
05152	N	N	N	N	N	N	08/23/2017	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY		WE						SHERWOOD	MN 0	SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SW-NE								000		00
N		12P						PORTLAND UA	16.66	SW SUNSET BLVD	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	59	M	EXP		020	000		04
N		45 21 11.45						-122 52 3.31		009100200S00															OR<25					
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT NW-SE	01	DRVR	INJC	36	F	OR-Y OR<25		000	000 000		00 00
																	03	NONE 0 PRVTE PSNGR CAR	TURN-R SE-NE	01	DRVR	INJC	19	F	OR-Y OR<25		000	022 000		00 00
02603	N	N	N	N	N	N	05/13/2015	WASHINGTON	2 14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
CITY		WE							MN 0		UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N		7A						PORTLAND UA	16.68		03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	48	F	OR-Y		043	000		07
N		45 21 10.55						-122 52 4.06		009100200S00		(04)													OR<25					
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	01	DRVR	INJC	45	F	OR-Y OR<25		000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N V	W C O H	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06998	N	Y	N	N	N	12/20/2018	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
CITY						TH		MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N									000		00
N						5P	PORTLAND UA	16.68			04			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		043	000		07
N						45 21 10.56	-122 52 4.05			009100200S00		(04)													OR<25					
																	02	NONE 0	STOP										
																		PRVTE	S -N									011		00
																		PSNGR CAR		01	DRVR	INJC	30	M	OTH-Y		000	000		00
																									N-RES				
04365	N	N	N	N	N	08/02/2015	WASHINGTON	2	14		STRGHT		N	N	CLD	S-1STOP	01	NONE 0	STRGHT										33
CITY						SU		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	S -N									000		00
N						9P	PORTLAND UA	16.69			03			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	38	F	SUSP		051,026	000		33
N						45 21 10.11	-122 52 4.43			009100200S00		(04)													OR<25					
																	02	NONE 0	STOP										
																		PRVTE	S -N									011		00
																		PSNGR CAR		01	DRVR	INJB	60	F	OTH-Y		000	000		00
																									N-RES				
06659	N	N	N	N	N	11/06/2015	WASHINGTON	2	14		STRGHT		Y	N	FOG	S-1STOP	01	NONE 0	STRGHT										07
CITY						FR		MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N									000		00
N						7A	PORTLAND UA	16.69			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		043,026	000		07
N						45 21 10.11	-122 52 4.43			009100200S00		(02)													OR<25					
																	02	NONE 0	STOP										
																		PRVTE	S -N									011		00
																		PSNGR CAR		01	DRVR	NONE	31	F	OR-Y		000	000		00
																									OR<25				
08008	N	N	N	N	N	12/14/2017	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										087	29
CITY						TH		MN 0			UN	(DIVMD)	TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									000	087	00
N						1P	PORTLAND UA	16.69			03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	68	M	OR-Y		042	000		29
N						45 21 10.11	-122 52 4.43			009100200S00		(04)													OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	S -N									006	087	00
																		PSNGR CAR		01	DRVR	NONE	68	F	OR-Y		000	000		00
																									OR<25				
04297	N	Y	N	N	N	08/24/2019	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										07
CITY						SA		MN 0			UN	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	S -N									000		00
N						3P	PORTLAND UA	16.69			03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	M	OTH-Y		043	000		07
N						45 21 10.11	-122 52 4.44			009100200S00		(04)													OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	S -N									006		00
																		PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		000	000		00
																									OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	S -N									006		00
																		PSNGR CAR		02	PSNG	INJA	26	M			000	000		00
06116	N	N	N	N	N	10/02/2017	WASHINGTON	2	14		STRGHT		N	N	CLD	S-STRGHT	01	NONE 9	STRGHT										27,07
CITY						MO		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	S -N									000		00
N						5A	PORTLAND UA	16.69			04			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 21 10.11	-122 52 4.43			009100200S00		(04)													UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	006 000		00 00
05060 CITY N N	N	N	N	N			09/03/2015 TH 5P 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 009100200S00		STRGHT UN 03	(DIVMD) (04)	N UNKNOWN	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	26	F	OR-Y OR<25		043	000	013	07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	27	F	OR-Y OR<25		000	011 000	013	00 00
																	03	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	NONE	30	F	OR-Y OR<25		000	022 000		00 00
07488 CITY N N	N	N	N	N	N	N	12/08/2015 TU 12P 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 009100200S00		STRGHT UN 03	(DIVMD) (05)	N L-GRN-SIG	N N	RAIN WET DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	INJC	25	F	OR-Y OR<25		043	000		07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	NONE	57	F	OR-Y OR<25	000	000	011 000		00 00
07584 NONE N N	N	N	N	N			12/11/2015 FR 7A 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 009100200S00		STRGHT UN 03	(DIVMD) (04)	N UNKNOWN	N N	UNK UNK DAWN	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	32	F	OR-Y UNK		026	000 000		29 00 29
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	40	F	OR-Y OR<25	000	000	011 000		00 00
04867 COUNTY N N	N	N	N	N	N	N	09/21/2019 SA 10A 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.77	2 14 MN 0 16.70 009100200S00		STRGHT UN 04	(DIVMD) (04)	N NONE	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	31	M	OTH-Y OR<25		043	000		07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	01	DRVR	INJC	23	F	OR-Y OR<25	000	000	011 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	02	PSNG	INJC	22	F		000	000	011 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	03	PSNG	INJC	17	M		000	000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U N V	S I H L	C N R K	W O	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06414	N	N	N	N	N	N	N	09/22/2016	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											29
CITY				TH						MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	S -N									000		00
N				1P					PORTLAND UA	16.71			04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 21 9.19				-122 52 5.13				009100200S00		(04)													UNK					
																			02	NONE 9	STRGHT											
																				N/A	S -N									000		00
																				TRUCK		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
01275	N	N	N	N	N	N	N	03/05/2017	WASHINGTON	2	14		STRGHT		N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07,32
CITY				SU						MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	S -N								000		00
N				11A					PORTLAND UA	16.71			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	81	M	OR-Y		043,052	000		07,32
N				45 21 9.19				-122 52 5.13				009100200S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	S -N								011	013	00
																				PSNGR CAR		01	DRVR	INJC	69	M	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP											
																				PRVTE	S -N								011	013	00
																				PSNGR CAR		02	PSNG	INJC	63	F			000	000		00
																			03	NONE 0	STOP											
																				PRVTE	S -N								022		00
																				PSNGR CAR		01	DRVR	INJC	71	M	OR-Y		000	000		00
																											OR<25					
05618	N	N	N	N	N	N	N	09/20/2017	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	07
CITY				WE						MN 0			UN	(DIVMD)	TRF SIGNAL	N	WET	REAR		PRVTE	S -N								000		00
N				3P					PORTLAND UA	16.71			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		043	000		07
N				45 21 9.19				-122 52 5.13				009100200S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	S -N								011	013	00
																				PSNGR CAR		01	DRVR	INJB	52	M	OR-Y		000	000		00
																											OR<25					
																			03	NONE 0	STOP											
																				PRVTE	S -N								022		00
																				PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000		00
																											OR<25					
01240	N	N	N	N	N	N	N	03/12/2019	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
COUNTY				TU						MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N				7A					PORTLAND UA	16.71			04			N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		043	000		07
N				45 21 9.18				-122 52 5.13				009100200S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	S -N								011		00
																				PSNGR CAR		01	DRVR	INJC	43	M	OR-Y		000	000		00
																											OR<25					

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 17.41 to 17.51 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

1 - 7 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	M R G S	J U N V	S I H L	C N	O W R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03760	N	N	N	N				07/24/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	ANIMAL	01	NONE 9	STRGHT										035	12
NONE								WE		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	OTH		N/A	N -S									000		00
N								9P	PORTLAND UA	17.42			03			N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 35.36	-122 52 24.81			009100100S00		(04)													UNK					
06064	N	N	N	N				09/29/2017	WASHINGTON	1 14			INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT											29
NONE								FR		MN 0			N		STOP SIGN	N	WET	REAR		N/A	N -S									000		00
N								2P	PORTLAND UA	17.47			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															UNK					
																			02	NONE 9	STRGHT											
																				N/A	N -S									000		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
04243	N	N	N	N				08/16/2018	WASHINGTON	1 14			INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE								TH		MN 0			E		STOP SIGN	N	DRY	REAR		PRVTE	E -W									000		00
N								4P	PORTLAND UA	17.47			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		026	000		29
N								45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																			02	NONE 0	STOP											
																				PRVTE	E -W									012		00
																				PSNGR CAR		01	DRVR	INJC	53	F	OR-Y		000	000		00
																											OR<25					
01401	N	N	N	N	N	N		03/20/2018	WASHINGTON	1 14			INTER	CROSS	N	Y	CLD	FIX OBJ	01	NONE 9	STRGHT										058	26
COUNTY								TU		MN 0			S		STOP SIGN	N	DRY	FIX		N/A	N -S									000		00
N								2P	PORTLAND UA	17.47			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															UNK					
00236	N	N	N	N				01/15/2015	WASHINGTON	1 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY								TH		MN 0			CN		STOP SIGN	N	WET	TURN		PRVTE	N -S									000		00
N								5P	PORTLAND UA	17.47			01	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																			02	NONE 0	TURN-L											
																				PRVTE	E -S									015		00
																				PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		028	000		02
																											OR<25					
08443	N	N	N	N	N	N		12/09/2016	WASHINGTON	1 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											03
COUNTY								FR		MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	N -S									000		00
N								3P	PORTLAND UA	17.47			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															UNK					
																			02	NONE 9	STRGHT											
																				N/A	E -W									000		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
07975	N	N	N	N				12/13/2017	WASHINGTON	1 14			INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											03
COUNTY								WE		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	E -W									000		00
N								7P	PORTLAND UA	17.47			01	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	48	M	OR-Y		021	000		03
N								45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																			02	NONE 0	STRGHT											
																				PRVTE	N -S									000		00
																				PSNGR CAR		01	DRVR	INJC	56	F	OR-Y		000	000		00
																											OR<25					

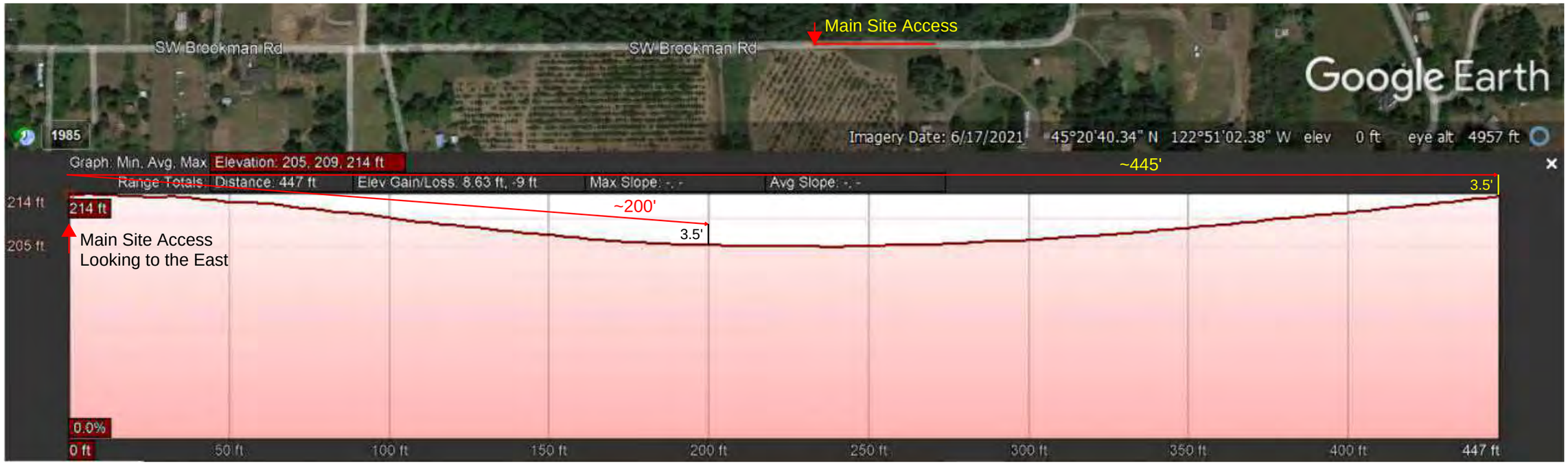
SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	W C O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01598	N	N	N	N		03/21/2017	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											02
NO RPT						TU		MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	E -W									000		00
N						7A	PORTLAND UA	17.47			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															UNK					
																	02	NONE 9	STRGHT											
																		N/A	N -S									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
02701	N	N	N	N		05/18/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											02
NO RPT						MO		MN 0			CN		STOP SIGN	N	DRY	TURN		PRVTE	W -E									000		00
N						5P	PORTLAND UA	17.47			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	40	F	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	TURN-L											
																		PRVTE	E -S									000		00
																		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		004,028	000		02
																									OR<25					
01335	N	N	N	N	N N	03/08/2017	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT											058	02
COUNTY						WE		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	W -E									000	053	00
N						5P	PORTLAND UA	17.47			03	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	N -S									000		00
																		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		028	000		02
																									OR<25					
05249	N	N	N	N		08/27/2017	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L											02
NONE						SU		MN 0			CN		STOP SIGN	N	DRY	TURN		N/A	E -S									000		00
N						12P	PORTLAND UA	17.47			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															UNK					
																	02	NONE 9	STRGHT											
																		N/A	W -E									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
03053	N	N	N	N	N N	06/15/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						SA		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S									000		00
N						2P	PORTLAND UA	17.47			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	24	M	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	W -E									015		00
																		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		028	000		02
																									OR<25					
05515	N	N	N	N	N N	10/24/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L											02
COUNTY						TH		MN 0			CN		STOP SIGN	N	DRY	TURN		PRVTE	E -S									000		00
N						11A	PORTLAND UA	17.47			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	W -E									000		00
																		PSNGR CAR		01	DRVR	INJC	47	F	OR-Y		028	000		02
																									OR<25					

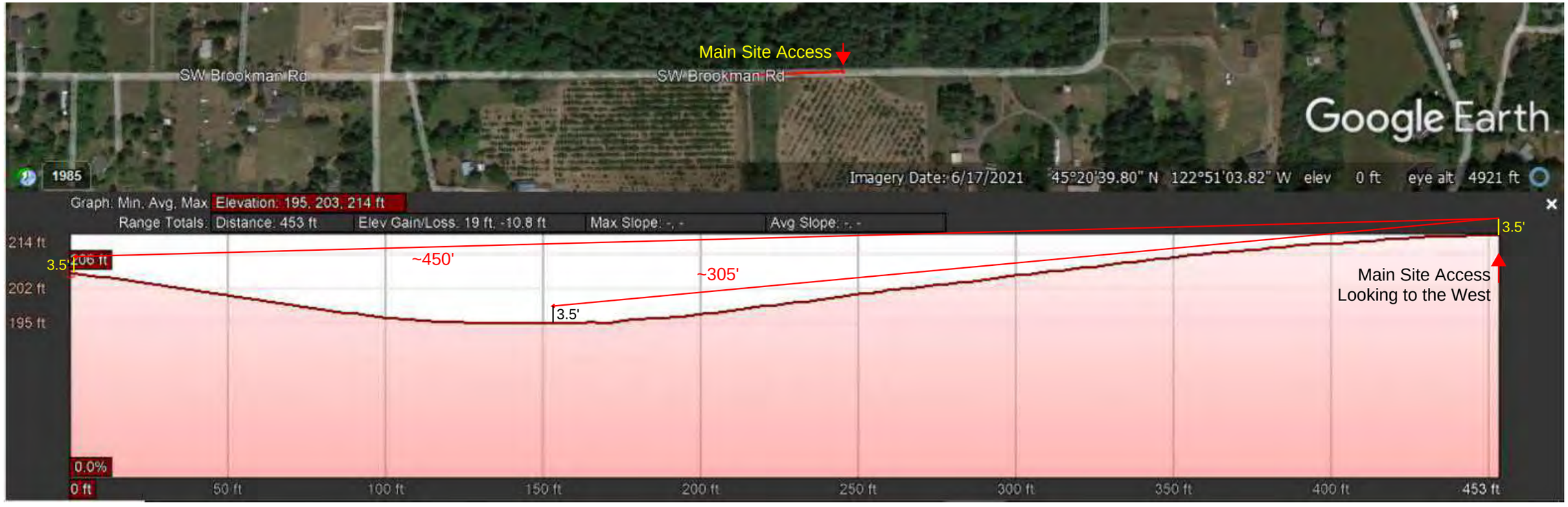
SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U V	S N H L	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06735	N	N	N	N	N	N	12/19/2019	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										02
COUNTY							TH		MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	W -E								000		00
N							4P	PORTLAND UA	17.47			03	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 32.89	-122 52 26.13			009100100S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	N -S								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
03675	N	N	N	N	N	N	07/20/2019	WASHINGTON	1	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										010	13
COUNTY							SA		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	SS-O		PRVTE	N -S								000	010	00
N							9P	PORTLAND UA	17.50			04			N	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	21	M	UNK		045	000		13
N							45 20 31.43	-122 52 26.93			009100100S00		(04)													OR>25					
																		01	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		02	PSNG	INJB	00	M			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		01	DRVR	INJB	42	M	OR-Y		000	000		00
																										OR>25				
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		02	PSNG	INJB	13	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		03	PSNG	INJB	15	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		04	PSNG	INJB	12	F			000	000		00
00536	Y	N	N	N	N	N	01/28/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE 9	TURN-R											01,08
COUNTY							SA		MN 0			E		STOP SIGN	N	DRY	TURN		N/A	S -E								000		00
N							4P	PORTLAND UA	17.46			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															UNK					
																		02	NONE 9	STOP										
																			N/A	E -W								011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
05762	N	N	N	N	N	N	09/18/2017	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											27,02
COUNTY							MO		MN 0			S		STOP SIGN	N	WET	TURN		N/A	N -S								000		00
N							10A	PORTLAND UA	17.46			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															UNK					
																		02	NONE 9	TURN-R										
																			N/A	W -S								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				

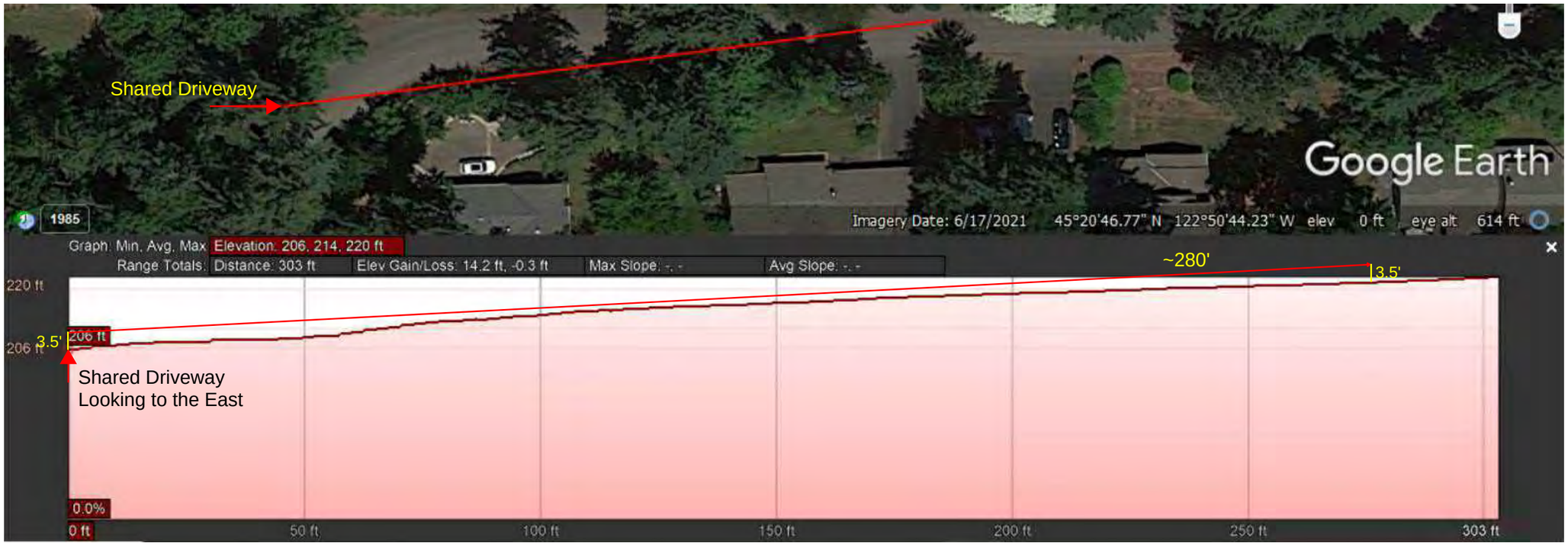
SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U V	S I N L	C N H	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05017	N	N	N	N	N	N	N	09/29/2019	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	TURN-L										08
COUNTY				SU						MN 0			W		STOP SIGN	N	DRY	TURN		PRVTE	E -S								000		00
N				2P				PORTLAND UA		17.46			05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		002	000		08
N				45 20 32.9				-122 52 24.87				009100200S00															OR<25					
																			02	NONE 0	STOP									011		00
																				PRVTE	W -E										
																				PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000		00
																											OR<25					
02243	N	N	N	N	N	N	N	04/27/2015	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02	
COUNTY				MO						MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N				2P				PORTLAND UA		17.46			01	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJA	68	M	OTH-Y		000	000		00
N				45 20 32.9				-122 52 24.87				009100200S00															N-RES					
																			02	NONE 0	STRGHT									015		00
																				PRVTE	E -W										
																				PSNGR CAR		01	DRVR	NONE	74	F	OR-Y		028	000		02
																											OR<25					
03254	N	N	N	N				05/18/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										02	
NO RPT				WE						MN 0			CN		STOP SIGN	N	DRY	TURN		N/A	W -N								000		00
N				6A				PORTLAND UA		17.46			02	0		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 20 32.91				-122 52 24.87				009100200S00															UNK					
																			02	NONE 0	STRGHT									000		00
																				PRVTE	S -N										
																				PSNGR CAR		02	PSNG	INJC	52	F			000	000		00
																			01	NONE 0	STRGHT									000		00
																				PRVTE	S -N										
																				PSNGR CAR		03	PSNG	INJC	32	F			000	000		00
																			02	NONE 0	STRGHT									000		00
																				PRVTE	E -W										
																				PSNGR CAR		01	DRVR	INJB	60	M	OR-Y		028	000		02
																											OR<25					
																			02	NONE 0	STRGHT									000		00
																				PRVTE	E -W										
																				PSNGR CAR		02	PSNG	INJB	55	M			000	000		00
07013	N	N	N	N	N	N	N	12/20/2018	WASHINGTON	2 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										02	
COUNTY				TH						MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	E -W								000		00
N				6P				PORTLAND UA		17.46			02	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 20 32.9				-122 52 24.87				009100200S00															UNK					

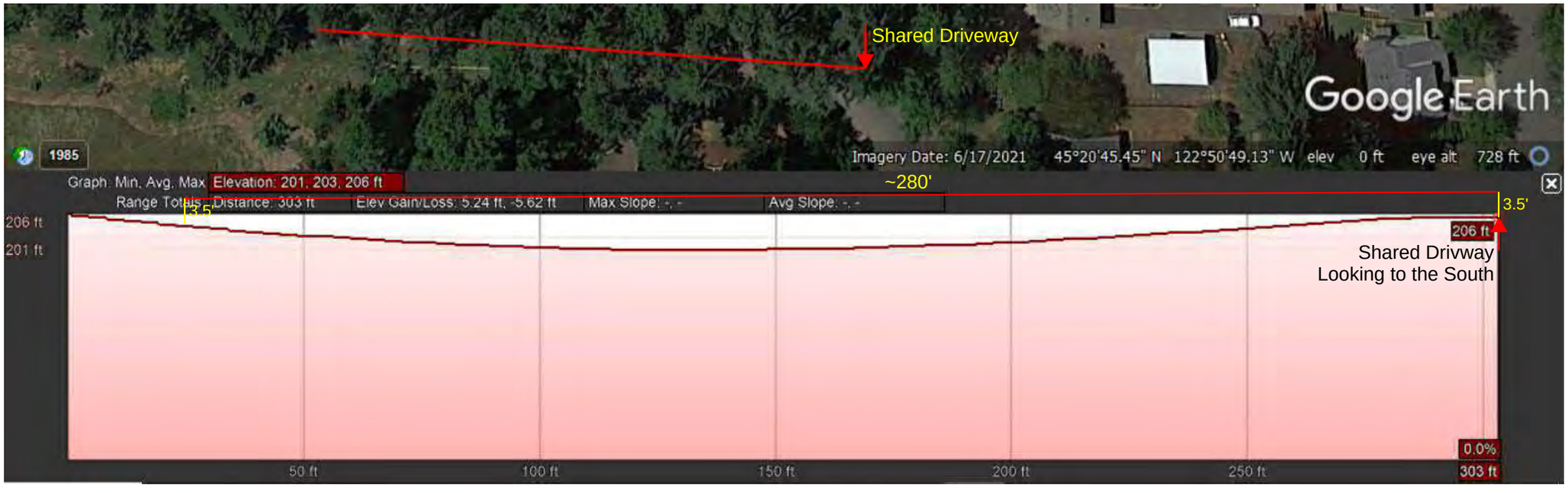
SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																		02	NONE 9	STRGHT										
																			N/A	S -N								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
05536	N	N	N	N	N	N	10/17/2018	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02
COUNTY							WE		MN 0			CN		STOP SIGN	N	DRY	ANGL		N/A	S -N								000		00
N							4P	PORTLAND UA	17.46			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	E -W								015		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
00282	N	N	N	N	N	N	01/16/2019	WASHINGTON	2 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY							WE		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	S -N								000		00
N							7P	PORTLAND UA	17.46			02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	INJB	53	F	OR-Y		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								015		00
																			PSNGR CAR		01	DRVR	INJC	30	M	OR-Y		028	000		02
																										OR<25					
01141	N	N	N	N	N	N	03/05/2019	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY							TU		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N							5P	PORTLAND UA	17.46			02	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	65	M	OR-Y		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								015		00
																			PSNGR CAR		01	DRVR	INJB	63	M	OR-Y		028	000		02
																										OR<25					
00125	N	N	N	N			01/08/2019	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY							TU		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	S -N								000		00
N							8A	PORTLAND UA	17.46			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								015		00
																			PSNGR CAR		01	DRVR	NONE	36	M	OR-Y		028	000		02
																										OR<25					
06521	N	N	N	N	N	N	12/10/2019	WASHINGTON	2 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT									079	03
COUNTY							TU		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	E -W								000		00
N							5P	PORTLAND UA	17.46			02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		021	000		03
N							45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	S -N								000		00
																			PSNGR CAR		01	DRVR	INJB	23	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	S -N								000		00
																			PSNGR CAR		02	PSNG	INJC	22	F			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	C O R K	W	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																			03	NONE 0 PRVTE PSNGR CAR	STRGHT S -N								022 000	079	00 00
06925 COUNTY N N	N	N	N	N	N	N		12/27/2019 FR 7P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 02	CROSS 0	N STOP SIGN	N N N	CLR DRY DLIT	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	62	M	OR-Y OR<25		000	000	079	27,02,32 00 00
																			02	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	INJC	42	M	OR-Y OR<25		016,028,052	000 038	079	00 27,02,32
07481 COUNTY N N	N	N	N	N	N	N		11/25/2017 SA 8P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 04	CROSS 0	N STOP SIGN	N N N	CLD WET DARK	ANGL-OTH ANGL PDO	01	NONE 9 N/A PSNGR CAR	STRGHT W -E	01	DRVR	NONE	00	Unk	UNK UNK		000	000		02,32 00 00
																			02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
02527 COUNTY N N	N	N	N	N	N	N		05/19/2018 SA 2P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 04	CROSS 0	N STOP SIGN	N N N	CLR DRY DAY	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	16	F	OR-Y OR<25		028,052	000		02,32 00 02,32
																			01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	02	PSNG	INJB	16	M			000	000 015 000		00 00 00
																			02	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	53	M	OTH-Y N-RES		000	000 000		00 00


Main Site Access
SW Brookman Rd
SW Brookman Rd
Google Earth
1985
Imagery Date: 6/17/2021 45°20'40.34" N 122°51'02.38" W elev 0 ft eye alt 4957 ft
Graph: Min, Avg, Max Elevation: 205, 209, 214 ft
Range Totals: Distance: 447 ft Elev Gain/Loss: 8.63 ft, -9 ft Max Slope: -, - Avg Slope: -, -
~445'
3.5'
214 ft
214 ft
205 ft
~200'
3.5'
Main Site Access
Looking to the East
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
300 ft
350 ft
400 ft
447 ft


Main Site Access
SW Brookman Rd
SW Brookman Rd
Google Earth
1985
Imagery Date: 6/17/2021 45°20'39.80" N 122°51'03.82" W elev 0 ft eye alt 4921 ft
Graph: Min, Avg, Max Elevation: 195, 203, 214 ft
Range Totals: Distance: 453 ft Elev Gain/Loss: 19 ft, -10.8 ft Max Slope: -, - Avg Slope: -, -
3.5'
214 ft
206 ft
202 ft
195 ft
3.5'
~450'
~305'
3.5'
Main Site Access
Looking to the West
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
300 ft
350 ft
400 ft
453 ft


Shared Driveway
Google Earth
1985
Imagery Date: 6/17/2021 45°20'46.77" N 122°50'44.23" W elev 0 ft eye alt 614 ft
Graph: Min, Avg, Max Elevation: 206, 214, 220 ft
Range Totals: Distance: 303 ft Elev Gain/Loss: 14.2 ft, -0.3 ft Max Slope: -, - Avg Slope: -, -
~280'
3.5'
220 ft
206 ft
3.5'
206 ft
Shared Driveway
Looking to the East
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
303 ft


Shared Driveway
Google Earth
1985
Imagery Date: 6/17/2021 45°20'45.45" N 122°50'49.13" W elev 0 ft eye alt 728 ft
Graph: Min, Avg, Max Elevation: 201, 203, 206 ft
Range Totals: Distance: 303 ft Elev Gain/Loss: 5.24 ft, -5.62 ft Max Slope: -, - Avg Slope: -, -
~280'
3.5'
3.5'
206 ft
201 ft
206 ft
Shared Drivway
Looking to the South
0.0%
50 ft
100 ft
150 ft
200 ft
250 ft
303 ft

Left-Turn Lane Warrant Analysis

Project: Cedar Creek Gardens
Intersection: Main Access
Date: 11/4/2021
Scenario: Year 2024 Buildout Conditions - AM Peak Hour

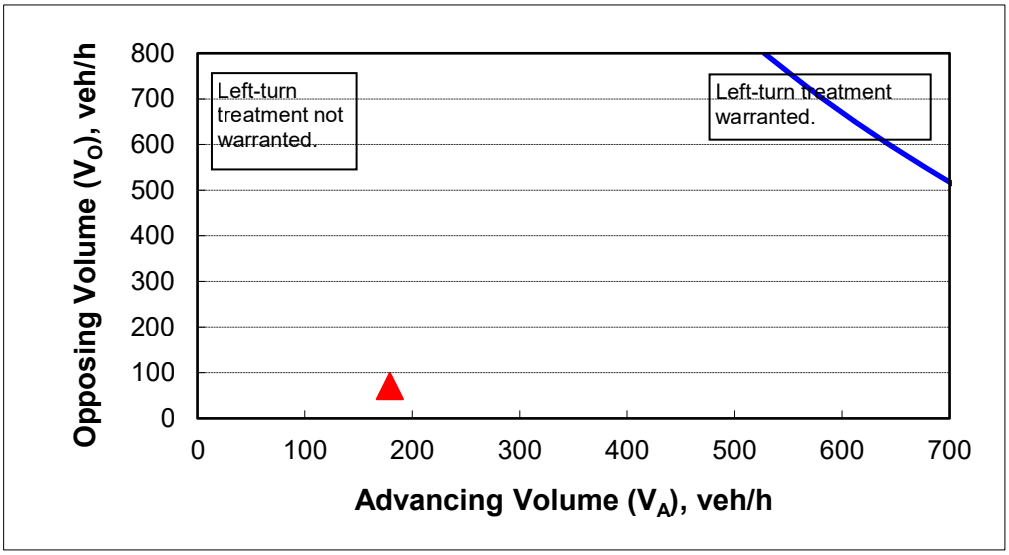
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Left-turns in advancing volume (V_A), veh/hr:	4
Advancing volume (V_A), veh/h:	179
Opposing volume (V_O), veh/h:	71

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1145
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Cedar Creek Gardens
Intersection: Main Access
Date: 11/4/2021
Scenario: Year 2024 Buildout Conditions - PM Peak Hour

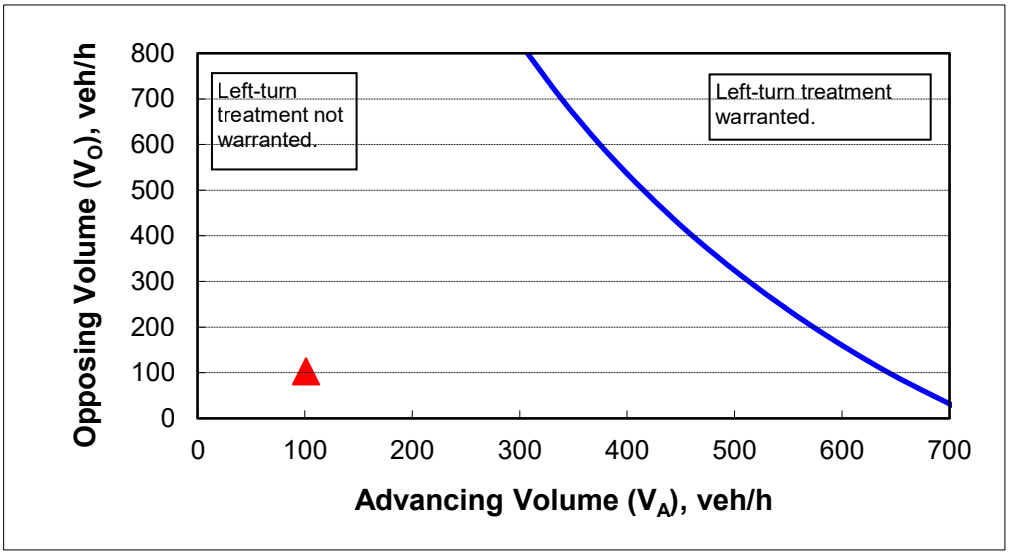
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Left-turns in advancing volume (V_A), veh/hr:	7
Advancing volume (V_A), veh/h:	101
Opposing volume (V_O), veh/h:	103

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	641
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Level of Service Definitions

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

- *Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.
- *Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.
- *Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.
- *Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.
- *Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.
- *Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

Level of Service Criteria
For Signalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

Level of Service Criteria
For Unsignalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

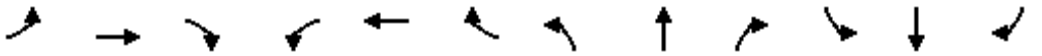
11/10/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	114	244	147	195	244	269	1644	114	141	800	16
Future Volume (vph)	22	114	244	147	195	244	269	1644	114	141	800	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3212		3367	3471	1553	3213	3312	1482
Flt Permitted	0.29	1.00	1.00	0.51	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	537	1845	1568	933	3212		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	120	257	155	205	257	283	1731	120	148	842	17
RTOR Reduction (vph)	0	0	216	0	153	0	0	0	49	0	0	8
Lane Group Flow (vph)	23	120	41	155	309	0	283	1731	71	148	842	9
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	21.5	18.2	18.2	27.1	21.0		13.5	62.4	62.4	8.2	57.1	57.1
Effective Green, g (s)	23.5	19.2	18.2	29.1	22.0		14.5	63.4	63.4	9.2	58.1	58.1
Actuated g/C Ratio	0.20	0.17	0.16	0.25	0.19		0.13	0.55	0.55	0.08	0.51	0.51
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	308	248	286	615		424	1915	856	257	1674	749
v/s Ratio Prot	0.01	0.07		c0.03	0.10		c0.08	c0.50		0.05	0.25	
v/s Ratio Perm	0.02		0.03	c0.10					0.05			0.01
v/c Ratio	0.15	0.39	0.16	0.54	0.50		0.67	0.90	0.08	0.58	0.50	0.01
Uniform Delay, d1	37.1	42.6	41.8	36.0	41.6		47.9	23.0	12.1	51.0	18.8	14.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8	0.3	2.1	0.6		4.0	6.5	0.0	3.1	0.2	0.0
Delay (s)	37.5	43.4	42.1	38.1	42.2		51.9	29.5	12.1	54.1	19.1	14.1
Level of Service	D	D	D	D	D		D	C	B	D	B	B
Approach Delay (s)		42.2			41.2			31.5			24.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	114.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	114	244	147	195	244	269	1644	114	141	800	16
Future Volume (veh/h)	22	114	244	147	195	244	269	1644	114	141	800	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	23	120	46	155	205	99	283	1731	67	148	842	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	190	198	153	245	320	149	386	2041	910	282	1868	833
Arrive On Green	0.04	0.11	0.10	0.07	0.14	0.13	0.11	0.58	0.58	0.09	0.56	0.56
Sat Flow, veh/h	1767	1856	1572	1767	2337	1086	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	23	120	46	155	153	151	283	1731	67	148	842	12
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1660	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	1.2	6.4	2.8	7.0	8.4	8.9	8.3	42.0	1.9	4.5	15.3	0.4
Cycle Q Clear(g_c), s	1.2	6.4	2.8	7.0	8.4	8.9	8.3	42.0	1.9	4.5	15.3	0.4
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	190	198	153	245	241	227	386	2041	910	282	1868	833
V/C Ratio(X)	0.12	0.61	0.30	0.63	0.63	0.67	0.73	0.85	0.07	0.53	0.45	0.01
Avail Cap(c_a), veh/h	244	306	244	245	291	274	528	2411	1075	285	2086	930
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	43.9	43.2	38.7	42.0	42.5	44.1	17.7	9.3	45.0	13.5	10.2
Incr Delay (d2), s/veh	0.3	3.0	1.1	5.3	3.2	4.6	3.4	2.6	0.0	1.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.0	1.1	3.8	3.8	3.9	3.5	15.1	0.6	1.8	5.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	46.9	44.3	44.0	45.2	47.1	47.5	20.3	9.4	46.8	13.7	10.2
LnGrp LOS	D	D	D	D	D	D	D	C	A	D	B	B
Approach Vol, veh/h		189			459			2081			1002	
Approach Delay, s/veh		45.3			45.4			23.7			18.5	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	64.1	11.0	15.0	15.7	61.3	7.9	18.1
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	70.0	6.0	16.0	15.0	63.0	6.0	16.0
Max Q Clear Time (g_c+I1), s	6.5	44.0	9.0	8.4	10.3	17.3	3.2	10.9
Green Ext Time (p_c), s	0.1	15.1	0.0	0.4	0.4	6.4	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	5	5	0	0	47	11	1925	92	22	1151	21
Future Vol, veh/h	27	5	5	0	0	47	11	1925	92	22	1151	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	275	-	-	260	-	240
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	28	5	5	0	0	49	11	2005	96	23	1199	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2270	3368	600	-	-	1051	1221	0	0	2101	0	0
Stage 1	1245	1245	-	-	-	-	-	-	-	-	-	-
Stage 2	1025	2123	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	-	-	7.08	4.18	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	-	-	3.39	2.24	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 20	7	427	0	0	212	556	-	-	241	-	-
Stage 1	174	231	-	0	0	-	-	-	-	-	-	-
Stage 2	239	82	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 14	6	427	-	-	212	556	-	-	241	-	-
Mov Cap-2 Maneuver	108	52	-	-	-	-	-	-	-	-	-	-
Stage 1	171	209	-	-	-	-	-	-	-	-	-	-
Stage 2	180	80	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	59.5	27	0.1	0.4
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	556	-	-	103	212	241	-	-
HCM Lane V/C Ratio	0.021	-	-	0.374	0.231	0.095	-	-
HCM Control Delay (s)	11.6	-	-	59.5	27	21.5	-	-
HCM Lane LOS	B	-	-	F	D	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.9	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

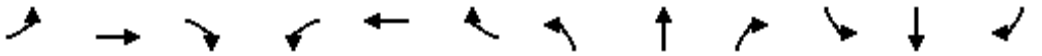
11/10/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	130	319	178	114	146	243	1051	135	281	1743	16
Future Volume (vph)	16	130	319	178	114	146	243	1051	135	281	1743	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3179		3400	3505	1568	3433	3539	1583
Flt Permitted	0.57	1.00	1.00	0.48	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1057	1863	1583	870	3179		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	138	339	189	121	155	259	1118	144	299	1854	17
RTOR Reduction (vph)	0	0	126	0	120	0	0	0	73	0	0	8
Lane Group Flow (vph)	17	138	213	189	156	0	259	1118	71	299	1854	9
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	24.8	22.5	22.5	32.2	26.2		9.0	59.2	59.2	13.9	64.1	64.1
Effective Green, g (s)	26.8	23.5	22.5	34.2	27.2		10.0	60.2	60.2	14.9	65.1	65.1
Actuated g/C Ratio	0.22	0.19	0.19	0.28	0.22		0.08	0.50	0.50	0.12	0.54	0.54
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	252	360	292	294	711		279	1735	776	420	1894	847
v/s Ratio Prot	0.00	0.07		c0.04	0.05		c0.08	0.32		c0.09	c0.52	
v/s Ratio Perm	0.01		0.13	c0.14					0.05			0.01
v/c Ratio	0.07	0.38	0.73	0.64	0.22		0.93	0.64	0.09	0.71	0.98	0.01
Uniform Delay, d1	37.3	42.7	46.7	38.1	38.5		55.4	22.8	16.2	51.3	27.6	13.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.7	8.8	4.8	0.2		35.0	0.8	0.1	5.6	15.8	0.0
Delay (s)	37.4	43.4	55.4	42.8	38.7		90.4	23.6	16.3	56.9	43.3	13.2
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		51.5			40.4			34.3			45.0	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	130	319	178	114	146	243	1051	135	281	1743	16
Future Volume (veh/h)	16	130	319	178	114	146	243	1051	135	281	1743	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	17	138	190	189	121	27	259	1118	85	299	1854	12
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	291	276	220	252	508	110	298	1902	848	390	2009	896
Arrive On Green	0.03	0.15	0.14	0.06	0.18	0.17	0.09	0.54	0.54	0.11	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	1753	2857	621	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	17	138	190	189	73	75	259	1118	85	299	1854	12
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1729	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	0.9	7.8	13.5	7.0	4.1	4.3	8.6	24.6	3.0	9.7	54.5	0.4
Cycle Q Clear(g_c), s	0.9	7.8	13.5	7.0	4.1	4.3	8.6	24.6	3.0	9.7	54.5	0.4
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	291	276	220	252	311	307	298	1902	848	390	2009	896
V/C Ratio(X)	0.06	0.50	0.86	0.75	0.23	0.24	0.87	0.59	0.10	0.77	0.92	0.01
Avail Cap(c_a), veh/h	345	326	262	252	311	307	298	1902	848	481	2072	924
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	45.1	48.4	43.1	40.5	40.8	51.8	17.8	12.9	49.5	22.7	10.9
Incr Delay (d2), s/veh	0.1	1.4	21.8	11.9	0.4	0.4	22.8	0.5	0.1	5.8	7.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.7	6.6	2.7	1.8	1.9	4.5	9.2	1.1	4.4	22.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3	46.5	70.3	54.9	40.9	41.2	74.6	18.3	12.9	55.3	30.1	10.9
LnGrp LOS	D	D	E	D	D	D	E	B	B	E	C	B
Approach Vol, veh/h		345			337			1462			2165	
Approach Delay, s/veh		59.2			48.8			28.0			33.4	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	66.0	11.0	20.9	14.0	69.0	7.5	24.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	15.0	60.0	6.0	19.0	9.0	66.0	6.0	19.0
Max Q Clear Time (g_c+I1), s	11.7	26.6	9.0	15.5	10.6	56.5	2.9	6.3
Green Ext Time (p_c), s	0.3	9.3	0.0	0.5	0.0	7.5	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	34.9
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	5	11	0	0	32	16	1379	49	27	2155	48
Future Vol, veh/h	22	5	11	0	0	32	16	1379	49	27	2155	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	275	-	-	260	-	240
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	23	5	11	0	0	33	17	1436	51	28	2245	50

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3053	3822	1123	-	-	744	2295	0	0	1487	0	0
Stage 1	2301	2301	-	-	-	-	-	-	-	-	-	-
Stage 2	752	1521	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	-	-	6.92	4.16	-	-	4.14	-	-
Critical Hdwy Stg 1	6.56	5.56	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	-	-	3.31	2.23	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 5	~ 4	198	0	0	359	213	-	-	448	-	-
Stage 1	39	71	-	0	0	-	-	-	-	-	-	-
Stage 2	366	178	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 4	~ 3	198	-	-	359	213	-	-	448	-	-
Mov Cap-2 Maneuver	34	55	-	-	-	-	-	-	-	-	-	-
Stage 1	36	67	-	-	-	-	-	-	-	-	-	-
Stage 2	306	164	-	-	-	-	-	-	-	-	-	-

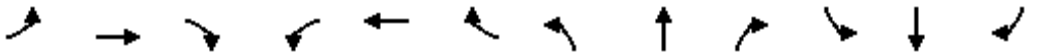
Approach	EB	WB	NB	SB
HCM Control Delay, s	212	16.1	0.3	0.2
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	213	-	-	48	359	448	-	-
HCM Lane V/C Ratio	0.078	-	-	0.825	0.093	0.063	-	-
HCM Control Delay (s)	23.3	-	-	212	16.1	13.6	-	-
HCM Lane LOS	C	-	-	F	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	3.4	0.3	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

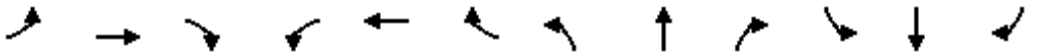


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	255	290	162	402	237	383	1697	121	192	764	195
Future Volume (vph)	133	255	290	162	402	237	383	1697	121	192	764	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3310		3367	3471	1553	3213	3312	1482
Flt Permitted	0.18	1.00	1.00	0.24	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	325	1845	1568	441	3310		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	268	305	171	423	249	403	1786	127	202	804	205
RTOR Reduction (vph)	0	0	168	0	70	0	0	0	50	0	0	110
Lane Group Flow (vph)	140	268	137	171	602	0	403	1786	77	202	804	95
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	27.7	21.7	21.7	29.7	22.7		18.2	64.1	64.1	8.0	53.9	53.9
Effective Green, g (s)	29.7	22.7	21.7	31.7	23.7		19.2	65.1	65.1	9.0	54.9	54.9
Actuated g/C Ratio	0.25	0.19	0.18	0.26	0.20		0.16	0.54	0.54	0.07	0.45	0.45
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	346	281	202	649		535	1870	836	239	1505	673
v/s Ratio Prot	0.05	0.15		c0.06	c0.18		c0.12	c0.51		0.06	0.24	
v/s Ratio Perm	0.16		0.09	0.17					0.05			0.06
v/c Ratio	0.86	0.77	0.49	0.85	0.93		0.75	0.96	0.09	0.85	0.53	0.14
Uniform Delay, d1	40.7	46.6	44.5	39.6	47.7		48.5	26.5	13.5	55.2	23.7	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	10.3	1.3	26.4	19.4		5.9	11.9	0.0	23.0	0.4	0.1
Delay (s)	75.6	57.0	45.9	66.0	67.1		54.5	38.3	13.6	78.2	24.1	19.3
Level of Service	E	E	D	E	E		D	D	B	E	C	B
Approach Delay (s)		55.9			66.9			39.8			32.3	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	255	290	162	402	237	383	1697	121	192	764	195
Future Volume (veh/h)	133	255	290	162	402	237	383	1697	121	192	764	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	140	268	94	171	423	91	403	1786	74	202	804	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	197	313	252	211	512	109	496	1922	857	251	1614	720
Arrive On Green	0.06	0.17	0.16	0.07	0.18	0.17	0.15	0.55	0.55	0.08	0.48	0.48
Sat Flow, veh/h	1767	1856	1572	1767	2890	617	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	140	268	94	171	257	257	403	1786	74	202	804	200
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1745	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	7.0	16.4	6.3	8.0	16.4	16.7	13.4	55.0	2.6	7.1	19.2	9.4
Cycle Q Clear(g_c), s	7.0	16.4	6.3	8.0	16.4	16.7	13.4	55.0	2.6	7.1	19.2	9.4
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	313	252	211	312	309	496	1922	857	251	1614	720
V/C Ratio(X)	0.71	0.86	0.37	0.81	0.82	0.83	0.81	0.93	0.09	0.81	0.50	0.28
Avail Cap(c_a), veh/h	197	333	269	211	331	328	610	1971	879	251	1614	720
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	47.3	43.9	41.5	46.4	46.7	48.5	24.3	12.5	53.2	20.8	18.2
Incr Delay (d2), s/veh	11.1	18.6	0.9	20.8	14.6	15.9	6.8	8.3	0.0	17.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	9.1	2.5	2.3	8.4	8.5	6.0	22.5	0.9	3.4	7.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	65.9	44.9	62.4	61.0	62.6	55.3	32.6	12.5	70.4	21.0	18.4
LnGrp LOS	D	E	D	E	E	E	E	C	B	E	C	B
Approach Vol, veh/h		502			685			2263			1206	
Approach Delay, s/veh		58.0			62.0			36.0			28.8	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	68.4	12.0	23.7	21.1	60.3	11.0	24.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	65.0	7.0	20.0	20.0	53.0	6.0	21.0
Max Q Clear Time (g_c+I1), s	9.1	57.0	10.0	18.4	15.4	21.2	9.0	18.7
Green Ext Time (p_c), s	0.0	6.3	0.0	0.3	0.6	6.6	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	40.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	37	0	0	135	0	2030	104	0	1206	30
Future Vol, veh/h	0	0	37	0	0	135	0	2030	104	0	1206	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	0	0	39	0	0	141	0	2115	108	0	1256	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	628	-	-	1112	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.08	-	-	7.08	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.39	-	-	3.39	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	409	0	0	192	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	409	-	-	192	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	62.6	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	409	192	-	-
HCM Lane V/C Ratio	-	-	0.094	0.732	-	-
HCM Control Delay (s)	-	-	14.7	62.6	-	-
HCM Lane LOS	-	-	B	F	-	-
HCM 95th %tile Q(veh)	-	-	0.3	4.7	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	121	50	18	52	77
Future Vol, veh/h	27	121	50	18	52	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	40	178	74	26	76	113

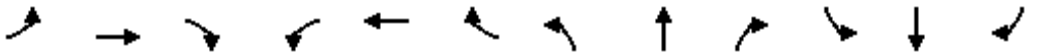
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	100	0	-	0	345	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1499	-	-	-	656	977
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1499	-	-	-	636	977
Mov Cap-2 Maneuver	-	-	-	-	636	-
Stage 1	-	-	-	-	913	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1499	-	-	-	803
HCM Lane V/C Ratio	0.026	-	-	-	0.236
HCM Control Delay (s)	7.5	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

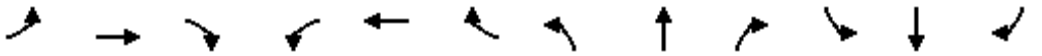


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	177	346	192	155	154	285	1107	143	423	1755	46
Future Volume (vph)	46	177	346	192	155	154	285	1107	143	423	1755	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3212		3400	3505	1568	3433	3539	1583
Flt Permitted	0.45	1.00	1.00	0.36	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	831	1863	1583	655	3212		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	188	368	204	165	164	303	1178	152	450	1867	49
RTOR Reduction (vph)	0	0	138	0	132	0	0	0	84	0	0	23
Lane Group Flow (vph)	49	188	230	204	197	0	303	1178	68	450	1867	26
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.7	20.2	20.2	31.7	22.7		10.0	54.2	54.2	19.9	64.1	64.1
Effective Green, g (s)	28.7	21.2	20.2	33.7	23.7		11.0	55.2	55.2	20.9	65.1	65.1
Actuated g/C Ratio	0.23	0.17	0.16	0.27	0.19		0.09	0.45	0.45	0.17	0.53	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	250	320	259	266	617		303	1569	701	581	1868	835
v/s Ratio Prot	0.01	0.10		c0.06	0.06		c0.09	0.34		0.13	c0.53	
v/s Ratio Perm	0.03		0.15	c0.15					0.04			0.02
v/c Ratio	0.20	0.59	0.89	0.77	0.32		1.00	0.75	0.10	0.77	1.00	0.03
Uniform Delay, d1	37.4	47.0	50.4	39.0	42.9		56.1	28.3	19.7	48.9	29.1	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.7	28.5	12.4	0.3		51.7	2.1	0.1	6.4	20.5	0.0
Delay (s)	37.8	49.8	78.9	51.4	43.2		107.9	30.4	19.7	55.3	49.6	14.0
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		66.5			46.3			43.8			50.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	177	346	192	155	154	285	1107	143	423	1755	46
Future Volume (veh/h)	46	177	346	192	155	154	285	1107	143	423	1755	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	49	188	219	204	165	36	303	1178	93	450	1867	44
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	305	281	225	259	530	113	315	1677	748	544	1923	858
Arrive On Green	0.05	0.15	0.14	0.08	0.18	0.18	0.09	0.48	0.48	0.16	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1753	2868	611	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	49	188	219	204	99	102	303	1178	93	450	1867	44
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1731	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	2.7	11.4	16.5	10.0	5.9	6.1	10.6	31.5	4.0	15.1	60.9	1.6
Cycle Q Clear(g_c), s	2.7	11.4	16.5	10.0	5.9	6.1	10.6	31.5	4.0	15.1	60.9	1.6
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	281	225	259	323	320	315	1677	748	544	1923	858
V/C Ratio(X)	0.16	0.67	0.97	0.79	0.31	0.32	0.96	0.70	0.12	0.83	0.97	0.05
Avail Cap(c_a), veh/h	367	281	225	259	323	320	315	1677	748	663	1927	859
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	48.1	51.2	41.2	42.2	42.5	54.2	24.8	17.5	48.9	26.6	13.0
Incr Delay (d2), s/veh	0.2	6.0	52.6	14.7	0.5	0.6	40.8	1.3	0.1	7.2	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.7	9.7	2.2	2.6	2.7	6.2	12.6	1.4	6.9	26.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	54.1	103.8	55.9	42.7	43.0	95.0	26.1	17.6	56.1	40.8	13.0
LnGrp LOS	D	D	F	E	D	D	F	C	B	E	D	B
Approach Vol, veh/h		456			405			1574			2361	
Approach Delay, s/veh		76.5			49.4			38.9			43.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.9	61.0	14.0	22.0	15.0	68.9	9.8	26.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	22.0	52.0	9.0	17.0	10.0	64.0	9.0	17.0
Max Q Clear Time (g_c+I1), s	17.1	33.5	12.0	18.5	12.6	62.9	4.7	8.1
Green Ext Time (p_c), s	0.7	8.0	0.0	0.0	0.0	1.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	42	0	0	81	0	1451	72	0	2229	60
Future Vol, veh/h	0	0	42	0	0	81	0	1451	72	0	2229	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	0	0	44	0	0	84	0	1511	75	0	2322	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1161	-	-	793	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.96	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.33	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	187	0	0	334	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	187	-	-	334	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	19.4	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	187	334	-	-
HCM Lane V/C Ratio	-	-	0.234	0.253	-	-
HCM Control Delay (s)	-	-	30	19.4	-	-
HCM Lane LOS	-	-	D	C	-	-
HCM 95th %tile Q(veh)	-	-	0.9	1	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	85	59	43	54	34	48
Future Vol, veh/h	85	59	43	54	34	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	123	86	62	78	49	70

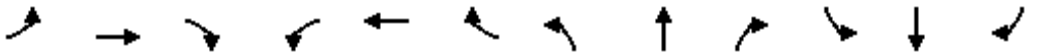
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	140	0	-	0	433	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1443	-	-	-	584	960
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	731	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1443	-	-	-	532	960
Mov Cap-2 Maneuver	-	-	-	-	532	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	731	-

Approach	EB	WB	SB
HCM Control Delay, s	4.6	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1443	-	-	-	720
HCM Lane V/C Ratio	0.085	-	-	-	0.165
HCM Control Delay (s)	7.7	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

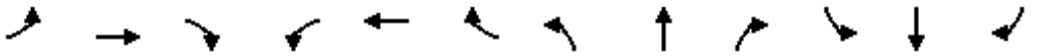


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	255	290	165	403	239	383	1707	121	196	764	195
Future Volume (vph)	133	255	290	165	403	239	383	1707	121	196	764	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3309		3367	3471	1553	3213	3312	1482
Flt Permitted	0.18	1.00	1.00	0.22	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	337	1845	1568	413	3309		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	268	305	174	424	252	403	1797	127	206	804	205
RTOR Reduction (vph)	0	0	168	0	71	0	0	0	50	0	0	109
Lane Group Flow (vph)	140	268	137	174	605	0	403	1797	77	206	804	96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.9	20.9	20.9	28.9	21.9		18.2	64.7	64.7	8.0	54.5	54.5
Effective Green, g (s)	28.9	21.9	20.9	30.9	22.9		19.2	65.7	65.7	9.0	55.5	55.5
Actuated g/C Ratio	0.24	0.18	0.17	0.26	0.19		0.16	0.54	0.54	0.07	0.46	0.46
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	335	271	194	628		536	1890	846	239	1524	682
v/s Ratio Prot	0.05	0.15		c0.06	c0.18		c0.12	c0.52		0.06	0.24	
v/s Ratio Perm	0.16		0.09	0.17					0.05			0.06
v/c Ratio	0.86	0.80	0.51	0.90	0.96		0.75	0.95	0.09	0.86	0.53	0.14
Uniform Delay, d1	41.1	47.3	45.2	40.5	48.4		48.4	25.9	13.2	55.2	23.2	18.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	12.8	1.5	37.0	26.8		5.9	11.2	0.0	25.8	0.3	0.1
Delay (s)	76.0	60.0	46.7	77.5	75.2		54.3	37.2	13.2	81.0	23.5	18.9
Level of Service	E	E	D	E	E		D	D	B	F	C	B
Approach Delay (s)		57.5			75.7			38.8			32.5	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	255	290	165	403	239	383	1707	121	196	764	195
Future Volume (veh/h)	133	255	290	165	403	239	383	1707	121	196	764	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	140	268	94	174	424	94	403	1797	74	206	804	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	193	309	249	207	504	111	495	1936	863	249	1625	725
Arrive On Green	0.06	0.17	0.16	0.07	0.18	0.17	0.15	0.55	0.55	0.08	0.48	0.48
Sat Flow, veh/h	1767	1856	1572	1767	2873	632	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	140	268	94	174	259	259	403	1797	74	206	804	200
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1742	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	7.0	16.6	6.3	8.0	16.7	17.0	13.5	55.7	2.6	7.3	19.2	9.4
Cycle Q Clear(g_c), s	7.0	16.6	6.3	8.0	16.7	17.0	13.5	55.7	2.6	7.3	19.2	9.4
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	193	309	249	207	309	305	495	1936	863	249	1625	725
V/C Ratio(X)	0.73	0.87	0.38	0.84	0.84	0.85	0.81	0.93	0.09	0.83	0.49	0.28
Avail Cap(c_a), veh/h	193	315	253	207	314	310	605	1987	886	249	1625	725
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	47.9	44.4	42.4	47.0	47.3	48.9	24.2	12.3	53.7	20.6	18.1
Incr Delay (d2), s/veh	12.7	21.3	0.9	25.2	17.6	19.2	7.0	8.2	0.0	20.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	9.4	0.1	2.7	8.8	8.9	6.1	22.6	0.9	3.6	7.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	69.2	45.4	67.6	64.6	66.5	55.9	32.4	12.4	73.8	20.9	18.3
LnGrp LOS	D	E	D	E	E	E	E	C	B	E	C	B
Approach Vol, veh/h		502			692			2274			1210	
Approach Delay, s/veh		60.5			66.1			35.9			29.4	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	69.3	12.0	23.7	21.2	61.1	11.0	24.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	66.0	7.0	19.0	20.0	54.0	6.0	20.0
Max Q Clear Time (g_c+I1), s	9.3	57.7	10.0	18.6	15.5	21.2	9.0	19.0
Green Ext Time (p_c), s	0.0	6.6	0.0	0.1	0.6	6.6	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	41.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	37	0	0	145	0	2030	105	0	1206	30
Future Vol, veh/h	0	0	37	0	0	145	0	2030	105	0	1206	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	0	0	39	0	0	151	0	2115	109	0	1256	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	628	-	-	1112	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.08	-	-	7.08	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.39	-	-	3.39	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	409	0	0	192	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	409	-	-	192	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	70.3	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	409	192	-	-
HCM Lane V/C Ratio	-	-	0.094	0.787	-	-
HCM Control Delay (s)	-	-	14.7	70.3	-	-
HCM Lane LOS	-	-	B	F	-	-
HCM 95th %tile Q(veh)	-	-	0.3	5.4	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	125	61	19	54	80
Future Vol, veh/h	28	125	61	19	54	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	41	184	90	28	79	118

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	118	0	-	0	370	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1476	-	-	-	634	956
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1476	-	-	-	614	956
Mov Cap-2 Maneuver	-	-	-	-	614	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1476	-	-	-	781
HCM Lane V/C Ratio	0.028	-	-	-	0.252
HCM Control Delay (s)	7.5	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	175	69	2	6	11
Future Vol, veh/h	4	175	69	2	6	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	6	257	101	3	9	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	104	0	-	0	372	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	269	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1494	-	-	-	633	957
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	781	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1494	-	-	-	630	957
Mov Cap-2 Maneuver	-	-	-	-	630	-
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	781	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1494	-	-	-	809
HCM Lane V/C Ratio	0.004	-	-	-	0.031
HCM Control Delay (s)	7.4	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	181	71	0
Future Vol, veh/h	2	0	0	181	71	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	1	1	8	8
Mvmt Flow	3	0	0	266	104	0

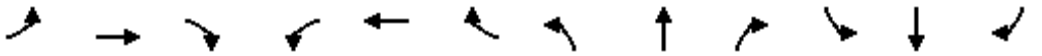
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	370	104	104	0	-	0
Stage 1	104	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	630	951	1494	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	630	951	1494	-	-	-
Mov Cap-2 Maneuver	630	-	-	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	779	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	630	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	10.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

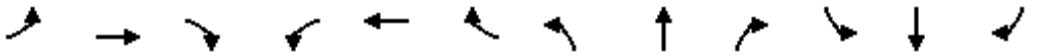


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	178	346	193	156	155	285	1114	143	429	1755	46
Future Volume (vph)	46	178	346	193	156	155	285	1114	143	429	1755	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3212		3400	3505	1568	3433	3539	1583
Flt Permitted	0.44	1.00	1.00	0.36	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	826	1863	1583	651	3212		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	189	368	205	166	165	303	1185	152	456	1867	49
RTOR Reduction (vph)	0	0	138	0	133	0	0	0	84	0	0	23
Lane Group Flow (vph)	49	189	230	205	198	0	303	1185	68	456	1867	26
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.7	20.2	20.2	31.7	22.7		10.0	54.1	54.1	20.0	64.1	64.1
Effective Green, g (s)	28.7	21.2	20.2	33.7	23.7		11.0	55.1	55.1	21.0	65.1	65.1
Actuated g/C Ratio	0.23	0.17	0.16	0.27	0.19		0.09	0.45	0.45	0.17	0.53	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	249	320	259	265	617		303	1566	700	584	1868	835
v/s Ratio Prot	0.01	0.10		c0.06	0.06		c0.09	0.34		0.13	c0.53	
v/s Ratio Perm	0.03		0.15	c0.15					0.04			0.02
v/c Ratio	0.20	0.59	0.89	0.77	0.32		1.00	0.76	0.10	0.78	1.00	0.03
Uniform Delay, d1	37.4	47.1	50.4	39.1	42.9		56.1	28.5	19.7	48.9	29.1	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.9	28.5	13.1	0.3		51.7	2.1	0.1	6.7	20.5	0.0
Delay (s)	37.8	50.0	78.9	52.2	43.2		107.9	30.6	19.8	55.7	49.6	14.0
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		66.6			46.6			43.9			50.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	178	346	193	156	155	285	1114	143	429	1755	46
Future Volume (veh/h)	46	178	346	193	156	155	285	1114	143	429	1755	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	49	189	219	205	166	37	303	1185	93	456	1867	44
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	304	281	225	259	528	115	315	1671	745	549	1923	858
Arrive On Green	0.05	0.15	0.14	0.08	0.18	0.18	0.09	0.47	0.47	0.16	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1753	2856	622	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	49	189	219	205	100	103	303	1185	93	456	1867	44
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1729	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	2.7	11.5	16.5	10.0	5.9	6.2	10.6	31.9	4.0	15.3	60.9	1.6
Cycle Q Clear(g_c), s	2.7	11.5	16.5	10.0	5.9	6.2	10.6	31.9	4.0	15.3	60.9	1.6
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	304	281	225	259	323	320	315	1671	745	549	1923	858
V/C Ratio(X)	0.16	0.67	0.97	0.79	0.31	0.32	0.96	0.71	0.12	0.83	0.97	0.05
Avail Cap(c_a), veh/h	366	281	225	259	323	320	315	1671	745	663	1927	859
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	48.2	51.2	41.3	42.2	42.5	54.2	25.0	17.6	48.8	26.6	13.0
Incr Delay (d2), s/veh	0.2	6.2	52.6	15.3	0.5	0.6	40.8	1.4	0.1	7.4	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.8	9.7	2.3	2.6	2.7	6.2	12.8	1.4	7.0	26.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	54.3	103.8	56.6	42.8	43.1	95.0	26.4	17.7	56.3	40.8	13.0
LnGrp LOS	D	D	F	E	D	D	F	C	B	E	D	B
Approach Vol, veh/h		457			408			1581			2367	
Approach Delay, s/veh		76.5			49.8			39.0			43.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.1	60.8	14.0	22.0	15.0	68.9	9.8	26.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	22.0	52.0	9.0	17.0	10.0	64.0	9.0	17.0
Max Q Clear Time (g_c+I1), s	17.3	33.9	12.0	18.5	12.6	62.9	4.7	8.2
Green Ext Time (p_c), s	0.7	7.9	0.0	0.0	0.0	1.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	45.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	42	0	0	88	0	1451	74	0	2229	60
Future Vol, veh/h	0	0	42	0	0	88	0	1451	74	0	2229	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	0	0	44	0	0	92	0	1511	77	0	2322	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1161	-	-	794	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.96	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.33	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	187	0	0	333	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	187	-	-	333	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	19.9	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	187	333	-	-
HCM Lane V/C Ratio	-	-	0.234	0.275	-	-
HCM Control Delay (s)	-	-	30	19.9	-	-
HCM Lane LOS	-	-	D	C	-	-
HCM 95th %tile Q(veh)	-	-	0.9	1.1	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	87	66	50	55	35	50
Future Vol, veh/h	87	66	50	55	35	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	126	96	72	80	51	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	460	112
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1429	-	-	-	563	947
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1429	-	-	-	511	947
Mov Cap-2 Maneuver	-	-	-	-	511	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	SB
HCM Control Delay, s	4.4	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	701
HCM Lane V/C Ratio	0.088	-	-	-	0.176
HCM Control Delay (s)	7.8	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	94	98	5	4	7
Future Vol, veh/h	7	94	98	5	4	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	10	136	142	7	6	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	149	0	-	0	302	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1432	-	-	-	694	906
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	877	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1432	-	-	-	688	906
Mov Cap-2 Maneuver	-	-	-	-	688	-
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	877	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1432	-	-	-	812
HCM Lane V/C Ratio	0.007	-	-	-	0.02
HCM Control Delay (s)	7.5	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	98	103	1
Future Vol, veh/h	1	0	0	98	103	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	1	1	8	8
Mvmt Flow	1	0	0	144	151	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	296	152	152	0	-	0
Stage 1	152	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	695	894	1435	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	883	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	695	894	1435	-	-	-
Mov Cap-2 Maneuver	695	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1435	-	695	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

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P 503.643.8286 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

Design Modification Request to Locate Utilities Inside the Right-of-Way at Significant Natural Resource Crossings – Section 125.A.

LU 2021-023 SUB Cedar Creek Garden Completeness Review – January 13th, 2022

To: Bob Galati, P.E. – City Engineer
Through: Craig Christensen, P.E. – City Project Manager
From: Brent Fitch, P.E. – Principal
PDG Project Number: 285-021

Location of Requested Design Modification

SW Brookman Road, a County arterial street, is located along the southern boundary of the site. Proposed Street "A" provides access from SW Brookman Road, further intersecting with Proposed Street "B", which in turn serves proposed Lots 9 – 39 before terminating as a street stub at the eastern shared boundary with Tax Lot Crossings – 105 (Exhibit A – Sheet P.3.0., Preliminary Plat). Street "B" crosses an unnamed tributary of Cedar Creek approximately 112 feet west of the proposed terminus.

Current Standards

Section 210.6.E.1. of the City of Sherwood Engineering Manual states "The minimum public utility easements for residential subdivisions shall be an 8 foot wide PUE along all front lot lines, as shown on the local street section standards in the TSP."

Design Modification Being Requested

We are requesting that utilities on both sides of Street "B" be located within the right-of-way where it adjoins Open Space Tracts B and D, allowing the elimination of the 8 foot wide PUE at these locations.

Existing Conditions

The site includes a number of restricting topographic features, including the Cedar Creek channel and the associated broad floodplain flowing through the site, from the west central site boundary to the northeast site boundary. Two unnamed intermittent tributaries to Cedar Creek have shallower topographic relief and enter the site near the southwest and southeast site corners, providing a narrow corridor to access the site between the two, and sloping down within relatively broad, flat topography to the north at about 2% before reaching the Cedar Creek floodplain elevation. Between the tributaries is a higher ridge of forested area that also slopes down from the southern site boundary to the north at about 5% (Exhibit B – Fig. 3, Existing Conditions Map).

Result of Meeting Standards

Requiring 8-foot-wide utility easements across Tracts B (approximately 133 feet long) and D (approximately 188 feet long) where they adjoin Street "B" would result in approximately 2,592 square feet (1,072 square feet and 1520 square feet, respectively) of avoidable impacts to onsite significant natural resource areas.

Proposed Design Modification

Modification of the Local Street Section requesting that utilities on both sides of Street "B" be located under sidewalks within the right-of-way where it adjoins Open Space Tracts B and D, allowing the elimination of the 8-foot-wide PUE at these locations.

Reason Why Design Request Should be Approved

In consideration of the significant natural resources and 100-year flood plain on site, the modification represents the elimination of over 2,500 square feet of resource impacts by limiting the width of required public improvements to within the right-of-way where no residential lots abut the street.

Brent Fitch, P.E. – Principal — Date: 1.13.2022

Craig Christensen, P.E. – City Project Manager — Date

- ❑ Approved
- ❑ Approved with Conditions (conditions below or on attached sheet)
- ❑ Denied

Bob Galati, P.E. - City Engineer — Date

Exhibit A – Sheet P.3.0., Preliminary Plat
Exhibit B – Fig. 3, Existing Conditions Map

Exhibit A – Fig. 3., Existing Conditions Plan

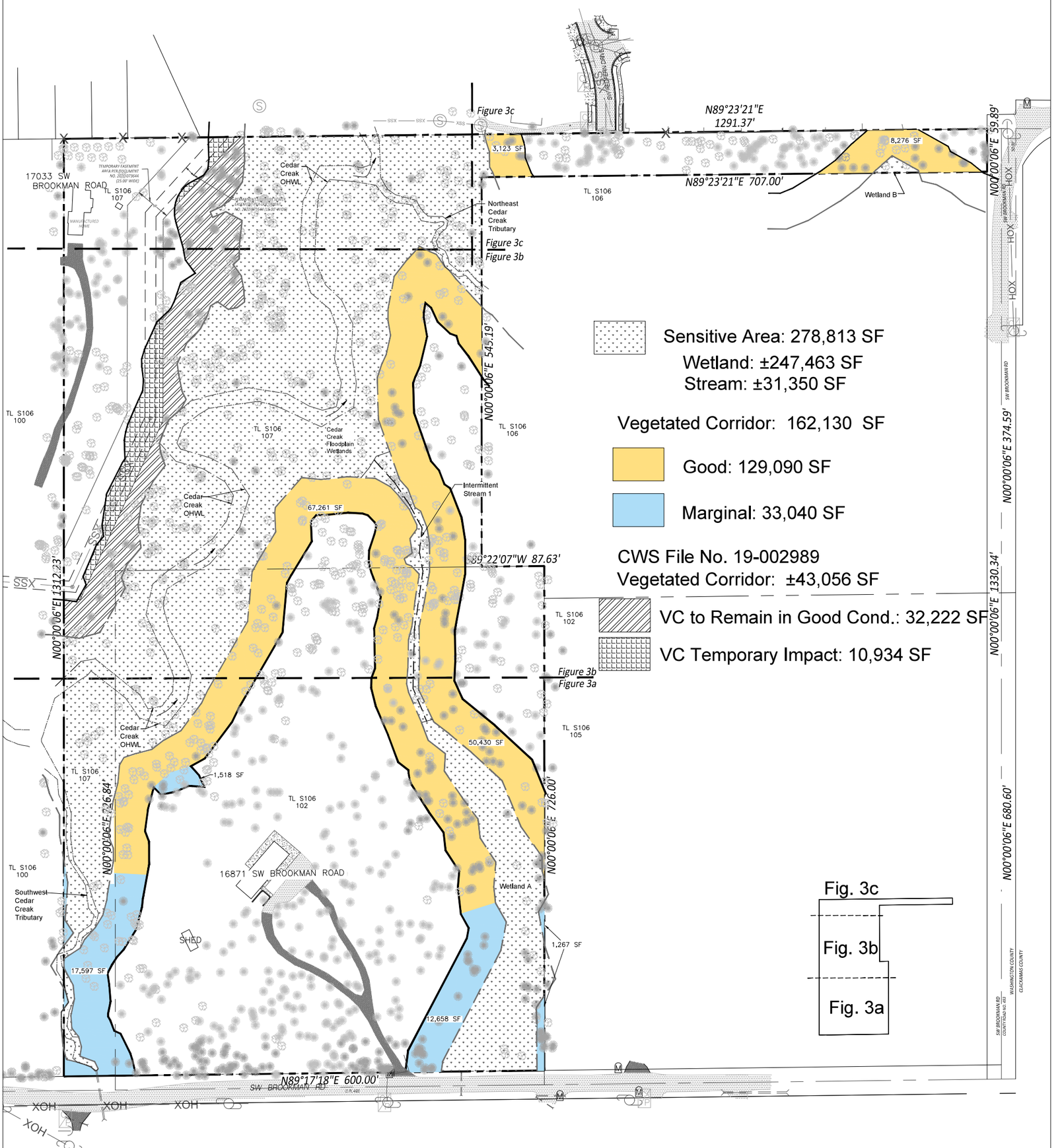


Fig. 3

Rev: 00/00
Job: 21004
Date: 10/21
Mod. By: KR

Base Map Source: Pioneer Design Group, Inc.

Existing Conditions Map
Cedar Creek Gardens
Sherwood, Oregon

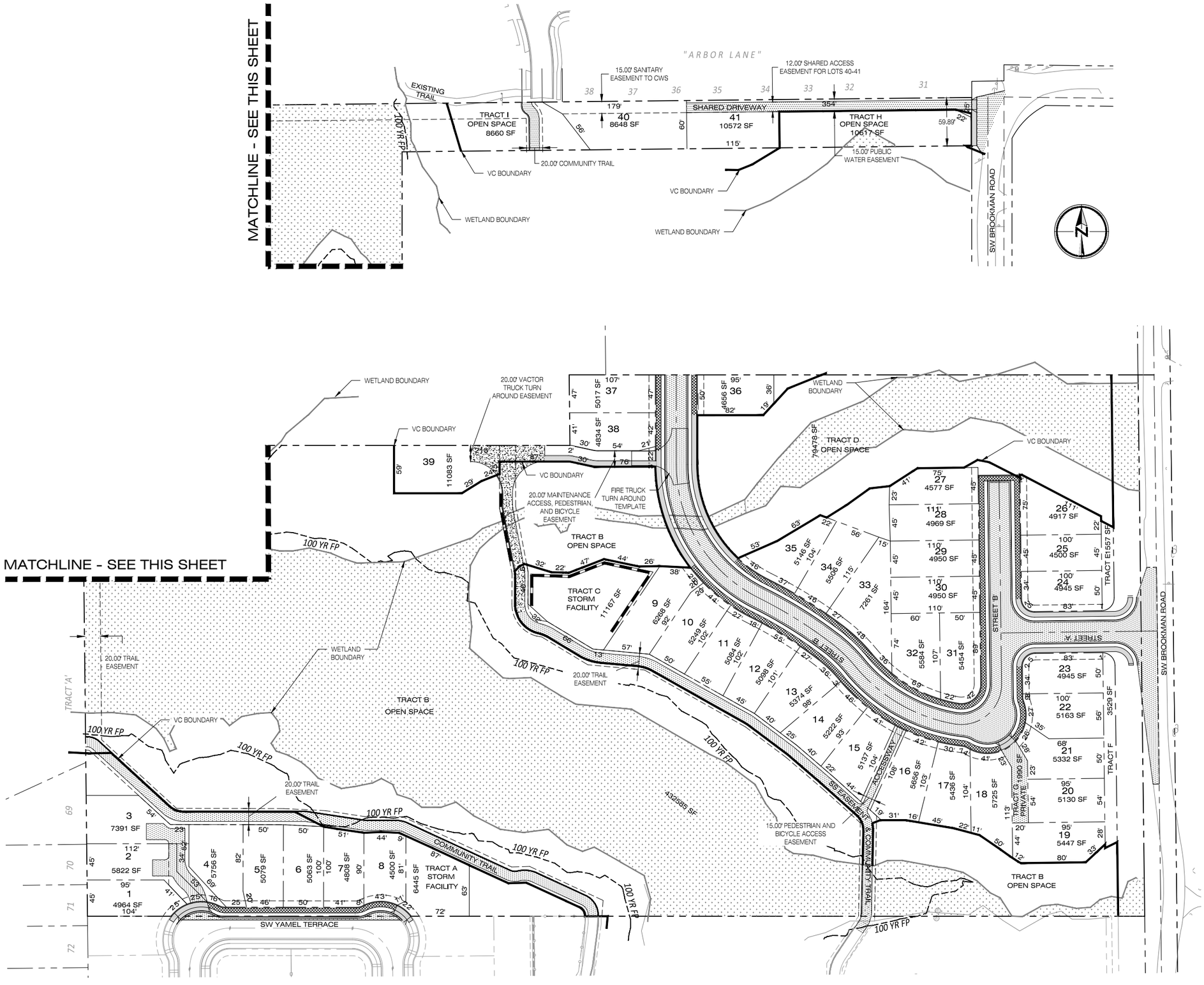
Environmental Science & Assessment, LLC

4831 NE Fremont St.
Suite 2B
Portland, OR 97213
Phone: 503.478.0424
www.esapdx.com

Exhibit A25

Exhibit B – Sheet P3.0, Preliminary Plat

Exhibit A25



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PORTLAND, OREGON | HONOLULU, HAWAII
PH: 503.643.8286 PH: 808.753.2276
WWW.PD-GRP.COM

PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P3.0plat.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.0

PIONEER DESIGN GROUP, INC.
CIVIL LAND USE PLANNING SURVEY
P 503.643.8286 F 844.715.4743 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

January 13, 2022

Mr. Stacy Shetler, P.E.
County Engineer
Washington County
Department of Land Use and Transportation
1400 SW Walnut St., Ste 212, MS 17A
Hillsboro, Oregon 97123

RE: **Cedar Creek Gardens – 41-Lot Subdivision – TIA Study Intersection 4**
Design Exception Request for Local Street Access to a County Arterial Road.

WASHINGTON COUNTY ROAD DESIGN AND CONSTRUCTION STANDARDS
REQUEST FOR EXCEPTION

The following is a request for exception as per Section 501.8.5.B.4 of the Washington County Community Development Code Standards.

Reason: Local Street access to SW Brookman Road, a County arterial street, is proposed. The subject development is a 41-Lot subdivision of Tax Lots 102 & 107, Tax Map 3S1 06, located within the Brookman Road Concept Plan area of the City of Sherwood (the City) (see Exhibit A - Location Map, attached). As a result of the location of Cedar Creek, along with several unnamed tributaries flowing through the site, the site is divided into 3 distinct and isolated developable areas (see Exhibit B – Fig. 4, Site Plan, and Exhibit C – Sheet P3.0, Preliminary Plat, attached). Of the 3 developable areas, the northwest portion of the site will support 8 lots, all of which will be accessed from the west via local public streets within the proposed Reserve at Cedar Creek Subdivision (under construction, no Design Exception Request required); 2 of the proposed lots will access SW Brookman Road to the north east via a shared driveway (see *Cedar Creek Gardens – 42-Lot Subdivision – TIA Study Intersection 5*, submitted concurrently); and 31 of the lots will obtain access to SW Brookman Road to the south via a new interior local public street system, which is the subject of this request. In addition to the 31-lots described, the proposed local street will stub to Tax Lots 105 and 106, consolidating access for up to 19 future lots once that area is annexed into the City boundaries.

As a result of the location of the existing Cedar Creek alignment, wetlands, vegetated corridor, and 100-year floodplain, the southern portion of the site has no street frontage or alternative access other than that which is proposed to SW Brookman Road. Adding a

collector or arterial street is impracticable for this limited internal street system, and as such a local street connection is being proposed.

Comparison: The existing standard states that "*Direct access to arterial roads shall be from collector or other arterial streets. Exceptions for local streets and private accesses may be allowed through a Type II process when collector access is found to be unavailable and impracticable by the Director.*" As described above, it is proposed to access SW Brookman Road, a County arterial street, with a new local street. Despite the site being located within the incorporated area of the City of Sherwood, SW Brookman Road remains under Washington County (the County) jurisdiction, and therefore this design exception is being requested from the County as part of preparing a complete Type III land use application process for submittal to the City.

It is noted that during the development of the Brookman Addition Concept Plan and the Washington County Transportation System Plan (TSP), the ultimate location of a proposed Southern Arterial was not known. The coordination of the two processes resulted in the recommendation of the Brookman Addition Concept Plan that the existing intersection of Brookman Road and Highway 99W be realigned to the north to avoid conflicts with a potential Southern Arterial alignment further south. The intersection design has been further refined through the 2020 Addendum to the Brookman Addition Concept Plan. Previous land use approvals to the west of the site along SW Brookman Road ("Middlebrook Subdivision", "Riverside at Cedar Creek", and "The Reserve at Cedar Creek") have been conditioned to pay a proportionate share fee-in-lieu of construction payment to ODOT for improvements to the intersection of Brookman Road and Highway 99W, including signalization, and this development is anticipated to be similarly conditioned.

The Brookman Addition Concept Plan indicated that Brookman Road would serve as a Collector roadway, to provide access to future development within the area. No identified location for the Southern Arterial has been established since the adoption of the Brookman Addition Concept Plan, therefore, under the County TSP this area remains as a refinement area (see Exhibit D – Functional Classification, Urban Area Map 6 of 6, attached). In the interim, the County TSP anticipates these residential access requests, noting that *……while refinement planning has not yet been completed, access spacing and other requirements will need to be evaluated on a case-by-case basis at the time of any development application*.

Documentation: The proposed connection to SW Brookman Road is identified in the City of Sherwood Transportation System Plan as a Conceptual Street Connection (See Exhibit E – Figure 18, Local Street Connectivity, attached).

The Significant Natural Resource areas demonstrated within Exhibit B also identify that the proposed site plan minimizes the incursion into the existing VC and wetlands, and that no other practicable alternative development patterns exist to avoid further disturbance.

A Traffic Impact Analysis (T.I.A) (see Exhibit F - Cedar Creek Gardens Subdivision Transportation Impact Analysis, attached) was completed by Lancaster Mobley analyzing the proposed intersection, which is noted as intersection "4". As described in the T.I.A., *All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek* [Gardens] *Subdivision.*

Public Safety: The proposed access location meets the Washington County Access spacing standards along an arterial street between the 90-degree corner of the existing alignment of SW Brookman Road to the east, and to the public cul-de-sac approved as part of the "Reserve at Cedar Creek" development to the west (see Exhibit G – Sheet P7.0, Future Conceptual Connectivity Plan, attached). The proposed intersection will meet the requirements of the Washington County Road Design and Construction Standards, including payment of funds into a Trust and Agency account in-lieu of construction, and has been designed with appropriate alignment and grading easements to permit completion of the future frontage improvements of SW Brookman Road at ultimate alignment. The design exception will not decrease the public safety of the intersection.

Performance: The design exception is anticipated to have minimal to no effect on the operation and functionality of SW Brookman Road and the intersection with the new public street. As described in the T.I.A., no significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.

The T.I.A also found that adequate sight distance is available. As described in the T.I.A., *At the main site access on SW Brookman Road, the posted speed is 35 mph, but it transitions to 25 mph just east of the*

access. For the sight distance assessment, the speed of approaching vehicles was assumed to be 40 mph, which is 5 mph over the posted speed. At 40 mph, the recommended ISD is 445 feet and the required ISD is 305 feet.

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 445 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

All study intersections are projected within the T.I.A. to operate acceptably per their respective jurisdictional standards by year 2024 with buildout of the proposed subdivision, with no operational mitigation necessary.

Exhibits:

Exhibit A – Location Map
Exhibit B – Fig. 4, Site Plan
Exhibit C – Sheet P3.0, Preliminary Plat
Exhibit D – Functional Classification, Urban Area Map 6 of 6
Exhibit E – Figure 18, Local Street Connectivity
Exhibit F – Cedar Creek Gardens Subdivision Transportation Impact Analysis
Exhibit G – Sheet P7.0, Future Conceptual Connectivity Plan

Sincerely,
Pioneer Design Group, Inc.

Brent Fitch, P.E.
Principal

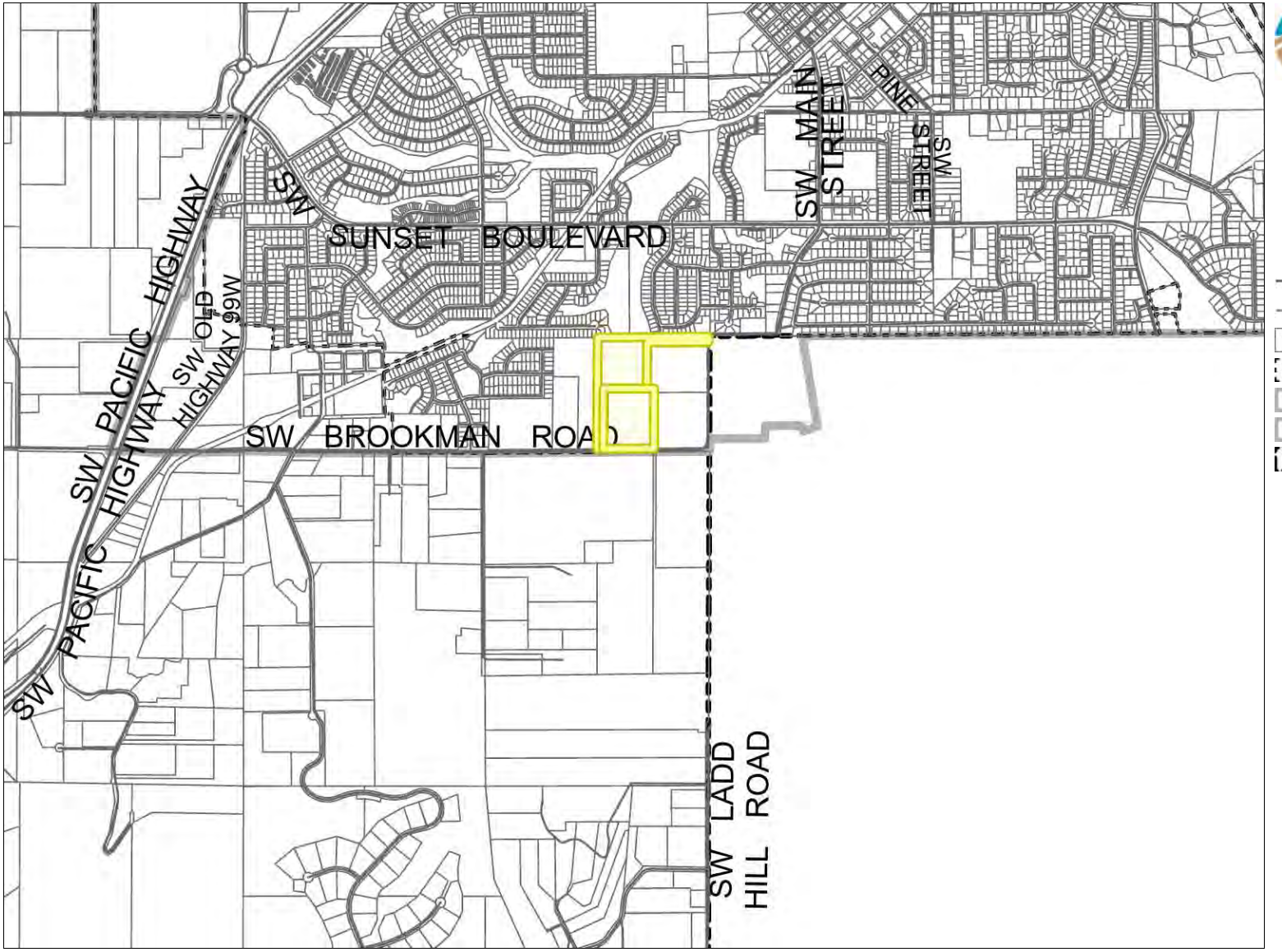
PIONEER DESIGN GROUP, INC.
CIVIL LAND USE PLANNING SURVEY
P 503.643.8286 F 844.715.4743 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

Exhibit A – Location Map

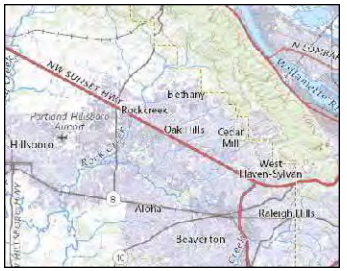
Exhibit A26

WASHINGTON COUNTY
OREGON

Map Title



Street Names
Arterials
All Streets
Parcels
City Limits
Regional Urban Growth Boundary
Non-Regional Urban Growth Boundaries
Washington County Boundary



1: 31,680

1 inch = 2,640 feet

0 660 2,640 5,280 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

Notes

1/5/2022

www.co.washington.or.us

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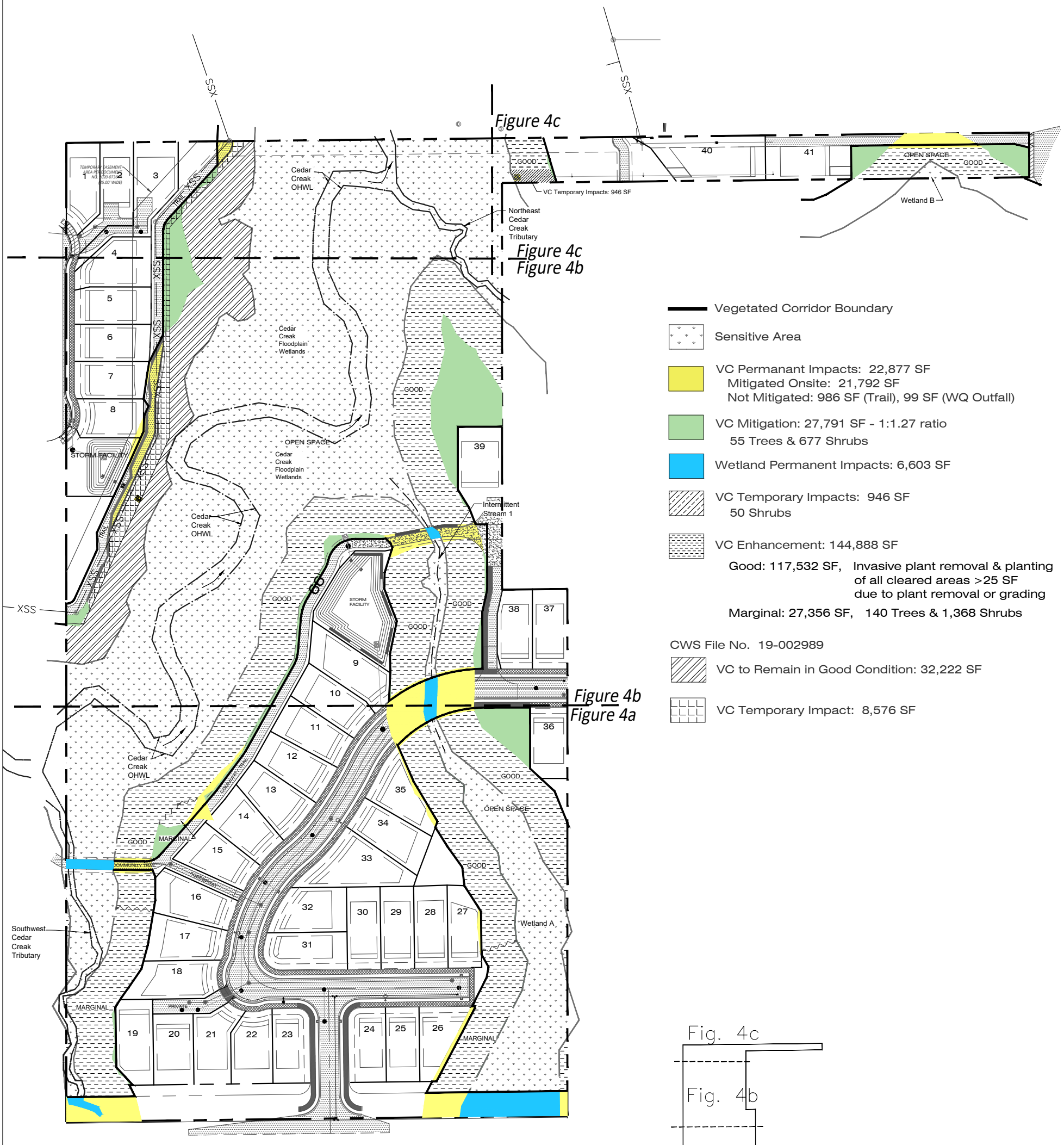
P 503.643.8286 F 844.715.4743 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

Exhibit B – Fig. 4, Site Plan



Vegetated Corridor Boundary

Sensitive Area

VC Permanant Impacts: 22,877 SF
Mitigated Onsite: 21,792 SF
Not Mitigated: 986 SF (Trail), 99 SF (WQ Outfall)

VC Mitigation: 27,791 SF - 1:1.27 ratio
55 Trees & 677 Shrubs

Wetland Permanent Impacts: 6,603 SF

VC Temporary Impacts: 946 SF
50 Shrubs

VC Enhancement: 144,888 SF

Good: 117,532 SF, Invasive plant removal & planting of all cleared areas >25 SF due to plant removal or grading

Marginal: 27,356 SF, 140 Trees & 1,368 Shrubs

CWS File No. 19-002989

VC to Remain in Good Condition: 32,222 SF

VC Temporary Impact: 8,576 SF

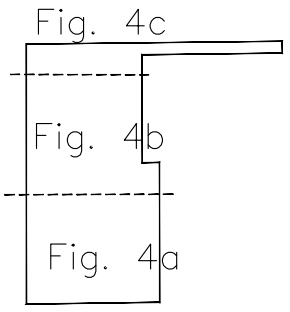


Fig. 4

Rev: 4/22
Job: 21004
Date: 10/21
Mod. By: KR

Base Map Source: Pioneer Design Group, Inc.

N
1"=140'
0 75 140

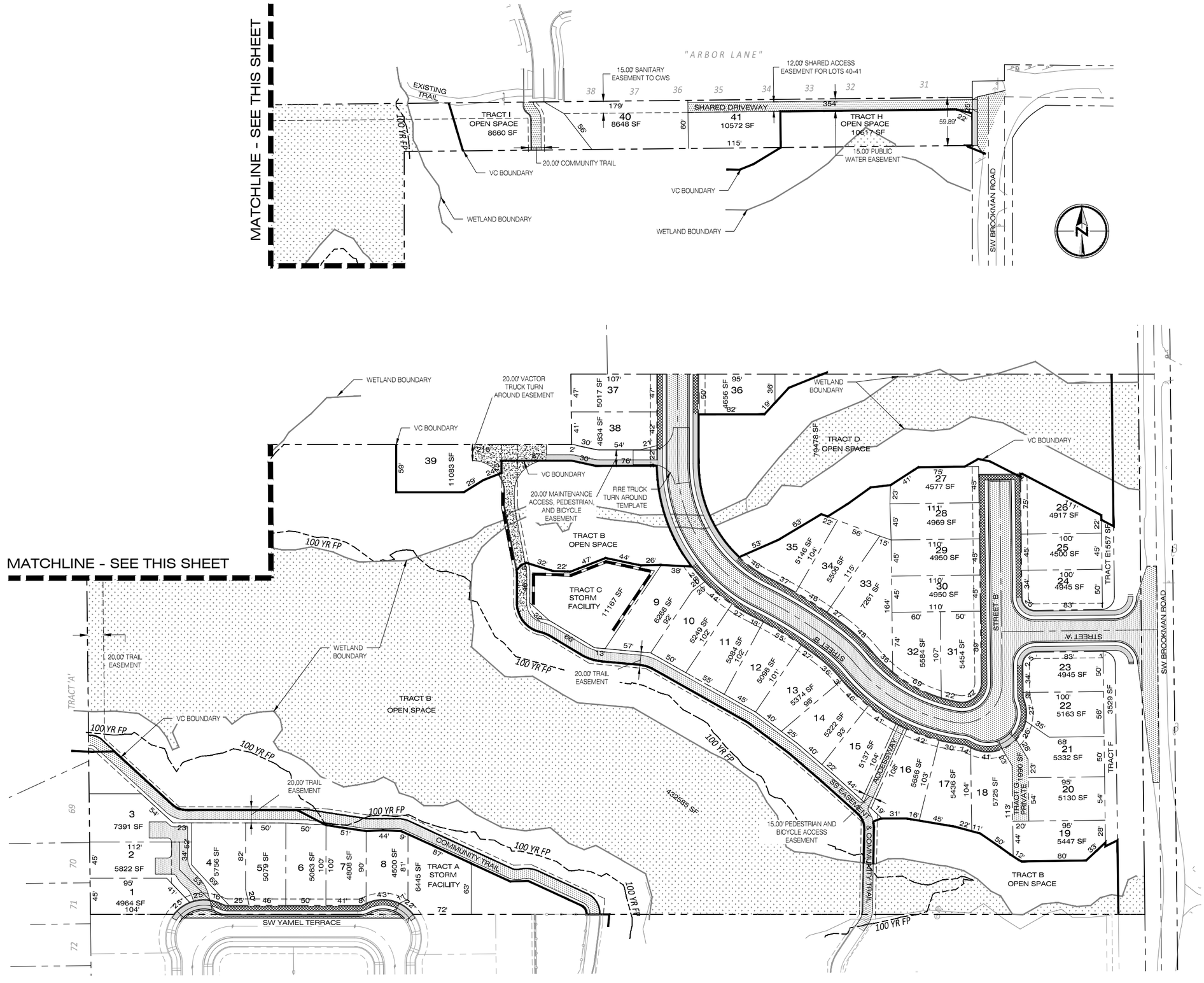
Site Plan
Cedar Creek Gardens
Sherwood, Oregon

Environmental Science & Assessment, LLC
4831 NE Fremont St., Suite 2B
Portland, OR 97213
Phone: 503.478.0424
www.esapdx.com

PIONEER DESIGN GROUP, INC.
CIVIL LAND USE PLANNING SURVEY
P 503.643.8286 F 844.715.4743 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

Exhibit C – Sheet P3.0, Preliminary Plat

Exhibit A26



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PORTLAND, OREGON | HONOLULU, HAWAII
PH: 503.643.8286 PH: 808.753.2276
WWW.PD-GRP.COM

PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P3.0plat.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.0

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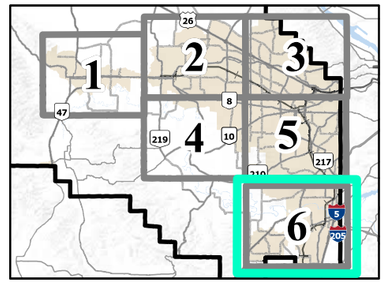
Exhibit D – Functional Classification, Urban Area Map 6 of 6

Washington County Transportation System Plan

Roadway Element



Functional Classification

Urban Area Map 6 of 6

- Freeway
- Principal Arterial
- Arterial
- Collector
- Neighborhood Route
- Proposed Arterial
- Proposed Collector
- Proposed Neighborhood Route
- Refinement Area
- Urban Area
- County Boundary
- Other Roads

0 2,000 4,000
Feet

1 inch equals 3,500 feet

N

Online Map: http://bit.ly/FunctionalClass

Department of Land Use & Transportation
Planning and Development Services Division

This map displays an unofficial representation of elements adopted as part of Washington County Transportation System Plan. It is not to be considered as official. Please contact Washington County Long Range Planning at (503) 846-3519 with any questions regarding this map.

\\Emcgis\nas\GISDATA\Workgroups\GISPlanning\COMP_PLAN\Transportation_Plan\TSP_ReferenceGuide_Maps\TSP_ReferenceGuide_Maps.aprx Date Exported: 9/25/2019

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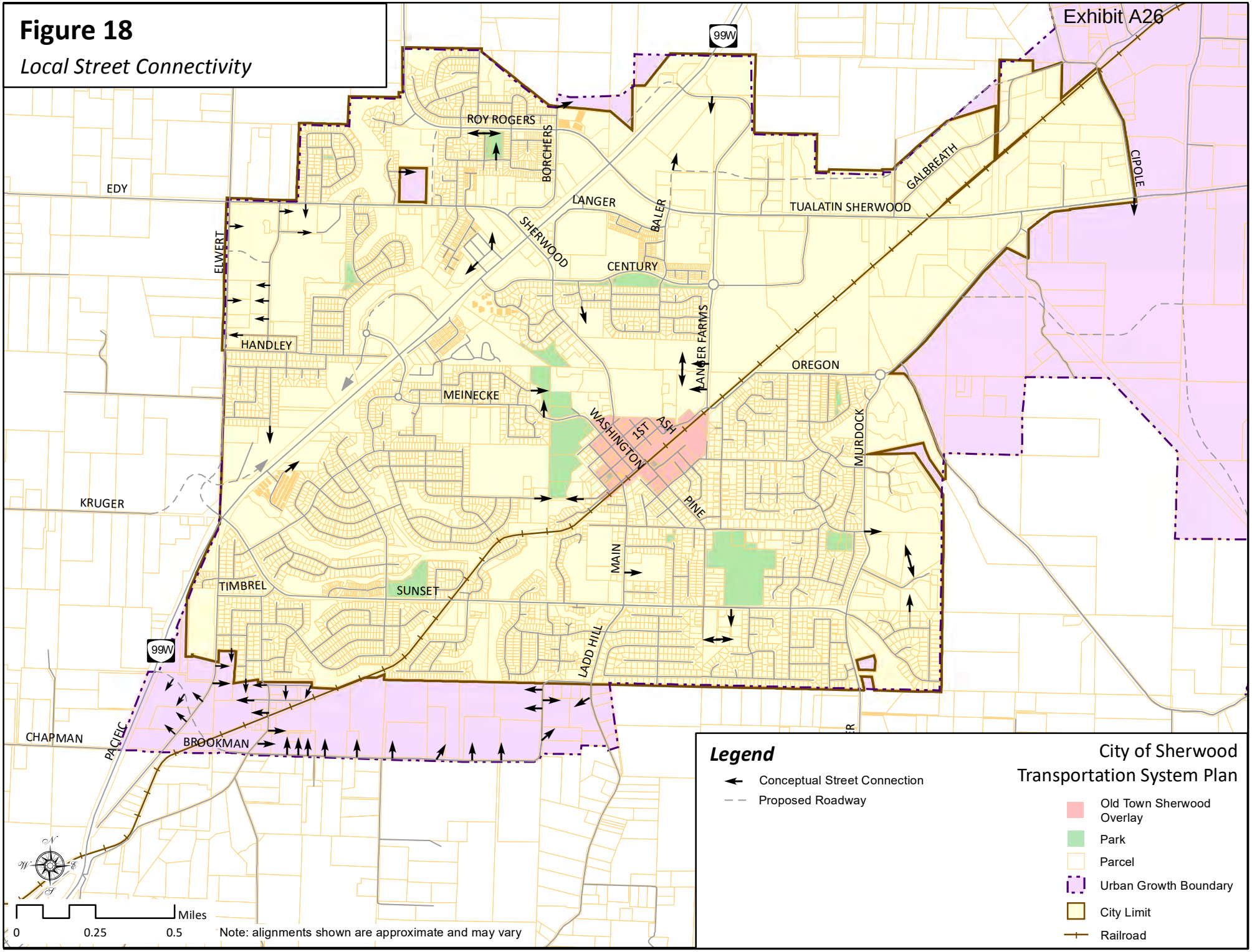
Portland, Oregon 97223

Exhibit E – Figure 18, Local Street Connectivity

Figure 18

Local Street Connectivity

Exhibit A26



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Portland, Oregon 97223

Exhibit F – Cedar Creek Gardens Subdivision Transportation Impact Analysis

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Cedar Creek Gardens Subdivision

Transportation Impact Analysis

Sherwood, Oregon

Date:
November 10, 2021

Prepared for:
Westwood Homes, LLC

Prepared by:
Jennifer Danziger, PE

REGISTERED PROFESSIONAL ENGINEER
16168
Digitally signed by Jennifer Danziger
Date: 2021.11.10 13:52:55-08'00'
OREGON
SEPT. 15, 1992
JENNIFER ELISE DANZIGER

RENEWS: 12/31/2021

List of Figures

List of Tables

Executive Summary

1. The proposed Cedar Creek Gardens subdivision will redevelop the properties located at 16871 and 17033 SW Brookman Road in Sherwood, Oregon. The proposed development includes the construction of 42 single-family homes, removing two existing homes for a net increase of 40 homes. Access to the site will be provided via two public street connections and one shared driveway connection along SW Brookman Road.
2. The proposed development is projected to generate an additional 32 morning peak hour, 41 evening peak hour trips, and 426 weekday trips.
3. No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. A review of existing sight lines and elevation profiles from Google Earth show that adequate sight distance can be available if the roadside vegetation is cleared with the development. Both the intersection sight distance and stopping sight distance can be met at the main site access and the shared driveway.
5. Left-turn lane warrants are not projected to be met at the site access intersection along SW Brookman Road upon completion and occupancy of the proposed development. Accordingly, installation of a left-turn lane at the site access intersection is not necessary or recommended.
6. All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.
7. Because the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both peak hours under all scenarios, agencies may wish to consider restriping the eastbound approach to provide a through and a right-turn lane. This change would eliminate occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping. The change is not necessary to accommodate the proposed development.
8. *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019, identified four intersections as currently exceeding acceptable jurisdictional standards. Based on the projected site trip impacts to these intersections, a total proportionate share fee to mitigate impacts of $69,274.39 was calculated.

Project Description

Introduction

This report describes and evaluates the transportation impacts associated with the proposed Cedar Creek Gardens subdivision located at 16871 and 17033 SW Brookman Road in Sherwood, Oregon. The proposed development includes the construction of 42 single-family homes, removing two existing homes for a net increase of 40 homes. Access to the site will be provided via two public street connections and one shared driveway connection along SW Brookman Road.

Based on correspondence with the City of Sherwood, a safety and capacity/level of service analysis was conducted at the following intersections:

1. SW Elwert Road/SW Sunset Boulevard at Highway 99W
2. SW Brookman Road at Highway 99W
3. SW Brookman Road at Middlebrook Site Access
4. SW Brookman Road at Main Site Access
5. SW Brookman Road at North Site Access

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The subject site is located at 16871 and 17033 SW Brookman Road and is situated adjacent to one in-process residential subdivision project: The Reserve at Cedar Creek. The site is located north of SW Brookman Road with The Reserve to the west. The subject property consists of two tax lots (3S10600 00107 and 00102) totaling approximately 20 acres. Each lot has an existing single-family house on the property which will be removed upon development.

Figure 1 displays a vicinity map of the project site, with the project site hatched and outlined in yellow. Other adjacent approved developments are shown in red, blue, and cyan. The future street network is represented with white. A site plan depicting the proposed project is provided in the appendix.

The site will take access from two public street connections and one shared driveway connection along SW Brookman Road. Eight (8) of the proposed homes will have driveways connecting to a roadway to be constructed as part of The Reserve subdivision. Their access to SW Brookman Road will be via a new roadway (SW White Oak Terrace) to be constructed as part of the Middlebrook subdivision. Thirty-one (31) of the proposed homes will access SW Brookman Road via a new roadway constructed with the subject subdivision. Three (3) of the proposed homes will share a driveway that will connect to SW Brookman Road at the northeast corner of the site.

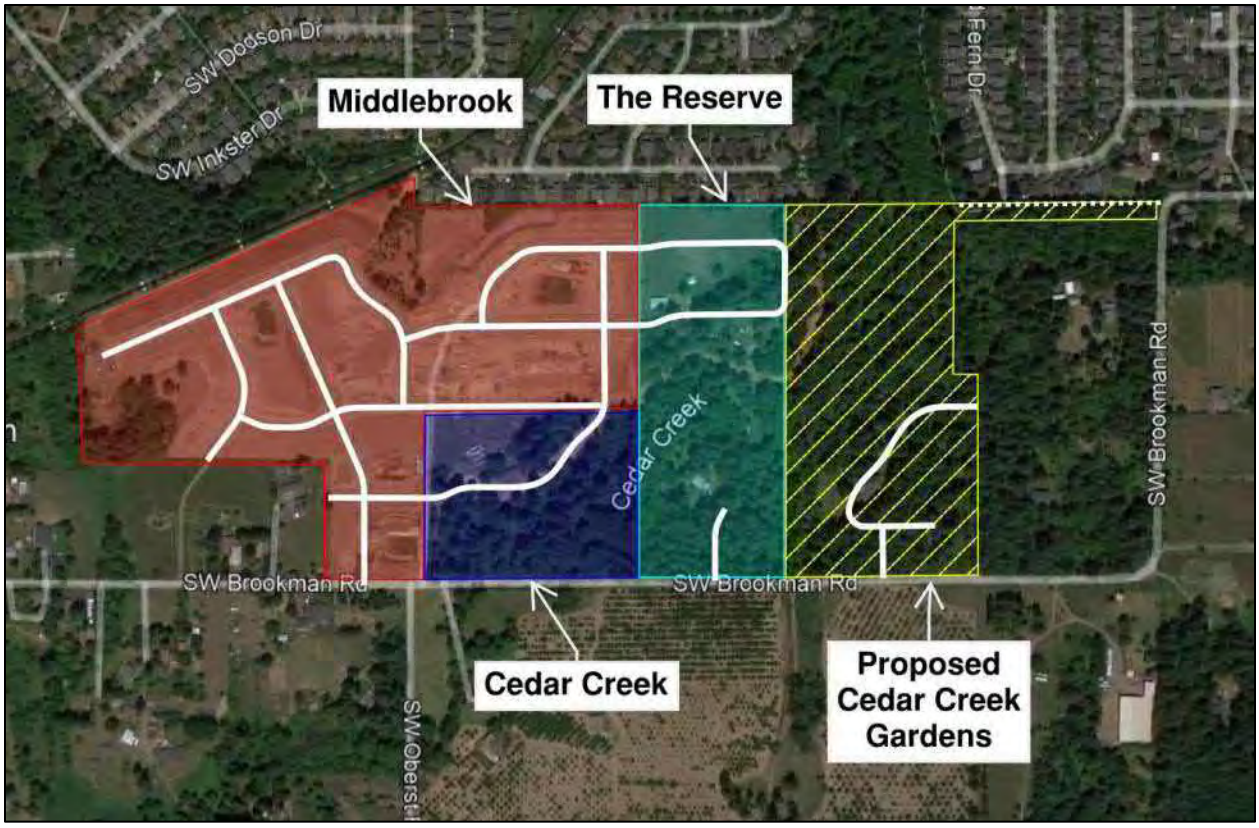


Figure 1: Project Location (image from Google Earth)

Vicinity Roadways

The proposed development is expected to impact three vicinity roadways. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Roadway	Jurisdiction	Functional Classification	Cross-Section	Speed (mph)	On-street Parking	Bicycle Lanes	Curbs & Sidewalks
Highway 99W	ODOT	Principal Arterial	4 Lanes	45-55 Posted	Not Permitted	Partial Both Sides	None
SW Elwert Rd/ SW Sunset Blvd	City of Sherwood	Arterial	2 to 3 Lanes	35 Posted	Not Permitted	Both Sides	Both Sides
SW Brookman Rd	Washington County	Arterial	2 Lanes	25/35/55 Posted/ Statutory	Not Permitted	None	None

Notes: Functional Classification based on the City of Sherwood Transportation System Plan

Study Intersections

The proposed development is expected to impact three vicinity intersections of significance. A summarized description of the study intersections is provided in Table 2.

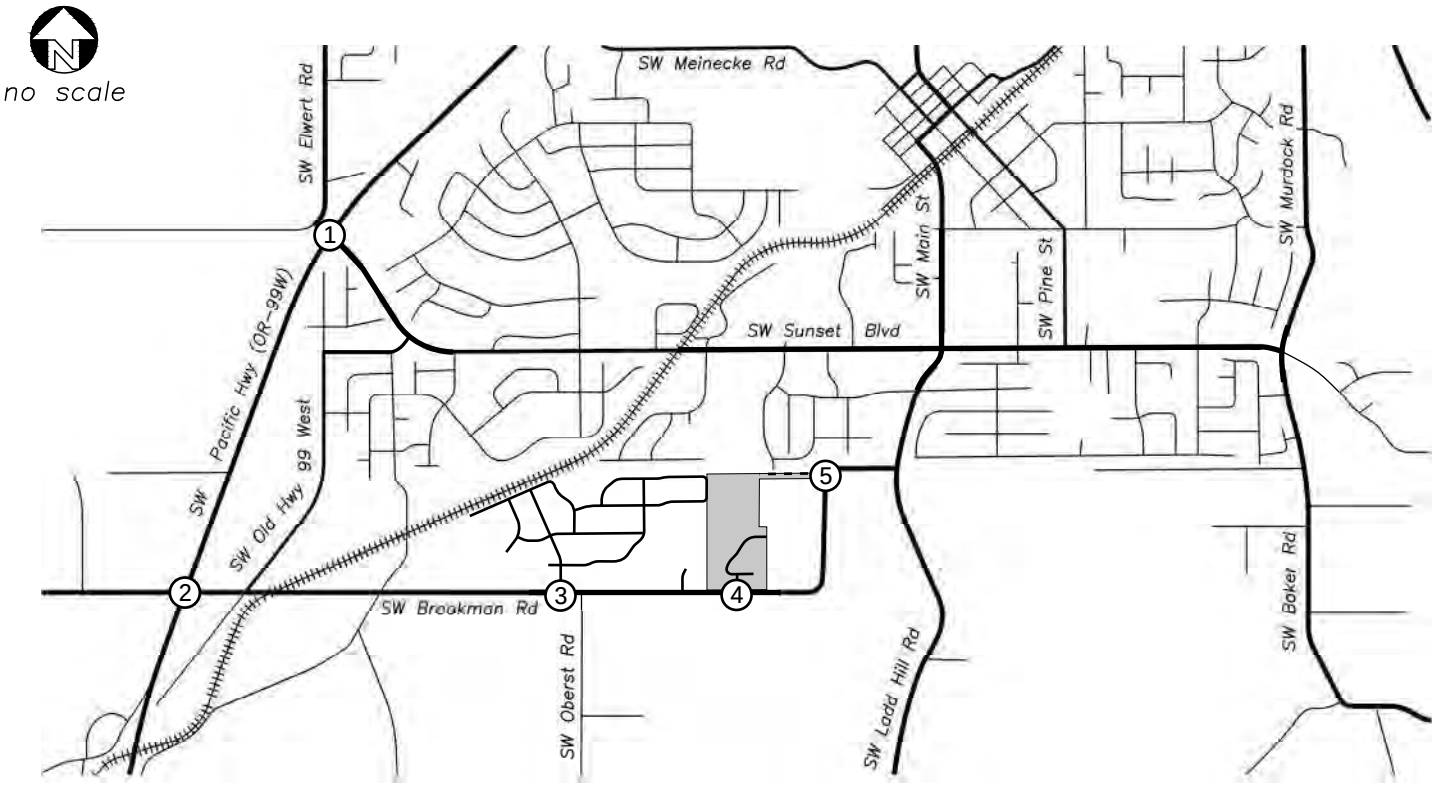
Table 2: Study Intersection Descriptions

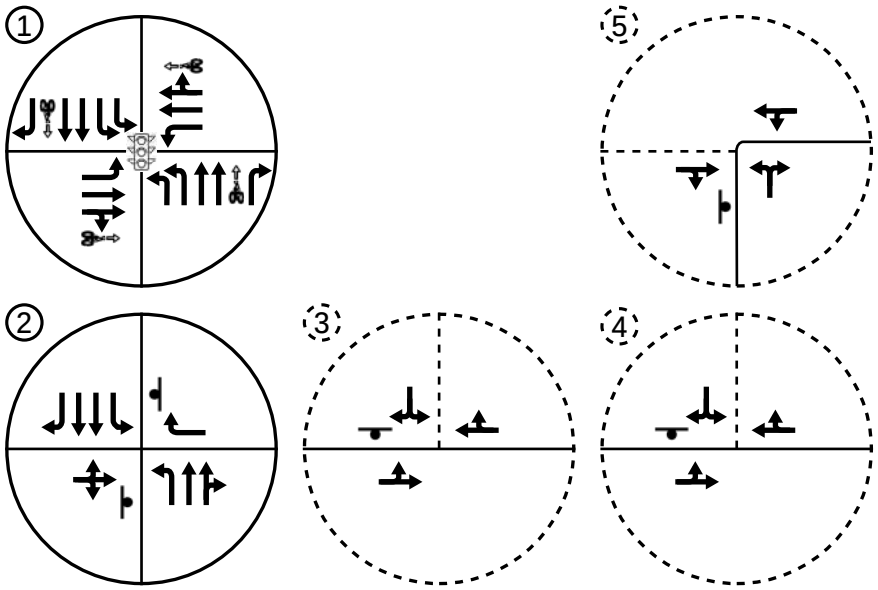
Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	SW Elwert Rd/SW Sunset Blvd at Highway 99W	Four-Legged	Signalized	WB/EB Permitted LT, NB/SB Protected LT
2	SW Brookman Rd at Highway 99W	Four-Legged	Stop-Controlled	EB/WB Stop Controlled Approach
3	SW Brookman Rd at Site Access	Three-Legged (Future)	Stop-Controlled	SB Stop Controlled Approach

A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.

Transit

No nearby transit service is available near the proposed development.





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VICINITY MAP &
LANE CONFIGURATIONS

Figure 2
Cedar Creek Gardens
11/10/2021

Site Trips

Trip Generation

The proposed development includes the construction of 42 single-family homes. As part of the proposed development, two existing single-family homes will be removed for a net increase of 40 homes.

To estimate the number of site trips generated under existing and proposed conditions, trip rates from the *Trip Generation Manual*[1] were used. Specifically, the equations from land-use codes 210, *Single-Family Detached Housing*, were used based on the number of dwelling units.

As shown in Table 3, the trip generation calculations show that the proposed development is projected to generate an additional 32 morning peak hour, 41 evening peak hour trips, and 426 weekday trips. Detailed trip generation calculations are included in the technical appendix.

Table 3: Trip Generation Summary

Land Use	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
Proposed Development	210	42 DU	9	25	34	28	16	44	454
Existing Homes	*210*	*2 DU*	*-1*	*-1*	*-2*	*-2*	*-1*	*-3*	*-28*
Net New Site Trips			**8**	**24**	**32**	**26**	**15**	**41**	**426**

Trip Distribution

The directional distribution of site trips to/from the project site was referenced from *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019. The following trip distribution was used for analysis:

- Approximately 45 percent of site trips will travel to/from the north along Highway 99W
- Approximately 10 percent of site trips will travel to/from the north along SW Main Street
- Approximately 10 percent of site trips will travel to/from the north along SW Murdock Road
- Approximately 10 percent of site trips will travel to/from the south along Highway 99W
- Approximately 10 percent of site trips will travel to/from the south along SW Ladd Hill Road
- Approximately 10 percent of site trips will travel to/from the south along SW Baker Road
- Approximately 5 percent of site trips will travel to/from the west along SW Kruger Road

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

Four intersections were identified as exceeding acceptable operation standards in *The Reserve TIA*:

A. SW Sunset Boulevard at SW Woodhaven Drive

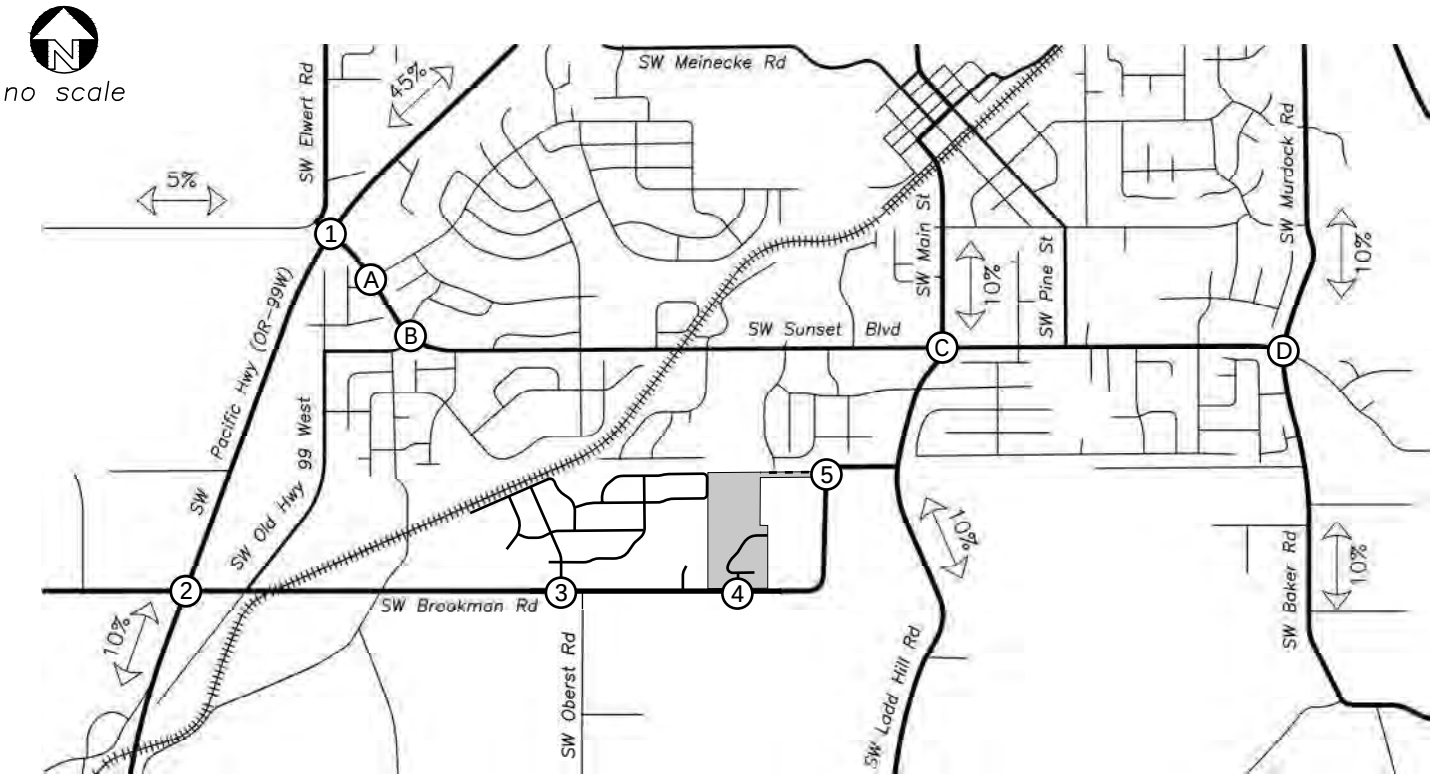
B. SW Sunset Boulevard at SW Timbrel Lane

C. SW Sunset Boulevard at SW Main Street/SW Ladd Hill Road

D. SW Sunset Boulevard at SW Murdock Road/SW Baker Road

Site trip assignment through these intersections was conducted to determine expected impacts from the proposed development to these intersections.

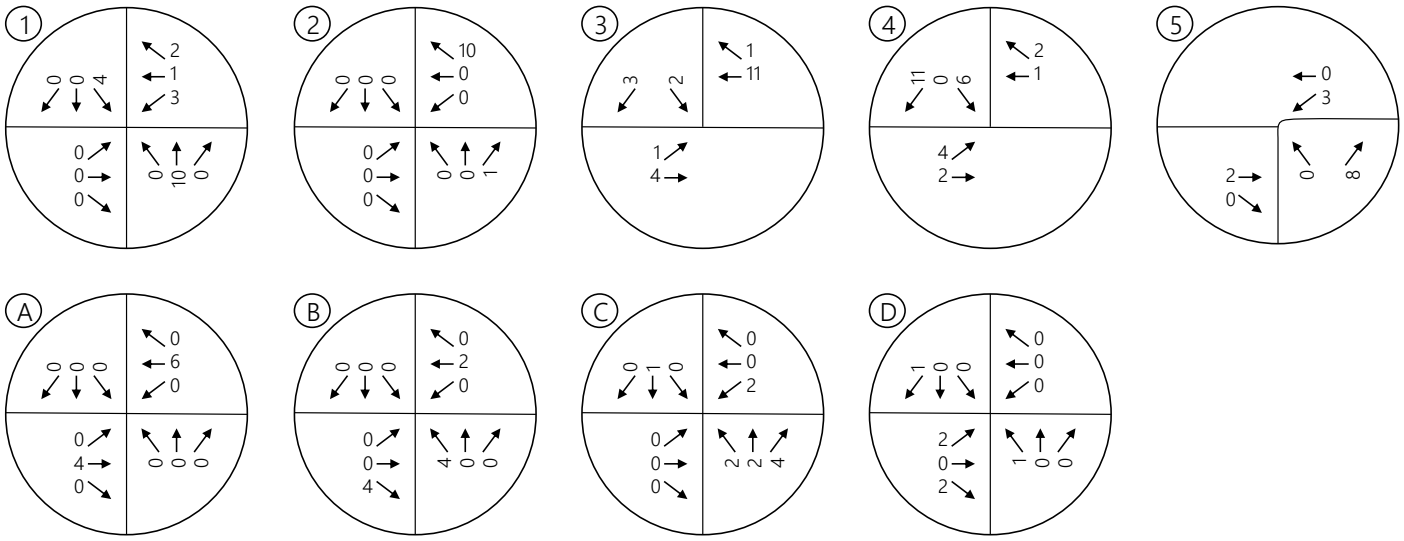
The trip assignment for site trips generated by the proposed development during is shown in Figure 3 for the morning peak hour and Figure 4 evening peak hour. This assignment reflects the layout of the proposed development with 8 homes using the Middlebrook subdivision access, 31 homes using the main site access, and 3 homes using the shared driveway.

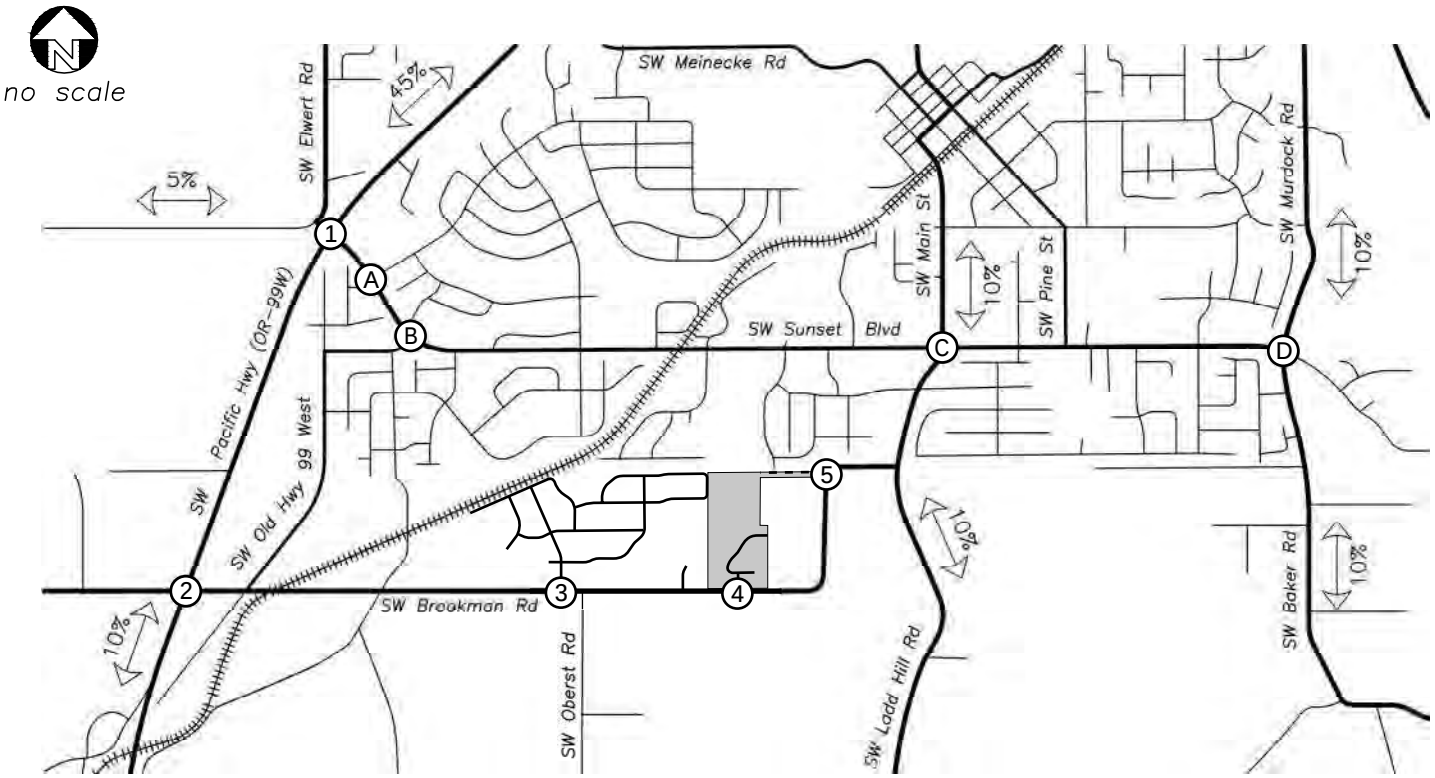


NET TRIP GENERATION

	In	Out	Total
AM	8	24	32
PM	26	15	41
DAILY	213	213	426

AM PEAK HOUR





NET TRIP GENERATION

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AM	8	24	32
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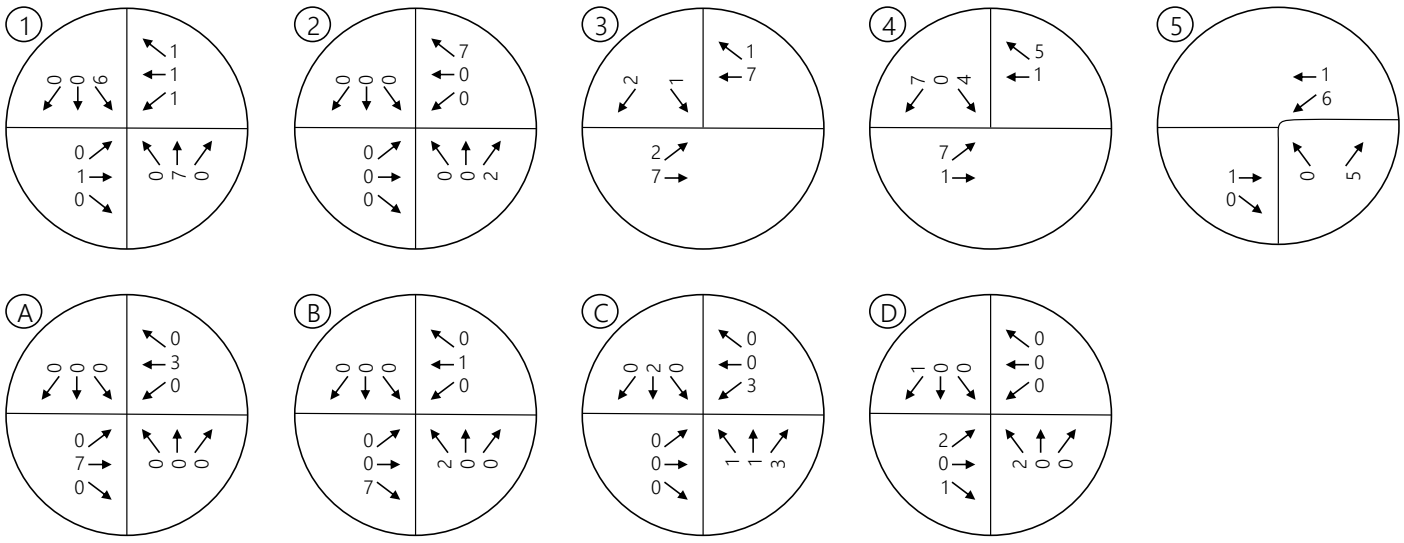
PM PEAK HOUR



Traffic Volumes

Existing Conditions

Due to the ongoing COVID-19 viral pandemic, traffic volumes have been depressed relative to normal conditions since mid-March 2020. Under these conditions, traditional traffic count data collection methods are not recommended. Therefore, to estimate existing traffic conditions, year 2017 traffic count data was referenced from *The Reserve TIA*, specifically volumes from Figures 4 and 5. Consistent with background growth methodologies used in *The Reserve TIA*, the year 2017 volumes were increased by 1% annually along Highway 99W and by 2% annually on all other movements at the study intersections to reflect existing year 2021 conditions. Note, these volumes do not capture the traffic demand from Sherwood High School, which was opened in the fall of 2021.

Since the traffic counts were collected, the westbound approach of SW Brookman Road at Highway 99W has been restricted to right turns only. The westbound left-turn and through volumes have been reassigned to reflect the traffic change. Ten percent of these movement was assumed to travel northbound to the signal at SW Sunset Boulevard and then U-Turn to travel southbound. Ninety percent was assumed to travel to SW Sunset Boulevard via other routes and turn left to travel southbound.

Figure 5 shows the existing traffic volumes at study intersections during the morning and evening peak hours.

Background Conditions

To provide analysis of the impact of the proposed development on the existing transportation facilities, an estimation of future traffic volumes is required. To reflect future traffic conditions without the proposed subdivision, volumes from two studies were used to estimate the Year 2024 background traffic volumes. *Year 2024 Total Intersection Operations* (Figures 12 and 13) volumes were referenced from *The Reserve TIA* and the trip assignments from the *Cedar Creek Subdivision TIA* (Figures 2 and 3) were added to those volumes. These volumes reflect the opening of the new Sherwood High School Campus.

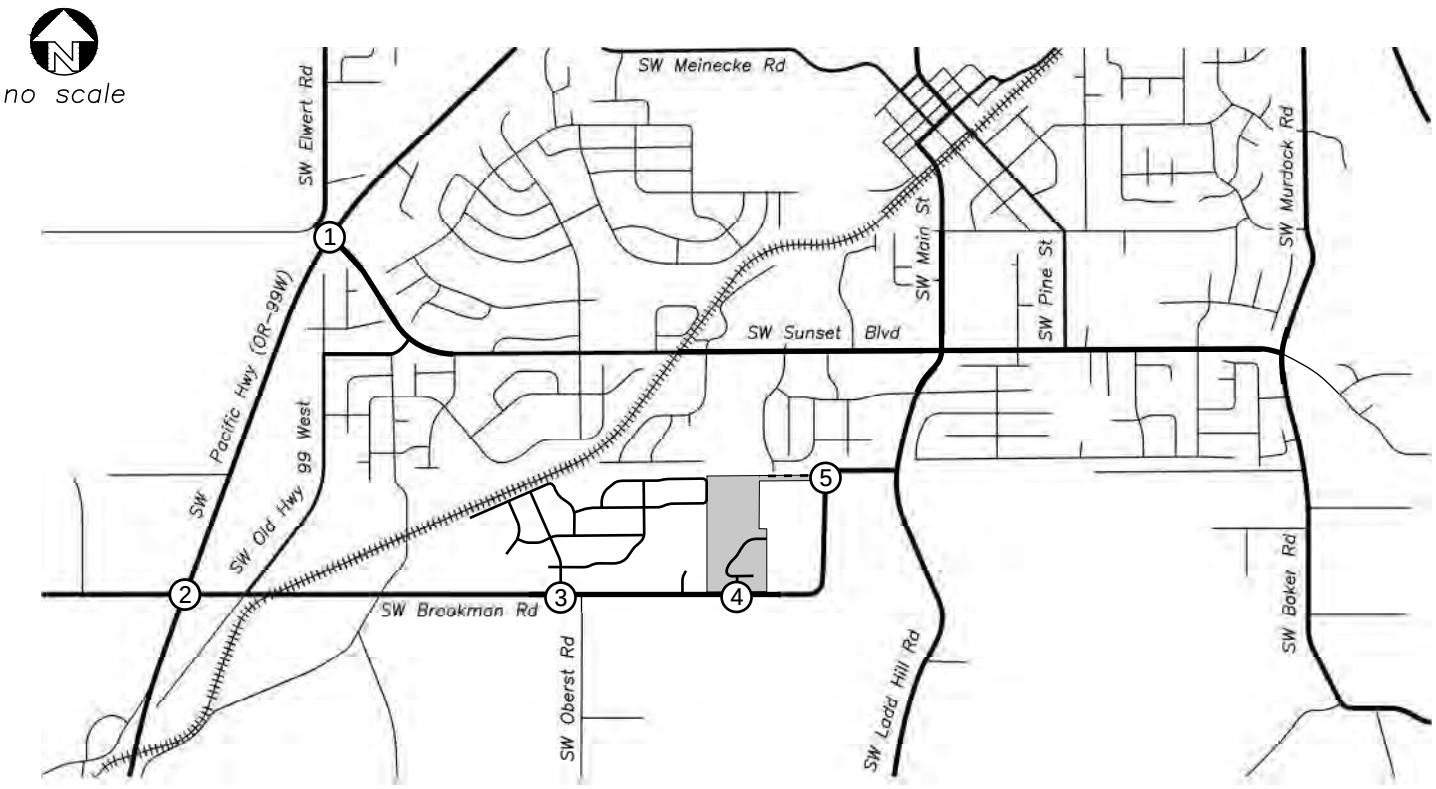
Note *The Reserve TIA* assumed additional turning movement restrictions at the intersection of SW Brookman Road at Highway 99W would be implemented by year 2024. The minor street approaches will be restricted to right-in/right-out only and U-turns along Highway 99W at the intersection would also be restricted. The volumes reflect this change.

Figure 6 shows the background traffic volumes at study intersections during the morning and evening peak hours.

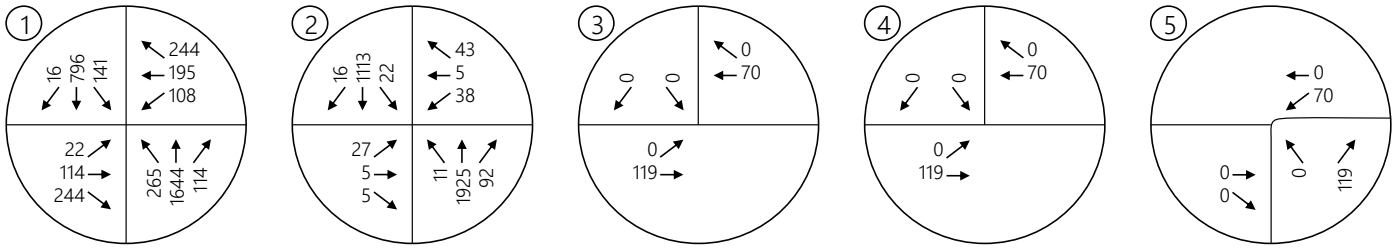
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2024 background traffic volumes to obtain the expected 2024 buildout volumes.

Figure 7 shows the buildout traffic volumes at study intersections during the morning and evening peak hours.



AM PEAK HOUR



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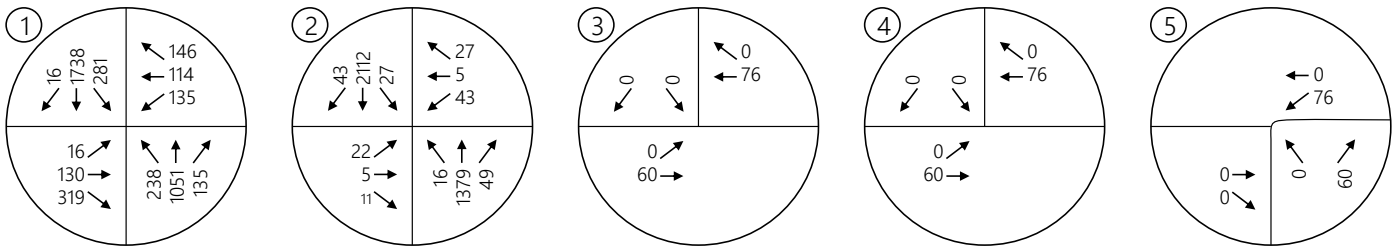

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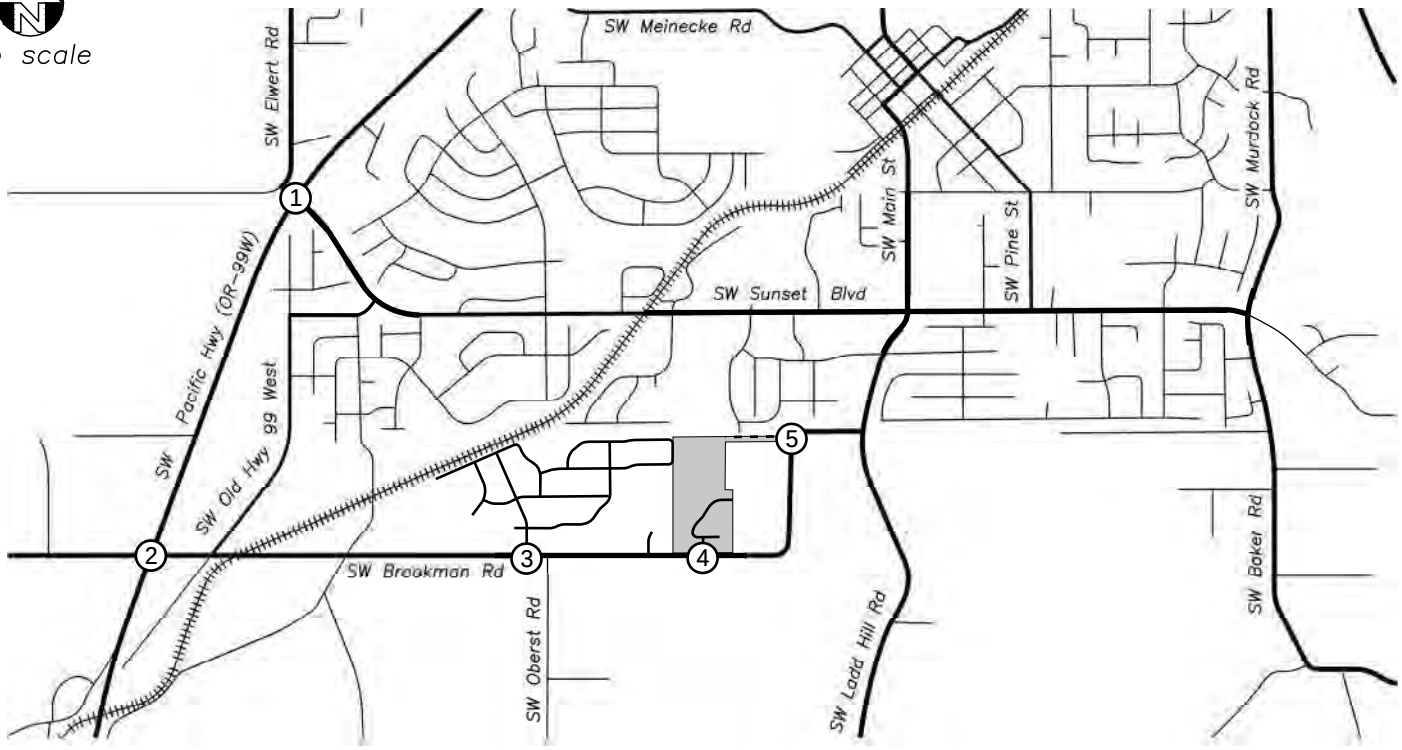

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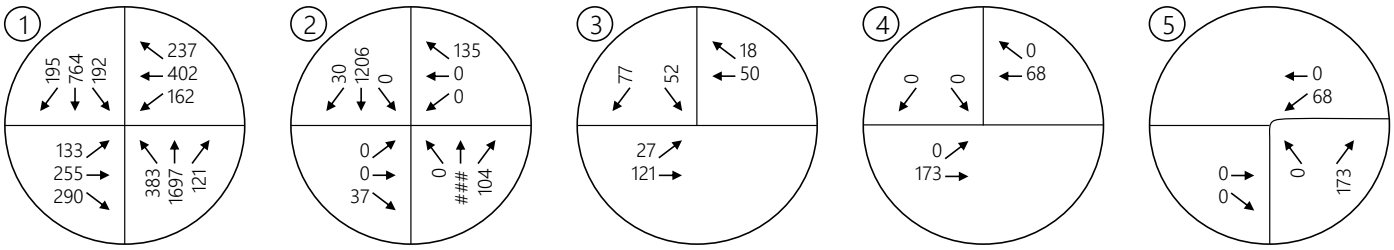

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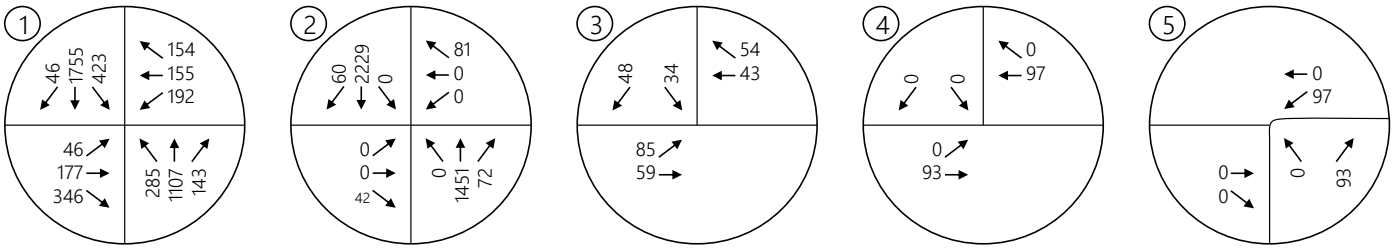

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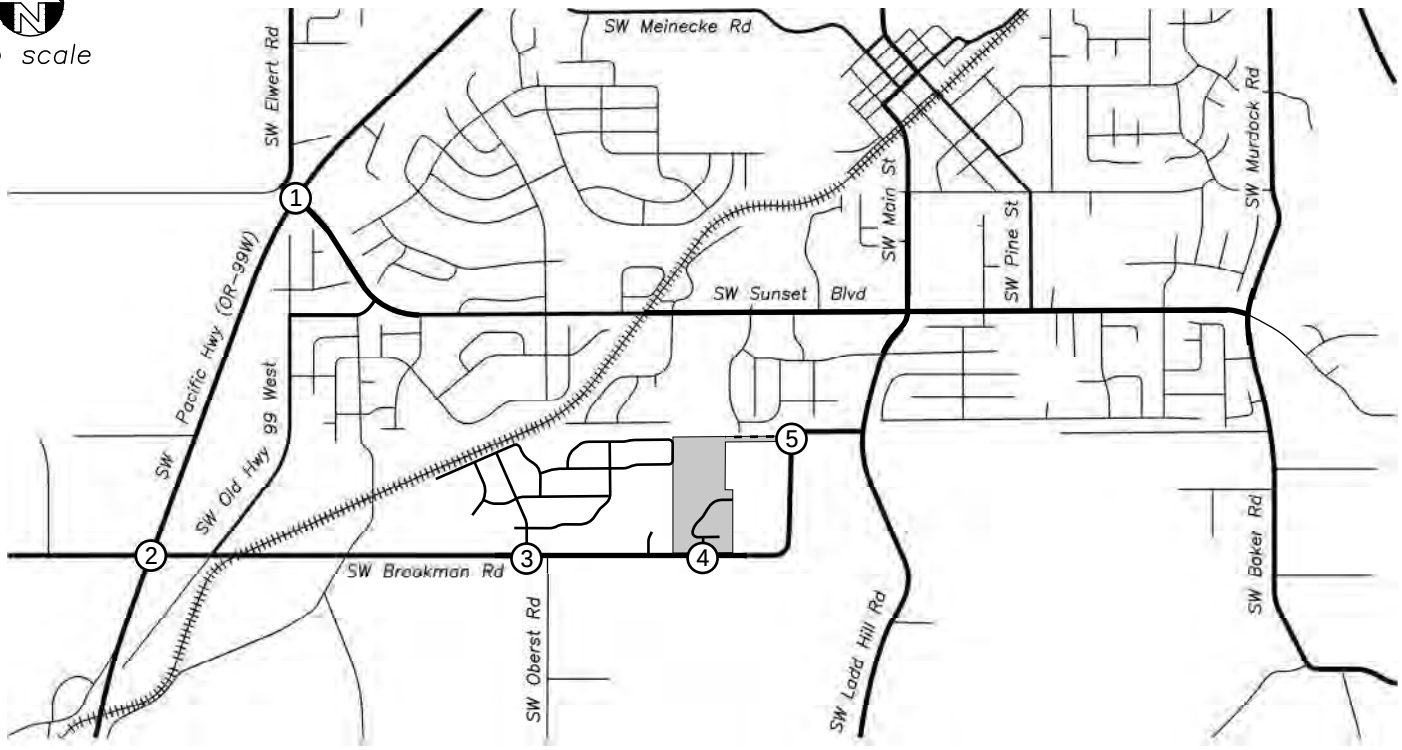
YEAR 2024 BACKGROUND CONDITIONS

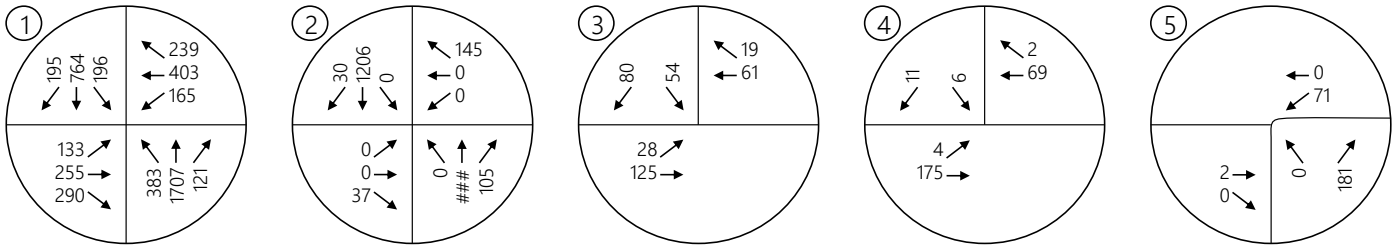
TRAFFIC VOLUMES

Figure 6
Cedar Creek Gardens
11/2/2021

no scale



AM PEAK HOUR



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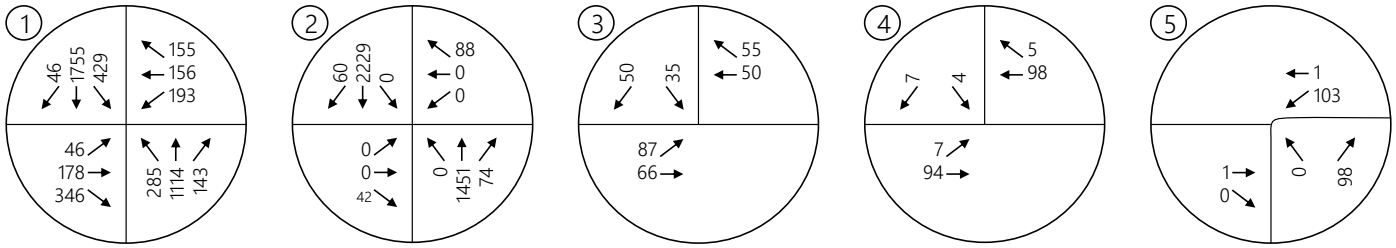

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YEAR 2024 BUILDOUT CONDITIONS

TRAFFIC VOLUMES

Figure 7
Cedar Creek Gardens
11/2/2021

Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2014 through December 2018) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- *PDO* – Property Damage Only;
- *Injury C* – Possible Injury;
- *Injury B* – Suspected Minor Injury;
- *Injury A* – Suspected Serious Injury; and
- *Fatality*

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents approximately 10 percent of the average daily traffic (ADT) at the intersection.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections. Detailed crash data is provided in the appendix to this report.

Table 4: Crash Type Summary

Intersection		Crash Type							Total Crashes
		Turn	Rear End	Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	SW Elwert Road/ SW Sunset Boulevard at Highway 99W	9	48	3	0	1	1	0	62
2	SW Brookman Rd at Highway 99W	8	2	17	1	1	0	0	29

Table 5: Crash Severity and Rate Summary

Intersection		Severity					Total Crashes	ADT	Crash Rate	ODOT 90th %
		PDO	C	B	A	Fatal				
1	SW Elwert Road/ SW Sunset Boulevard at Highway 99W	18	33	10	1	0	62	42,650	0.797	0.860
2	SW Brookman Rd at Highway 99W	14	6	8	1	0	29	37,000	0.429	0.860

Crash Severity

Two reported crashes were classified as *Injury A*:

- One rear-end collision occurred in 2019 between vehicles traveling northbound on Highway 99W at SW Elwert Road/SW Sunset Boulevard. The driver at fault was "following too closely."
- One angle collision occurred in 2015 on Highway 99W at SW Brookman Road. The crash involved a northbound motorcycle and a westbound passenger vehicle. The vehicle driver "did not yield right-of-way" to the motorcyclist who was seriously injured as a result of the collision.

Vulnerable Travelers

One turning collision reported in 2015 involved a southbound bicyclist traveling on the highway who was struck by a westbound passenger vehicles turning left from SW Sunset Boulevard onto the highway. The bicyclist was reported to have minor injuries (Injury B).

ODOT 90th Percentile Crash Rates

The study intersections adhere to the crash analysis methodologies within ODOT's Analysis Procedures Manual (APM). According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of their respective 90th percentile crash rates should be "flagged for further analysis". Crash rates in excess of 90th percentile crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

Intersection crash rates were calculated (Table 5); none have a rate above the respective ODOT 90th percentile crash rates.

ODOT Safety Priority Index System (SPIS)

The intersection of Highway 99W at SW Elwert Rd/SW Sunset Boulevard is reported in the worst 10 percent of intersections in ODOT's 2019 SPIS listing. No improvements are currently identified in the *2021-2024 Statewide Transportation Improvement Plan* that address this intersection.

Sight Distance Evaluation

A sight distance analysis was conducted at both the main site access and the shared driveway. To evaluate the sight distance available at these locations, intersection sight distance was measured in accordance with the current AASHTO manual[2]. According to AASHTO, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye-height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

AASHTO provides a recommendation for intersection sight distance (ISD) and a requirement for stopping sight distance (SSD). Intersection sight distance is an operational measure, intended to provide sufficient line of sight along the major street so that a driver could turn from the minor street with minimal impedance of traffic flow. Stopping sight distance is considered the minimum requirement to ensure safe operation of the roadway. Stopping sight distance allows an oncoming driver to see a hazard in the roadway, react, and come to a

[2] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.

complete stop if necessary to avoid a collision. As long as the available intersection sight distance is at least equal to the minimum required stopping sight distance for the design speed of the roadway, adequate sight distance is available for safe operation of the intersection.

A field investigation was conducted on Tuesday, November 2, 2021, to measure sight distance for this location. Figure 8 displays sight distance viewpoints from the future site accesses associated with the project. Due to existing vegetation, sight lines could not be viewed from 14.5 feet from the edge of the travel way.

Main Site Access

At the main site access on SW Brookman Road, the posted speed is 35 mph, but it transitions to 25 mph just east of the access. For the sight distance assessment, the speed of approaching vehicles was assumed to be 40 mph, which is 5 mph over the posted speed. At 40 mph, the recommended ISD is 445 feet and the required ISD is 305 feet.

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 445 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

Shared Driveway Access

At the shared driveway access on SW Brookman Road, the posted speed is 25 mph. For the sight distance assessment, the speed of approaching vehicles was assumed to be 25 mph due to the curvature of the roadway. At 25 mph, the recommended ISD is 280 feet and the required ISD is 155 feet.

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 280 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

A. Main Site Access Looking East

B. Main Site Access Looking West

C. Shared Driveway Looking East

D. Shared Driveway Looking South

Figure 8: Sight Line Photos at Future Site Accesses

Warrant Analysis

Left-turn lane warrants were examined for the site access intersection under year 2024 buildout conditions. A left-turn refuge is primarily a safety consideration for the major-street approach, removing left-turning vehicles from the through traffic stream.

Warrants for an eastbound left-turn lane at the site access intersection were based on the methodology outlined in the National Cooperative Highway Research Program (NCHRP) Report Number 457[3]. This methodology evaluates the need for a left-turn lane based on the number of left-turning vehicles, the number of travel lanes, the number of advancing and opposing vehicles, and the roadway travel speed.

Left-turn lane warrants are not projected to be met upon completion and occupancy of the proposed development. The detailed warrant analysis is included in the appendix.

[3] Bonneson, James A. and Michael D. Fontaine, *NCHRP Report 457: An Engineering Study Guide for Evaluating Intersection Improvements*, Transportation Research Board, 2001.

Operational Analysis

A capacity and delay analysis was conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual*[4] (HCM). Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates little, or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

The operating standards adopted by Washington County, ODOT, and the City of Sherwood are summarized below.

Washington County

SW Brookman Road is under the jurisdiction of Washington County. The County has defined operating standards for signalized and stop controlled intersections as follows:

- For signalized intersections, the maximum intersection v/c ratio shall be no greater than 0.99.
- For unsignalized intersections, no movement shall experience a v/c ratio greater than 0.99.

ODOT

ODOT operates and maintains Highway 99W. ODOT's operating mobility target for intersections along Highway 99W in the study area is an intersection v/c ratio no greater than 0.99 during the 1st and 2nd peak hours per Table 7 of the *Oregon Highway Plan*[5].

City of Sherwood

According to the City of Sherwood's Transportation System Plan (TSP), both signalized and unsignalized intersections under City jurisdiction must operate at LOS D or better with a v/c ratio of 0.85 or less; however, two-way stop-controlled intersections are required to operate at LOS E or better with a v/c ratio of 0.90 or less[6].

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6 for the morning and evening peak hours. Detailed calculations are included in the appendix.

[4] Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.
[5] Oregon Department of Transportation, *Oregon Highway Plan*. 1999
[6] City of Sherwood, *Sherwood Transportation System Plan*. Adopted June 17th, 2014.

Table 6: Capacity Analysis Summary

Intersection & Condition	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SW Elwert Road/SW Sunset Boulevard at Highway 99W						
2021 Existing Conditions	C	25	0.78	C	34	0.86
2024 Background Conditions	D	40	0.94	D	46	0.95
2024 Buildout Conditions	D	41	0.95	D	46	0.95
2. SW Brookman Road at Highway 99W						
2021 Existing Conditions	F	60	0.37	F	212	0.83
2024 Background Conditions	F	63	0.73	D	30	0.23
2024 Buildout Conditions	F	70	0.79	D	30	0.23
3. SW Brookman Road at Middlebrook Site Access						
2024 Background Conditions	B	11	0.24	B	11	0.17
2024 Buildout Conditions	B	11	0.25	B	11	0.18
4. SW Brookman Road at Main Sitrie Access						
2024 Buildout Conditions	A	10	0.03	A	10	0.02
5. SW Brookman Road at North Site Access						
2024 Buildout Conditions	B	11	0.01	B	10	0.01

BOLDED results indicate operation above acceptable jurisdictional standards.

As shown, all study intersections are projected to operate within agency standards under all analysis scenarios for all conditions. These results differ slightly from the conclusions in previous studies for the following reasons:

- At the intersection of SW Elwert Road/SW Sunset Boulevard at Highway 99W, the analysis outputs indicate that the eastbound shared through-right lane acts as a de facto right-turn lane and recommends recoding the lane to reflect the condition. When the approach is recoded to show a single through lane and a right-turn lane, operations improve measurably because the right-turn factor is only applied to one lane rather than two lanes.
- According to the APM software settings for signalized intersection analysis, "ODOT default for lost time is 4.0 seconds." Therefore, all lost times were adjusted appropriately following the procedures in the APM.

Based on the above analysis and findings, all study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.

As shown in Figure 7, the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both the morning and evening peak hours. Restriping the eastbound approach to provide a through and a right-turn lane could improve flow at the intersection because it would eliminate

occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping.

Proportionate Share Mitigation Assessment

Consistent with *The Reserve TIA*, proportionate share fees were calculated at intersections determined as failing, using methodologies similar to those presented in Table 6 of the referenced TIA. Table 7 provides the methodology used to calculate proportionate share fees based on the Cedar Creek Gardens trip assignment.

Table 7: Proportionate Share Methodolgy Summary

Intersection	A. SW Sunset Boulevard at SW Woodehaven Drive	B. SW Sunset Boulevard at SW Timbrel Lane	C. SW Sunset Boulevard at SW Main Street/SW Ladd Hill Road	D. SW Sunset`` Boulevard at SW Murdock Road/SW Baker Road
Mitigation Project Summary	Construct Traffic Signal	Construct Mini Roundabout	Construct Traffic Signal	Construct NB LTL & SB RTL
City TSP Project ID	NA	D28	D26	D33
Peak Hour	Weekday AM	Weekday AM	Weekday PM	Weekday PM
Scenario Triggering Mitigation	No Build (2024)	No Build (2024)	No Build (2024)	No Build (2024)
Existing Total Entering Volume, TEV (X)	1,012	894	1,208	1,208
2024 No Build (Background with RIRO, Y)	1,541	1,318	1,487	1,371
2024 Project Trips (PT)	10	10	10	6
Background Growth (Z=Y-X)	529	424	279	163
Proportional Share (%, PT/(PT+Z))	1.86%	2.30%	3.46%	3.55%
Mitigation Cost Estimate ($)	$1,050,000	$630,000	$250,000	$750,000
Cost Estimate Reference	DKS (Ref 10)	DKS (Ref 10)	TSP (Ref 5)	TSP (Ref 5)
Proportional Share Cost	$19,480.52	$14,516.13	$8,650.52	$26,627.22
Total	$69,274.39			

Based on the proportionate share fee calculations, a total proportionate share fee to mitigate site trip impacts to the above intersections is $69,274.39.

Conclusions

Key findings of this study include:

- No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
- A review of existing sight lines and elevation profiles from Google Earth show that adequate sight distance can be available if the roadside vegetation is cleared with the development. Both the intersection sight distance and stopping sight distance can be met at the main site access and the shared driveway.
- Left-turn lane warrants are not projected to be met at the site access intersection along SW Brookman Road upon completion and occupancy of the proposed development. Accordingly, installation of a left-turn lane at the site access intersection is not necessary or recommended.
- All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.
- Because the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both peak hours under all scenarios, agencies may wish to consider restriping the eastbound approach to provide a through and a right-turn lane. This change would eliminate occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping. The change is not necessary to accommodate the proposed development.
- *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019, identified four intersections as currently exceeding acceptable jurisdictional standards. Based on the projected site trip impacts to these intersections, a total proportionate share fee to mitigate impacts of $69,274.39 was calculated.

Appendix

- Site Plan
- Trip Generation
- Traffic Counts
- Reference Study Volumes
- In Process Trips
- Crash Data
- Sight Lines and Elevation Profiles
- Warrant Calculations
- Level of Service Definitions
- Operational Outputs

Exhibit A26

MATCHLINE - SEE THIS SHEET

"ARBOR LANE"

12.00' SHARED ACCESS EASEMENT FOR LOTS 40-42

EXISTING TRAIL

COMMUNITY TRAIL

100 YR FP

VC BOUNDARY

WETLAND BOUNDARY

40 6062 SF

41 10421 SF

42 10522 SF

SHARED DRIVEWAY

TRACT H OPEN SPACE 10660 SF

SW BROOKMAN ROAD

WETLAND BOUNDARY

VC BOUNDARY

20.00' VACTOR TRUCK TURN AROUND EASEMENT

37 5017 SF

38 4884 SF

36 4656 SF

39 11033 SF

TRACT D OPEN SPACE 79478 SF

TRACT B OPEN SPACE

TRACT C STORM FACILITY 11167 SF

27 4577 SF

28 4969 SF

29 4950 SF

30 4950 SF

25 4500 SF

24 4945 SF

26 4917 SF

35 5146 SF

34 5506 SF

33 7261 SF

9 6209 SF

10 5309 SF

11 5084 SF

12 5098 SF

13 5374 SF

14 5222 SF

15 5137 SF

32 5584 SF

31 5454 SF

STREET 'B'

STREET 'A'

TRACT E

TRACT F

TRACT G PRIVATE

23 4945 SF

22 5176 SF

21 5319 SF

20 5130 SF

19 5447 SF

16 5656 SF

17 5436 SF

18 5725 SF

ACCESSWAY

35' EASEMENT

15.00' PEDESTRIAN AND BICYCLE ACCESS EASEMENT

TRACT B OPEN SPACE

TRACT 'A'

TRACT B OPEN SPACE 430014 SF

20.00' TRAIL EASEMENT

3 7276 SF

2 5659 SF

1 4944 SF

4 6010 SF

5 5123 SF

6 5063 SF

7 5023 SF

8 5015 SF

TRACT A STORM FACILITY 7320 SF

SW YAMEL TERRACE

SCALE 60 0 30 60

1 INCH = 60 FEET

PIONEER DESIGN GROUP

CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE

PORTLAND, OREGON | HONOLULU, HAWAII

PH: 503.643.8286 PH: 808.753.2276

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PRELIMINARY PLAT

CEDAR CREEK GARDENS

CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P3.0plat.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS

No.
285-021

Type
PLANNING

Sheet
P3.0

B:\Projects\285-021-19\Planning\28521_P3.0plat.dwg 10/20/2021 12:27:11 PM

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 42

AM PEAK HOUR

Trip Equation: Ln(T)=0.91Ln(X)+0.120

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	9	25	34

PM PEAK HOUR

Trip Equation: Ln(T)=0.94Ln(X)+0.27

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	28	16	44

WEEKDAY

Trip Equation: Ln(T)=0.92Ln(X)+2.68

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	227	227	454

SATURDAY

Trip Equation: Ln(T)=0.97Ln(X)+2.4

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	207	207	414

Source: Trip Generation Manual, 11th Edition

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 2

AM PEAK HOUR

Trip Equation: Ln(T)=0.91Ln(X)+0.120

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	1	1	2

PM PEAK HOUR

Trip Equation: Ln(T)=0.94Ln(X)+0.27

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	2	1	3

WEEKDAY

Trip Equation: Ln(T)=0.92Ln(X)+2.68

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	14	14	28

SATURDAY

Trip Equation: Ln(T)=0.97Ln(X)+2.4

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	11	11	22

Source: Trip Generation Manual, 11th Edition

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

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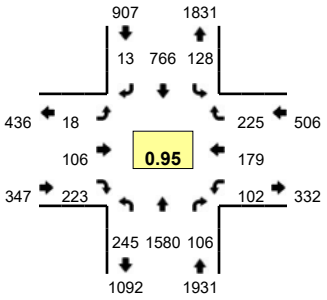
QC JOB #: 14401717

CITY/STATE: Sherwood, OR

DATE: Thu, May 11 2017



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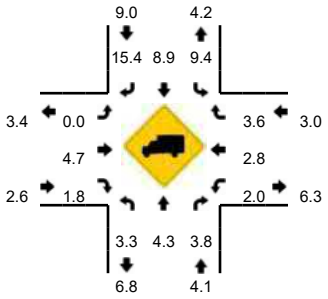
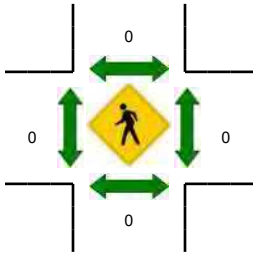
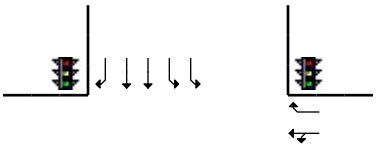
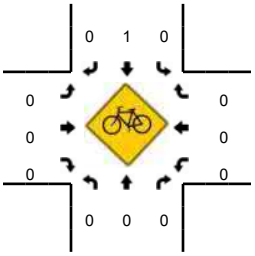
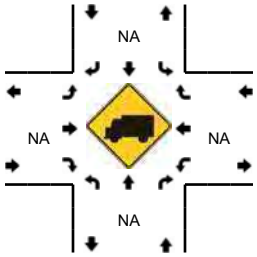
Peak 15-Min: 7:40 AM -- 7:55 AM

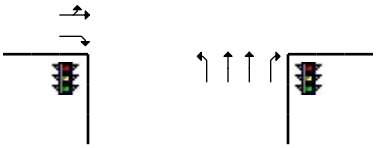


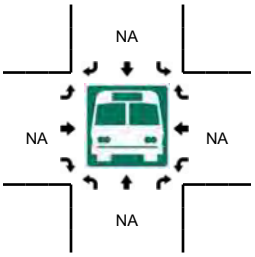












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Elwert Rd/SW Sunset Blvd (Eastbound)				SW Elwert Rd/SW Sunset Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	22	126	6	0	2	43	0	1	0	5	15	0	11	13	12	0	256	
7:05 AM	10	136	9	0	3	71	2	0	3	5	19	0	8	8	17	0	291	
7:10 AM	20	118	8	0	8	54	1	1	1	7	25	0	14	19	12	0	288	
7:15 AM	34	127	9	0	6	44	1	1	1	9	17	0	9	15	19	0	292	
7:20 AM	23	140	8	0	5	60	0	0	3	5	16	0	16	8	16	0	300	
7:25 AM	22	154	14	0	7	76	1	0	0	5	14	0	3	15	16	0	327	
7:30 AM	19	119	7	0	11	50	1	1	4	14	20	0	4	21	17	0	288	
7:35 AM	22	123	5	0	12	52	1	1	1	9	14	0	13	25	16	0	294	
7:40 AM	20	139	9	0	13	64	0	1	1	9	14	0	7	19	19	0	315	
7:45 AM	23	122	7	0	20	69	2	2	2	9	21	0	7	15	23	0	322	
7:50 AM	14	121	8	0	11	100	2	0	0	13	24	0	8	14	23	0	338	
7:55 AM	26	115	10	0	17	59	1	1	2	10	20	0	7	11	29	0	308	3619
8:00 AM	11	166	12	1	7	67	1	0	0	11	19	0	6	9	18	0	328	3691
8:05 AM	8	79	9	0	8	63	0	1	1	5	26	0	10	5	15	0	230	3630
8:10 AM	16	81	4	0	6	48	0	3	2	2	11	0	7	14	12	0	206	3548
8:15 AM	12	133	6	0	6	83	0	1	1	4	12	0	5	7	12	0	282	3538
8:20 AM	23	98	8	0	6	40	0	4	0	6	16	0	7	8	7	0	223	3461
8:25 AM	11	110	9	0	6	55	0	2	2	2	19	0	7	8	9	0	240	3374
8:30 AM	16	76	5	0	13	51	0	3	0	3	10	0	7	6	14	0	204	3290
8:35 AM	17	128	7	0	7	66	2	1	1	8	13	0	5	9	11	0	275	3271
8:40 AM	9	112	11	0	9	62	1	1	1	3	10	0	3	4	3	0	229	3185
8:45 AM	8	93	8	0	7	60	0	0	1	4	10	0	11	8	17	0	227	3090
8:50 AM	9	96	11	0	3	59	0	1	1	7	23	0	7	6	12	0	235	2987
8:55 AM	9	86	6	0	8	74	1	3	1	8	8	0	5	3	11	0	223	2902

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	228	1528	96	0	176	932	16	12	12	124	236	0	88	192	260	0	3900
Heavy Trucks	12	68	4		12	60	4		0	4	0		0	4	16		184
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM

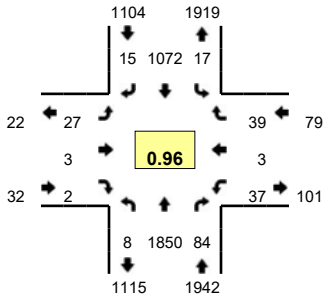
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: SW Pacific Hwy -- SW Chapman Rd
CITY/STATE: Sherwood, OR

QC JOB #: 14401706
DATE: Thu, May 11 2017



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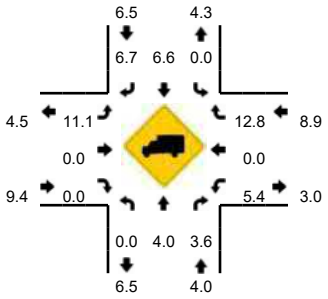
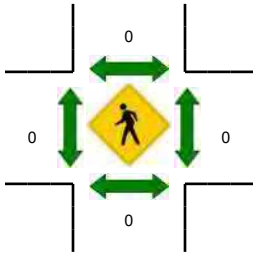
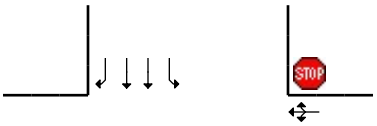
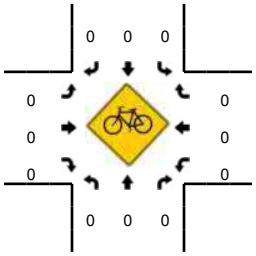
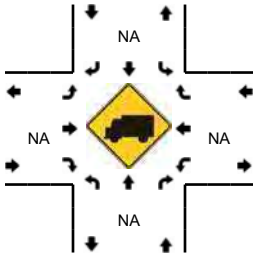
Peak 15-Min: 7:30 AM -- 7:45 AM

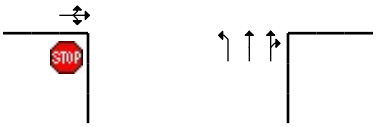


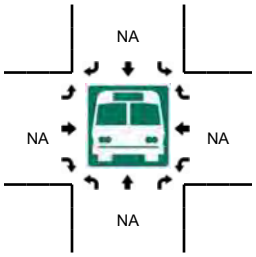












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Chapman Rd (Eastbound)				SW Chapman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	133	2	0	0	74	0	0	1	0	0	0	4	0	3	0	217	
7:05 AM	0	169	5	1	0	81	4	0	0	0	0	0	2	0	0	0	262	
7:10 AM	0	159	6	0	0	99	1	1	1	0	0	0	1	0	1	0	269	
7:15 AM	1	165	11	0	1	75	0	0	0	1	0	0	2	0	2	0	258	
7:20 AM	0	174	7	0	0	100	0	1	1	1	0	0	3	0	1	0	288	
7:25 AM	0	141	8	1	1	78	1	0	3	0	0	0	4	0	2	0	239	
7:30 AM	0	177	8	0	1	84	0	0	4	0	1	0	0	1	4	0	280	
7:35 AM	0	177	8	0	0	85	1	0	0	0	0	0	4	0	3	0	278	
7:40 AM	1	147	14	1	1	85	1	0	4	0	0	0	3	1	5	0	263	
7:45 AM	1	142	9	0	4	99	2	0	3	0	0	0	2	0	4	0	266	
7:50 AM	0	147	6	0	1	125	1	1	2	0	0	0	4	1	3	0	291	
7:55 AM	1	133	1	0	3	82	2	0	1	1	1	0	8	0	6	0	239	3150
8:00 AM	0	119	1	1	2	79	2	0	8	0	0	0	4	0	8	0	224	3157
8:05 AM	0	98	4	0	2	85	4	0	5	0	0	0	2	1	1	0	202	3097
8:10 AM	0	127	2	0	1	82	1	0	0	1	0	0	3	0	1	0	218	3046
8:15 AM	0	130	3	0	2	72	2	0	3	0	1	0	2	0	2	0	217	3005
8:20 AM	1	135	6	0	1	89	1	1	0	1	0	0	3	0	2	0	240	2957
8:25 AM	0	115	5	0	3	63	0	0	0	0	0	0	0	0	1	0	187	2905
8:30 AM	0	127	3	0	1	71	0	0	1	0	0	0	3	1	3	0	210	2835
8:35 AM	0	118	3	0	1	83	2	0	2	0	0	0	0	1	1	0	211	2768
8:40 AM	1	143	0	1	1	68	2	1	1	0	0	0	3	0	0	0	221	2726
8:45 AM	0	108	1	0	1	87	4	1	0	1	0	0	3	0	2	0	208	2668
8:50 AM	1	127	3	0	0	88	1	0	0	1	1	0	1	0	1	0	224	2601
8:55 AM	0	93	4	0	1	89	3	0	2	1	1	0	3	1	1	0	199	2561

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	2004	120	4	8	1016	8	0	32	0	4	0	28	8	48	0	3284
Heavy Trucks	0	64	4		0	100	0		0	0	0		4	0	4		176
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM

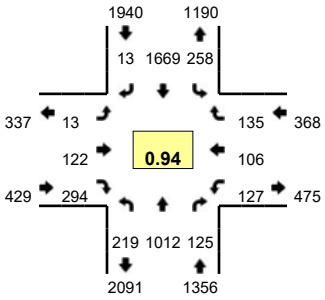
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

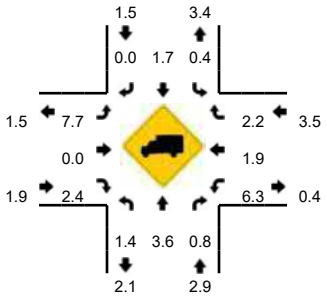
Method for determining peak hour: Total Entering Volume

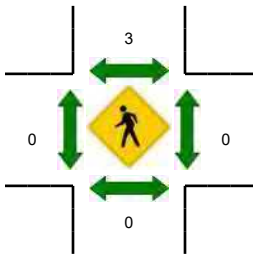
LOCATION: SW Pacific Hwy -- SW Elwert Rd/SW Sunset Blvd
CITY/STATE: Sherwood, OR

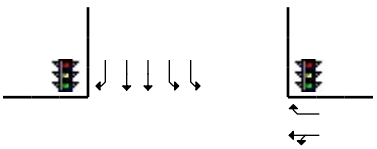
QC JOB #: 14401718
DATE: Thu, May 11 2017

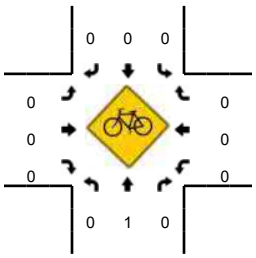


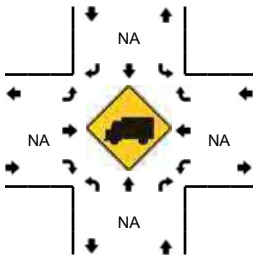
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

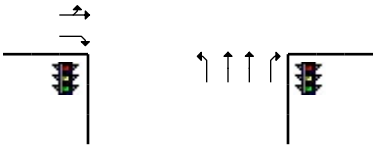


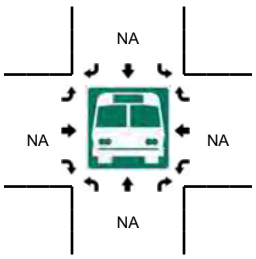












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Elwert Rd/SW Sunset Blvd (Eastbound)				SW Elwert Rd/SW Sunset Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	15	71	6	1	11	141	3	4	3	11	27	0	10	6	6	0	315	
4:05 PM	4	62	14	0	14	154	0	1	0	12	26	0	7	5	11	0	310	
4:10 PM	12	76	3	0	11	132	0	2	0	10	27	0	9	8	10	0	300	
4:15 PM	13	96	13	1	10	111	3	3	1	7	25	0	11	8	15	0	317	
4:20 PM	16	91	13	1	13	149	0	5	0	12	18	0	13	7	11	0	349	
4:25 PM	13	82	5	0	12	140	2	3	1	9	21	0	12	10	16	0	326	
4:30 PM	22	73	10	0	12	110	3	2	0	11	28	0	6	7	11	0	295	
4:35 PM	16	82	8	0	19	121	2	6	0	11	26	0	10	8	11	0	320	
4:40 PM	24	100	17	1	13	129	1	2	0	7	29	0	12	8	9	0	352	
4:45 PM	23	79	9	0	19	136	0	3	1	7	22	0	11	19	15	0	344	
4:50 PM	22	87	11	0	22	124	1	3	2	12	27	0	11	10	12	0	344	
4:55 PM	14	78	16	0	25	136	1	1	2	6	28	0	12	8	18	0	345	3917
5:00 PM	19	77	8	0	10	117	0	5	2	11	29	0	9	11	10	0	308	3910
5:05 PM	13	63	8	0	16	153	2	2	0	12	22	0	17	6	16	0	330	3930
5:10 PM	16	80	9	0	22	158	0	0	1	13	23	0	13	4	10	0	349	3979
5:15 PM	15	95	17	0	14	157	2	2	5	7	22	0	11	10	8	0	365	4027
5:20 PM	14	108	4	0	25	154	1	4	0	12	22	0	12	9	12	0	377	4055
5:25 PM	22	75	7	0	16	142	1	5	0	13	24	0	6	8	7	0	326	4055
5:30 PM	21	93	11	0	25	110	2	1	0	9	27	0	7	6	11	0	323	4083
5:35 PM	15	77	8	0	21	153	2	2	0	13	19	0	6	7	7	0	330	4093
5:40 PM	17	89	9	0	21	131	0	7	0	10	25	0	4	8	8	0	329	4070
5:45 PM	17	88	13	0	8	136	3	1	1	5	26	0	7	8	11	0	324	4050
5:50 PM	19	87	15	0	22	134	0	3	1	11	25	0	10	5	11	0	343	4049
5:55 PM	17	64	8	0	31	134	4	2	0	12	15	0	11	6	11	0	315	4019

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	180	1132	120	0	244	1876	12	24	24	128	268	0	144	92	120	0	4364
Heavy Trucks	8	40	4		0	20	0		4	0	8		8	0	0		92
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM

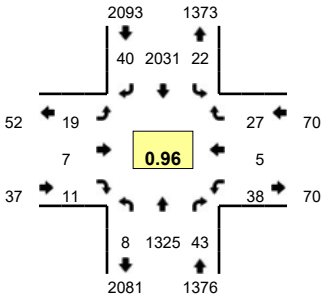
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

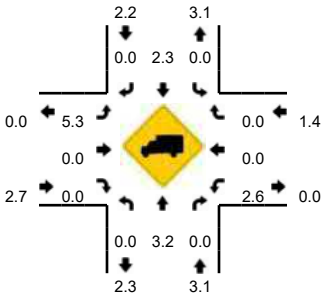
Method for determining peak hour: Total Entering Volume

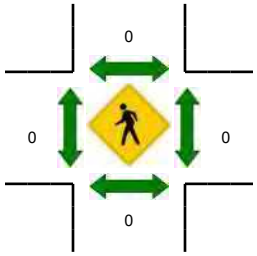
LOCATION: SW Pacific Hwy -- SW Chapman Rd
CITY/STATE: Sherwood, OR

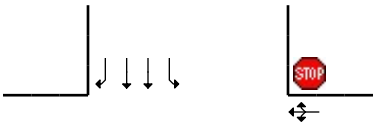
QC JOB #: 14401707
DATE: Thu, May 11 2017

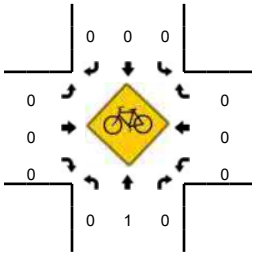


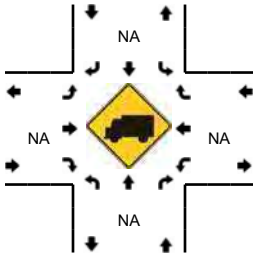
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

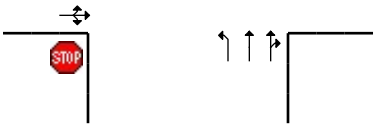


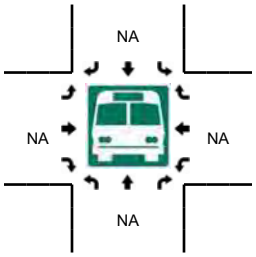












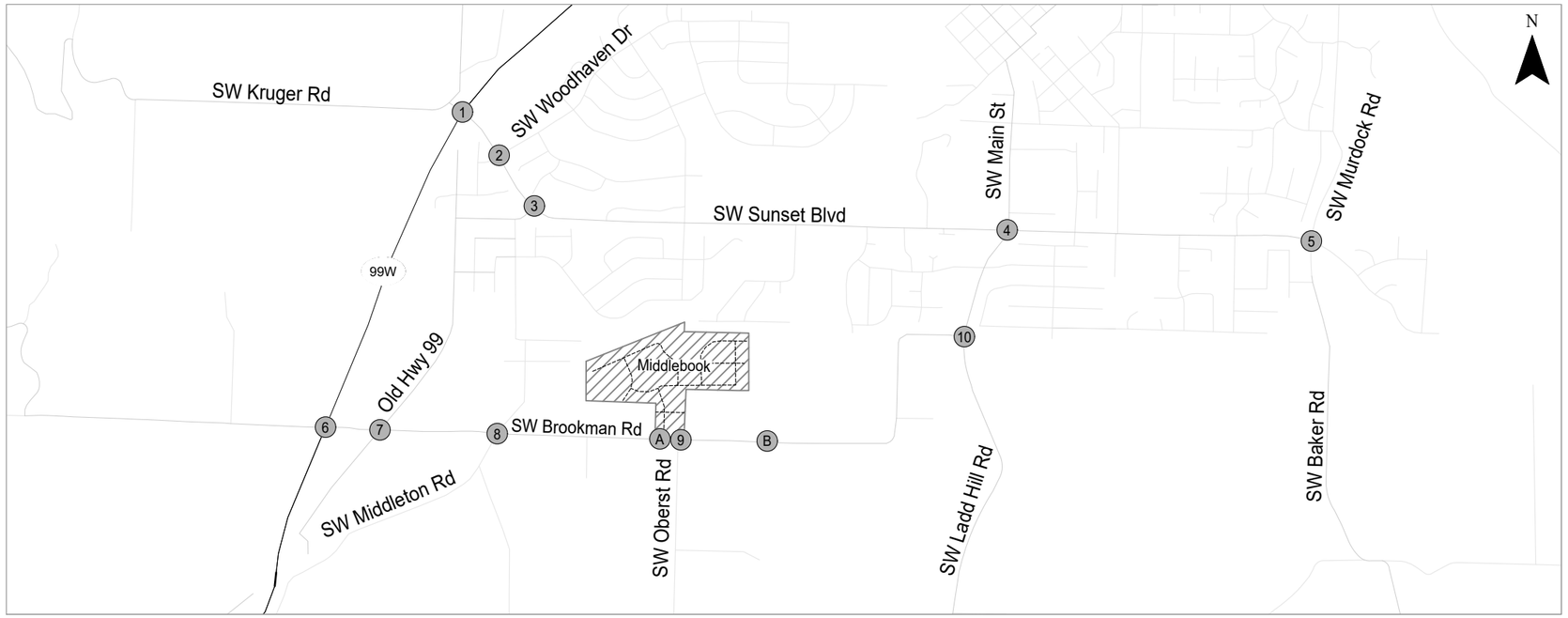
5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Chapman Rd (Eastbound)				SW Chapman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	89	1	0	1	184	2	0	1	1	0	0	2	0	0	0	281	
4:05 PM	0	72	6	1	0	166	3	0	0	0	1	0	5	0	0	0	254	
4:10 PM	1	103	2	1	1	160	1	0	1	0	1	0	3	0	1	0	275	
4:15 PM	0	126	4	0	1	163	4	0	4	0	0	0	4	0	2	0	308	
4:20 PM	0	124	1	0	1	153	1	0	1	0	0	0	4	0	0	0	285	
4:25 PM	1	92	5	0	1	172	4	0	1	0	0	0	4	0	2	0	282	
4:30 PM	1	102	2	0	3	149	0	0	0	0	0	0	4	0	2	0	263	
4:35 PM	2	114	0	0	1	153	3	0	2	2	0	0	1	0	4	0	282	
4:40 PM	0	117	2	0	3	149	4	0	5	1	3	0	6	0	4	0	294	
4:45 PM	0	108	2	0	0	176	3	0	3	1	1	0	3	0	5	0	302	
4:50 PM	0	117	5	0	2	177	4	0	0	1	1	0	4	1	1	0	313	
4:55 PM	2	121	3	0	1	173	5	0	0	0	1	0	1	0	3	0	310	3449
5:00 PM	0	102	6	0	4	159	1	1	0	0	2	0	3	0	1	0	279	3447
5:05 PM	0	91	2	0	2	183	3	0	1	0	1	0	0	1	0	0	284	3477
5:10 PM	0	110	6	0	4	187	2	1	4	0	0	0	5	0	1	0	320	3522
5:15 PM	2	119	3	0	1	189	5	0	0	1	1	0	2	1	1	0	325	3539
5:20 PM	1	107	1	1	0	161	3	0	2	0	0	0	6	0	5	0	287	3541
5:25 PM	0	114	6	0	2	177	5	0	1	0	1	0	4	0	0	0	310	3569
5:30 PM	0	105	7	0	0	147	2	0	1	1	0	0	3	2	2	0	270	3576
5:35 PM	0	100	0	0	1	164	2	1	1	0	1	0	4	1	2	0	277	3571
5:40 PM	0	132	4	0	0	156	2	0	1	0	1	0	0	0	1	0	297	3574
5:45 PM	0	114	4	0	0	149	1	0	4	0	0	0	5	0	2	0	279	3551
5:50 PM	0	93	3	0	3	158	1	0	0	4	0	0	5	1	1	0	269	3507
5:55 PM	0	82	3	0	2	151	0	0	1	2	0	0	5	0	1	0	247	3444

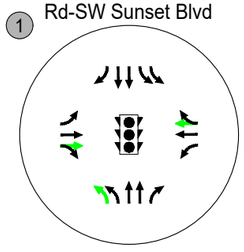
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	1344	40	4	20	2148	40	4	24	4	4	0	52	4	28	0	3728
Heavy Trucks	0	44	0		0	40	0		0	0	0		0	0	0		84
Pedestrians		0				0				0				0			0
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

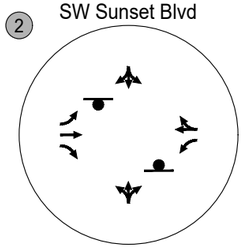
Comments:

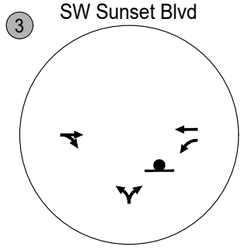
Report generated on 5/19/2017 4:01 PM

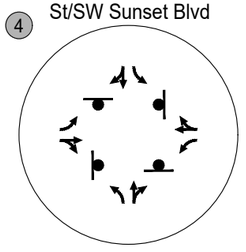
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

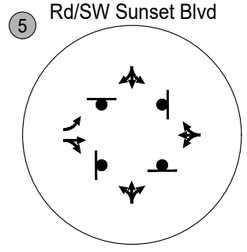


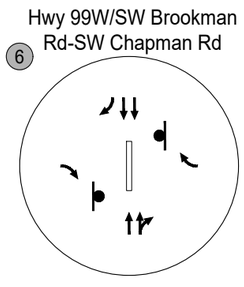


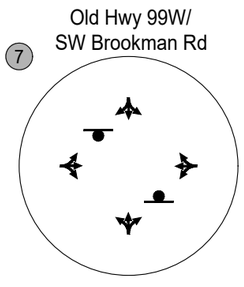


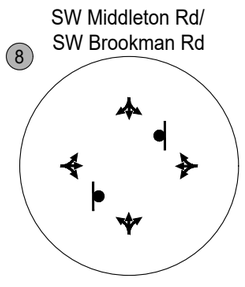


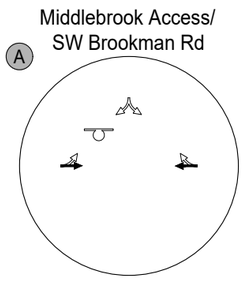


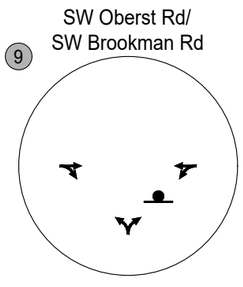


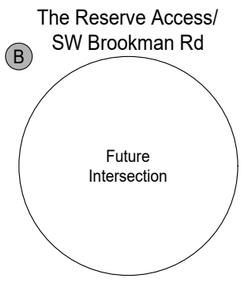


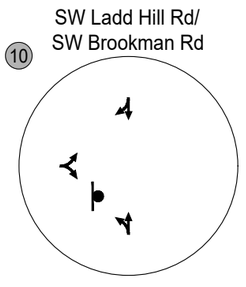










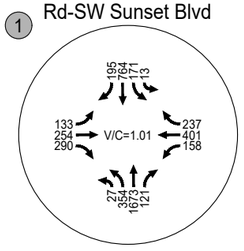


- STOP SIGN
- TRAFFIC SIGNAL
- RAISED MEDIAN
- EXISTING
- PLANNED IMPROVEMENT
- MOVEMENT/IMPROVEMENT ADDED WITH MIDDLEBROOK DEVELOPMENT

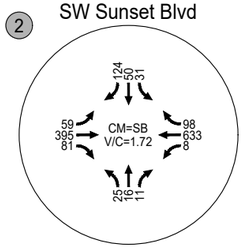
Year 2024 Background Assumed Lane Configurations and Traffic Control Devices
Sherwood, Oregon

Figure 6

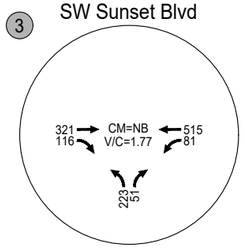
Hwy 99W/SW Elwert Rd-SW Sunset Blvd



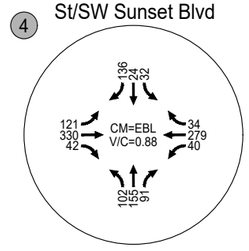
SW Woodhaven Dr/ SW Sunset Blvd



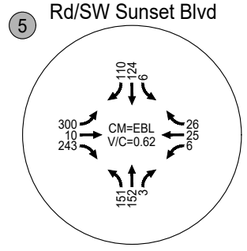
SW Timbrel Ln/ SW Sunset Blvd



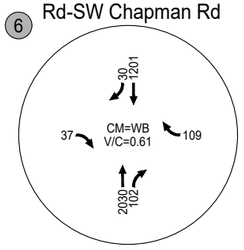
SW Ladd Hill Rd-SW Main St/SW Sunset Blvd



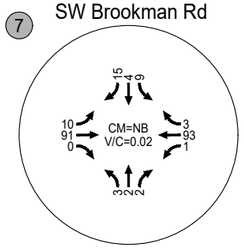
SW Baker Rd-SW Murdock Rd/SW Sunset Blvd



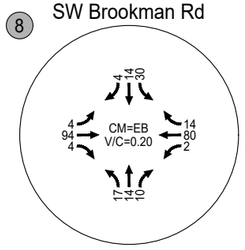
Hwy 99W/SW Brookman Rd-SW Chapman Rd



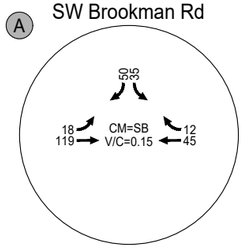
Old Hwy 99W/ SW Brookman Rd



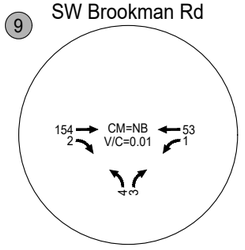
SW Middleton Rd/ SW Brookman Rd



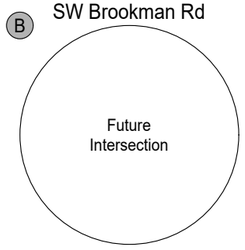
Middlebrook Access/ SW Brookman Rd



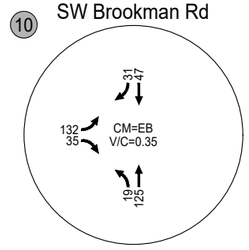
SW Oberst Rd/ SW Brookman Rd



The Reserve Access/ SW Brookman Rd



SW Ladd Hill Rd/ SW Brookman Rd

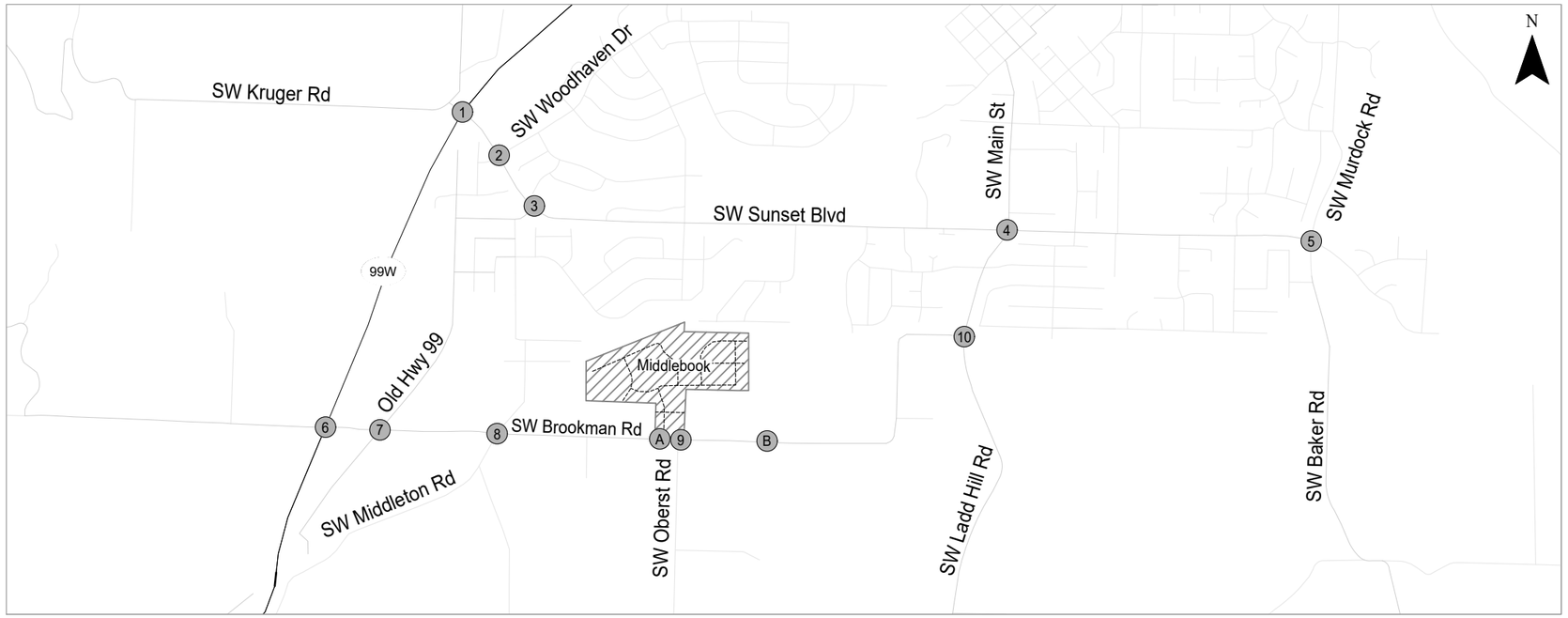


CM = CRITICAL MOVEMENT (TWSC)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
TWSC = TWO-WAY STOP CONTROL
AWSC= ALL-WAY STOP CONTROL

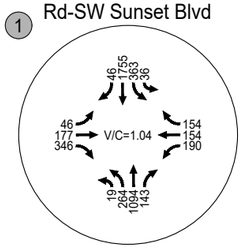
Year 2024 Background Intersection Operations Weekday AM Peak Hour Sherwood, Oregon

Figure 7

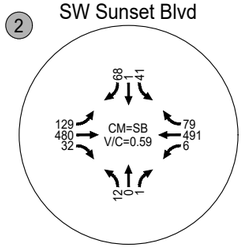
KITTELSON & ASSOCIATES



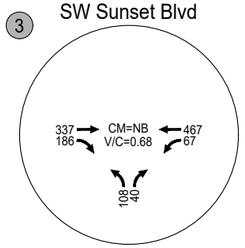
Hwy 99W/SW Elwert Rd-SW Sunset Blvd



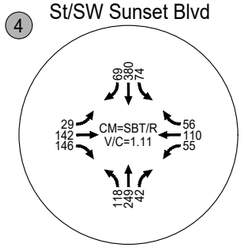
SW Woodhaven Dr/ SW Sunset Blvd



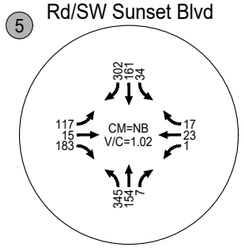
SW Timbrel Ln/ SW Sunset Blvd



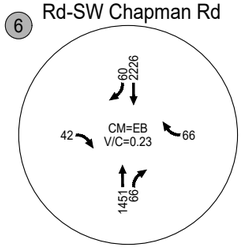
SW Ladd Hill Rd-SW Main St/SW Sunset Blvd



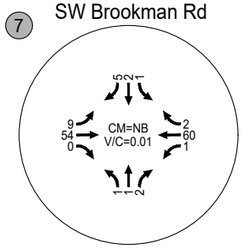
SW Baker Rd-SW Murdock Rd/SW Sunset Blvd



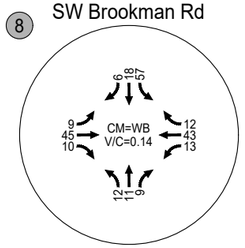
Hwy 99W/SW Brookman Rd-SW Chapman Rd



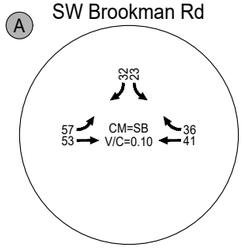
Old Hwy 99W/ SW Brookman Rd



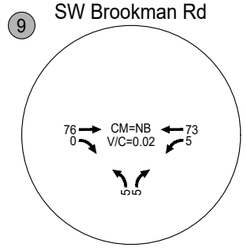
SW Middleton Rd/ SW Brookman Rd



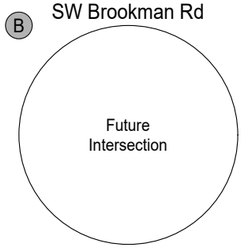
Middlebrook Access/ SW Brookman Rd



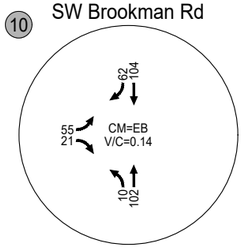
SW Oberst Rd/ SW Brookman Rd



The Reserve Access/ SW Brookman Rd



SW Ladd Hill Rd/ SW Brookman Rd



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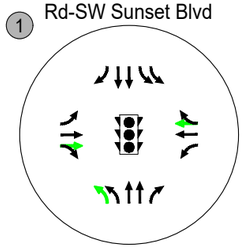
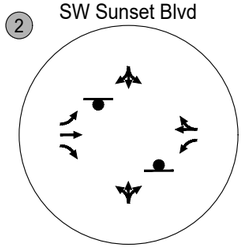
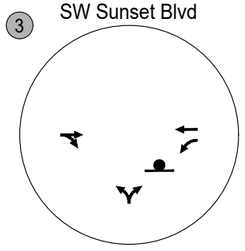
Year 2024 Background Intersection Operations Weekday PM Peak Hour Sherwood, Oregon

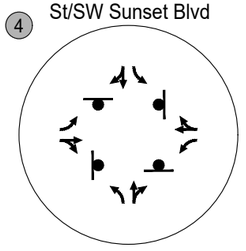
Figure 8

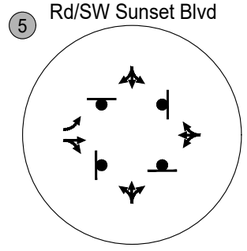
KITTELSON & ASSOCIATES

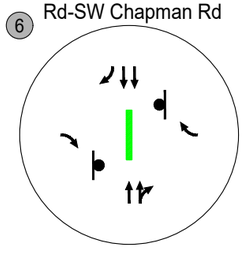


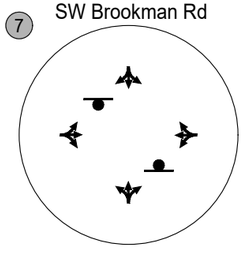


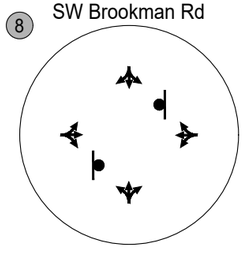


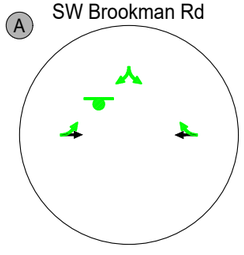


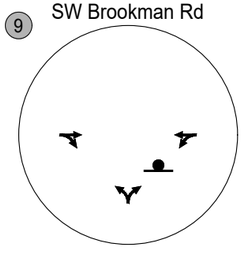


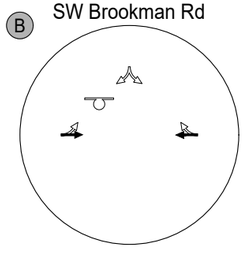


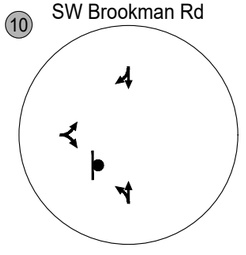










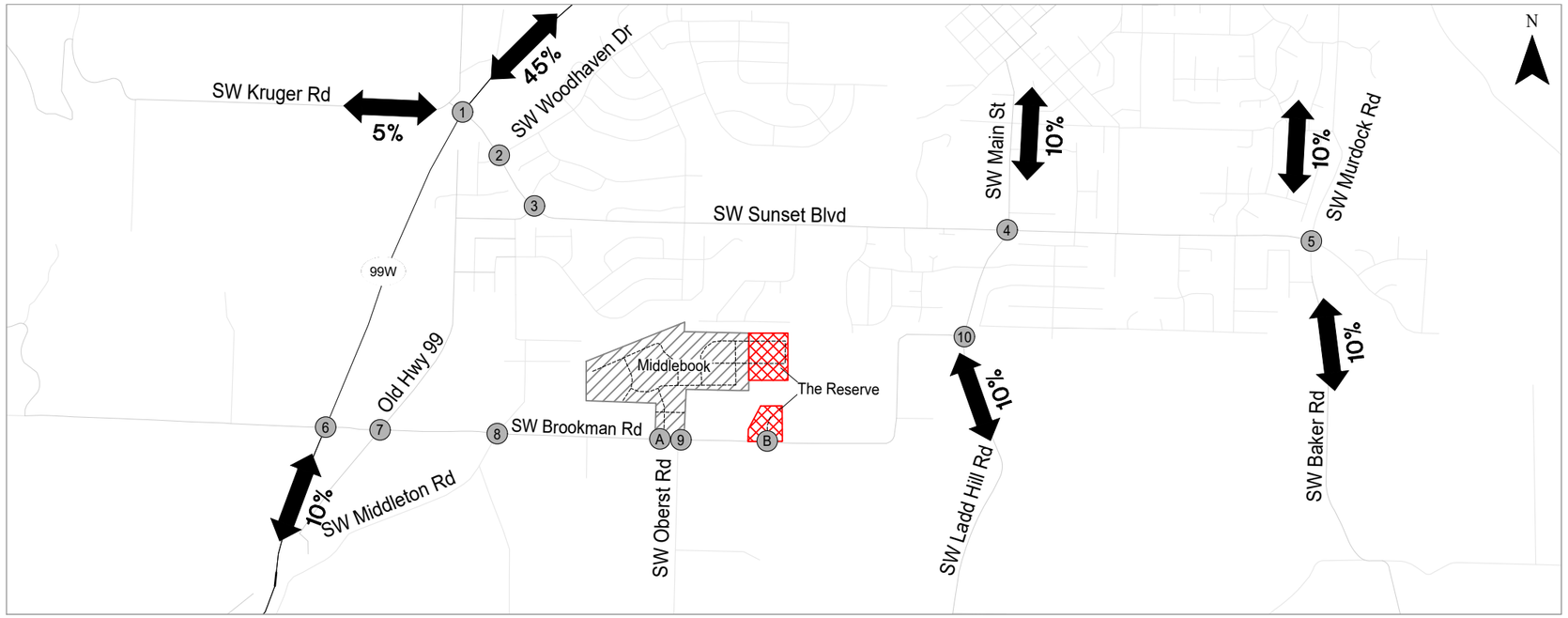


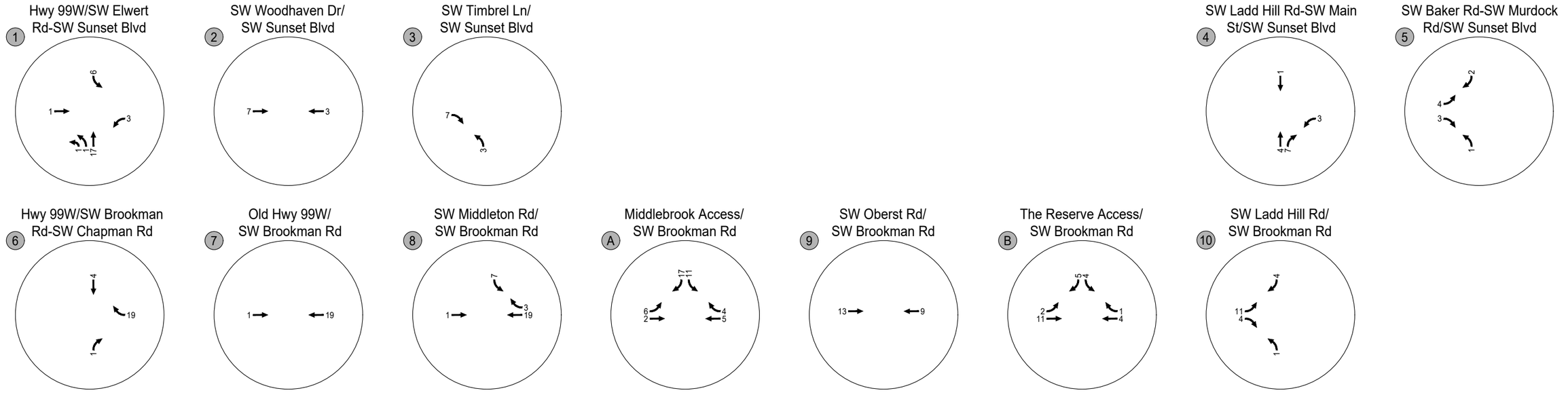
- STOP SIGN
- TRAFFIC SIGNAL
- RAISED MEDIAN
- EXISTING
- PLANNED IMPROVEMENT
- MOVEMENT ADDED WITH THE RESERVE DEVELOPMENT

Year 2024 Background Assumed Lane Configurations and Traffic Control Devices
Sherwood, Oregon

Figure 9

KITTELSON & ASSOCIATES





Assumed Trip Distribution and Assignment with RIRO at Highway 99W/SW Brookman Road-SW Chapman Road
Weekday AM Peak Hour
Sherwood, Oregon

Figure 10

KITTELSON & ASSOCIATES

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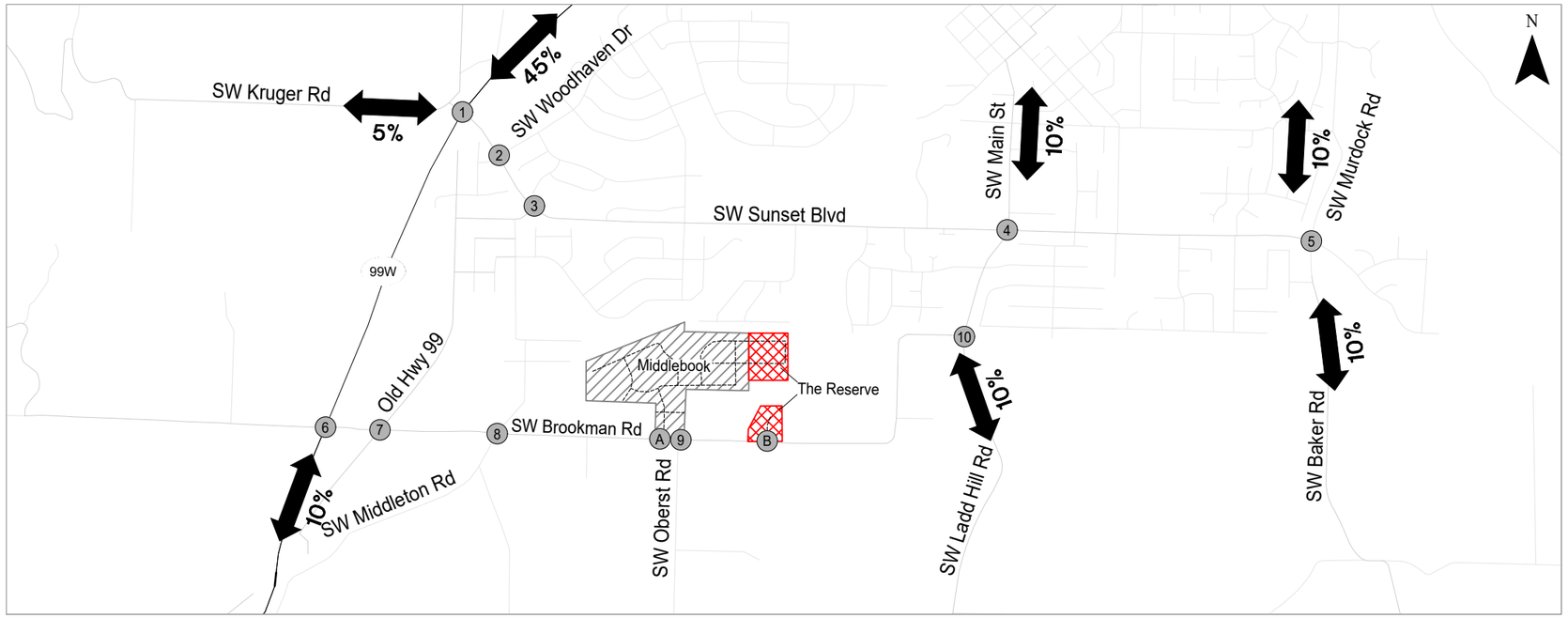
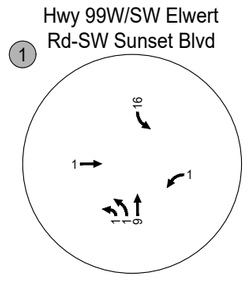
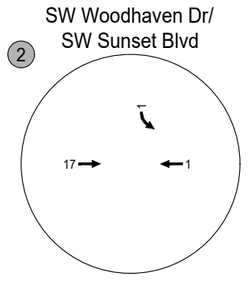
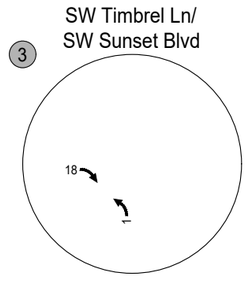
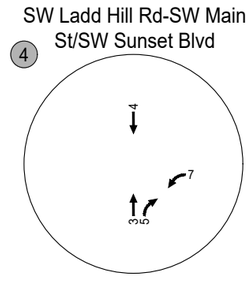
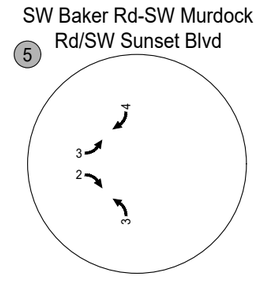


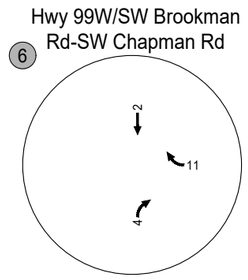


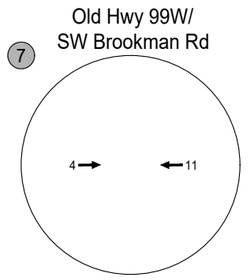


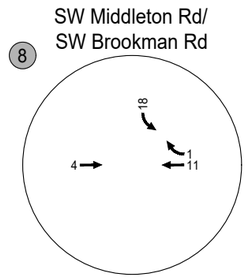


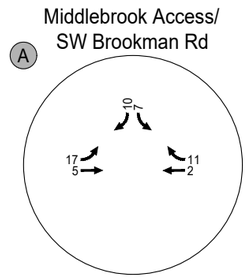


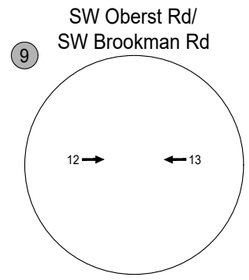


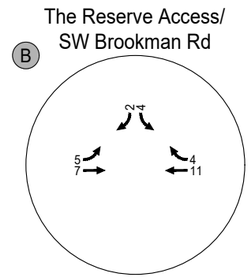


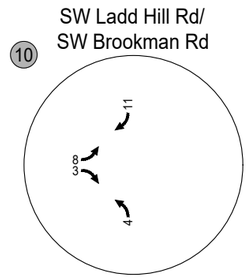






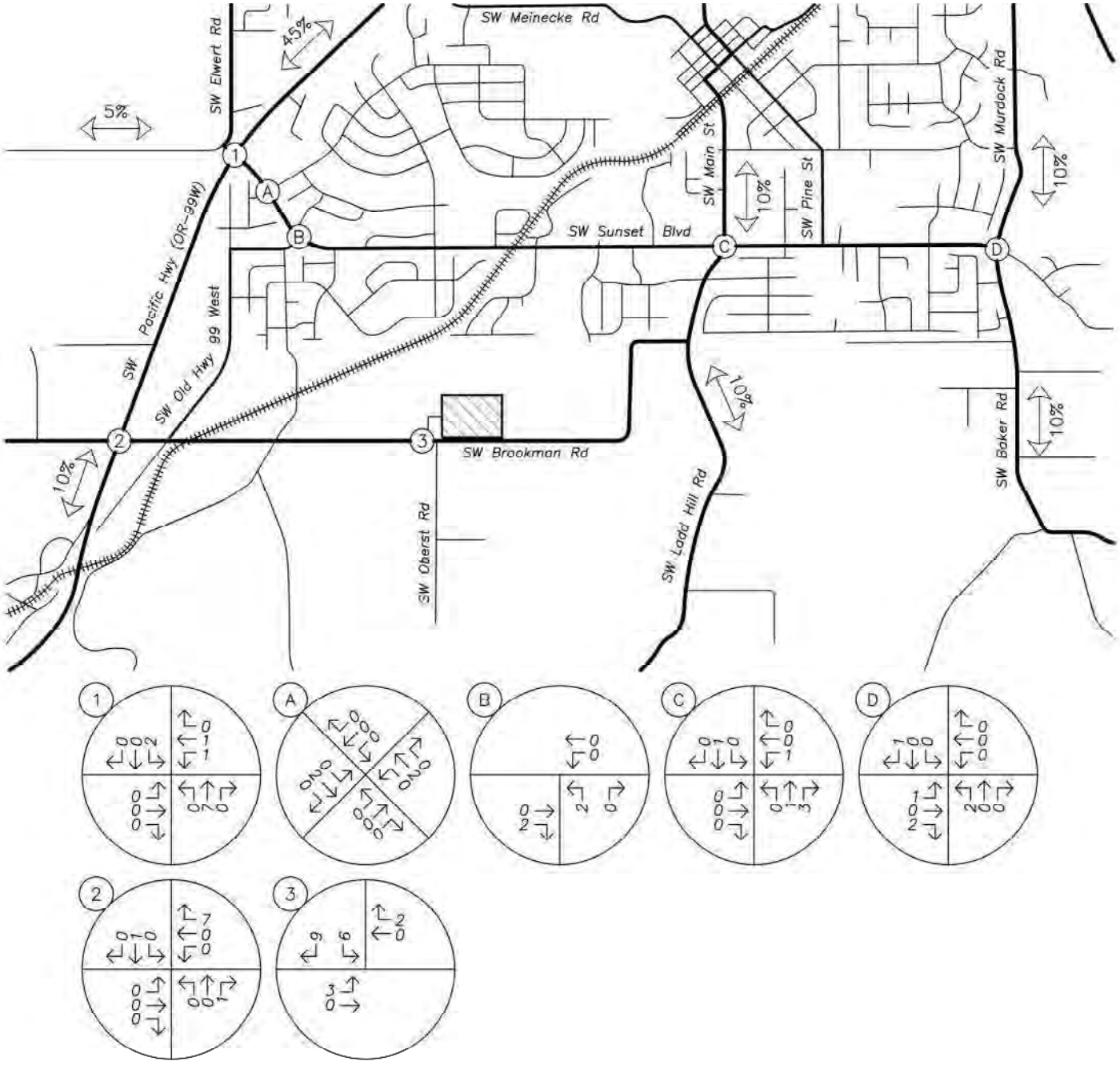






Assumed Trip Distribution and Assignment with RIRO at Highway 99W/SW Brookman Road-SW Chapman Road
Weekday PM Peak Hour
Sherwood, Oregon

Figure
11



no scale

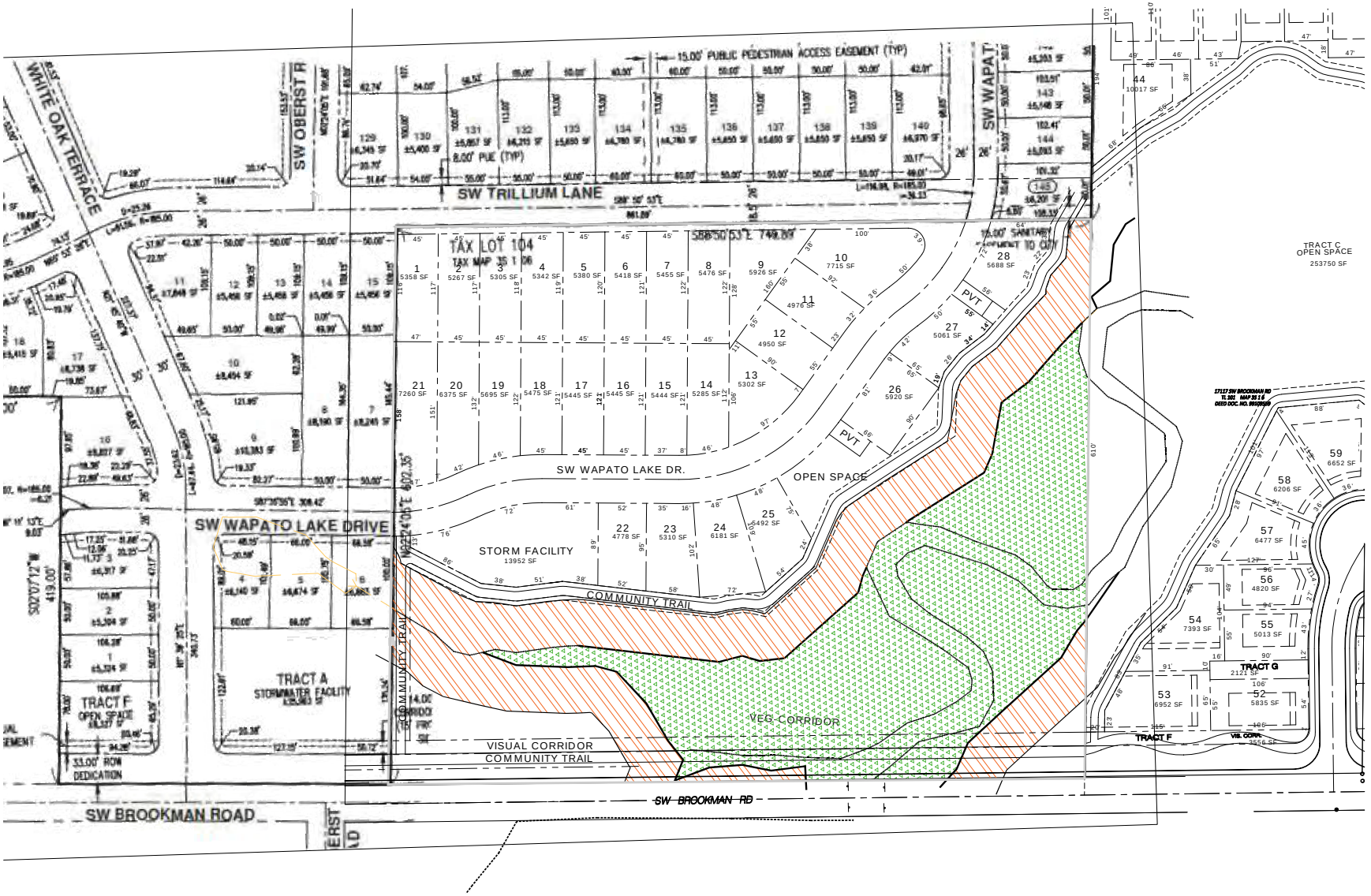
SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM Peak Hour

lancaster mobley

Figure 2
Cedar Creek Subdivision
3/31/2020

Exhibit A26



SCALE
50 0 25 50
1 INCH = 50 FEET

TVWD FILE #?????
WACO CASEFILE # ??-???-?

PIONEER DESIGN GROUP
BILLERICA, MA | BELLEVUE, WA | DENVER, COLORADO
PORTLAND, OREGON | HONOLULU, HAWAII
PH: 503.643.3636
WWW.PIONEERDESIGNGROUP.COM

PRELIMINARY SITE PLAN

SCOTT PROPERTY
CITY OF SHERWOOD, OREGON

Designed by MLS Date 10/29
Drawn by TCC Date 10/29
Reviewed by MLS Date 10/29
Project No. 131-999 REF.
Horiz. Scale: 1"=50'
Vert. Scale:

No. Revision By Date

Project SCOTT PROPERTY
No. 131-999
Type PLANNING
Sheet P0.0

B:\Projects\131-999\Brookman Road\Scott Property\P2.dwg 10/10/2019 3:58:51 PM

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 16.55 to 16.75 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

1 - 4 of 63 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U G	M J / N H	S / I V	C / L	W / O / R / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02154	N	N	N	N	N	N	N	05/01/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY							WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	NONE	N	DRY	REAR		PRVTE	NE-SW									000		00
N							5P	PORTLAND UA	16.57		SW ELWERT RD	03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		043	000		07
N							45 21 16.15	-122 51 59.28			009100100S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW								011		00
																				PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		000	000		00
																											OR<25					
08211	N	N	N	N				11/30/2016	WASHINGTON	1 14			STRGHT		N	N	RAIN	S-1STOP	01	NONE 9	STRGHT											29
NONE							WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		N/A	NE-SW									000		00
N							3P	PORTLAND UA	16.60		SW SUNSET BLVD	03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 14.96	-122 52 .91			009100100S00		(04)													UNK					
																			02	NONE 9	STOP											
																				N/A	NE-SW								011		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
04096	N	N	N	N	N	N		08/12/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY							MO	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000		00
N							4P	PORTLAND UA	16.60		SW ELWERT RD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		043	000		07
N							45 21 14.96	-122 52 .91			009100100S00		(04)													OR>25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW								011		00
																				PSNGR CAR		01	DRVR	INJC	36	F	OR-Y		000	000		00
																											OR<25					
07960	N	N	N	N				12/22/2015	WASHINGTON	1 14			STRGHT		N	N	RAIN	S-1STOP	01	NONE 1	STRGHT											29
NO RPT							TU	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	NE-SW									000		00
N							4P	PORTLAND UA	16.61		SW ELWERT RD	04			N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	72	M	OR-Y		026	000		29
N							45 21 14.53	-122 52 1.4			009100100S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW								011		00
																				PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP											
																				PRVTE	NE-SW								011		00
																				PSNGR CAR		02	PSNG	INJC	65	M			000	000		00
03457	N	N	N	N				06/21/2015	WASHINGTON	1 14			STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE							SU	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000		00
N							6P	PORTLAND UA	16.64		SW SUNSET BLVD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		042	000		29
N							45 21 13.21	-122 52 2.83			009100100S00		(04)													OR>25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J G N	S H V	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	INJC	18	F	OR-Y OR<25		000	006 000		00 00
04458 NONE	N	N	N N	N		08/06/2015 TH 6P 45 21 13.21	WASHINGTON SHERWOOD PORTLAND UA -122 52 2.83	1 14 MN 0 16.64	SW PACIFIC HY 99W SW SUNSET BLVD 009100100S00	STRGHT NE 04	(DIVMD) (04)	N UNKNOWN INJ	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	F	UNK UNK		026	000 000		29 00 29
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	30	F	OR-Y OR<25		000	011 000		00 00
03929 NONE	N	N	N N	N		06/15/2016 WE 3P 45 21 13.21	WASHINGTON SHERWOOD PORTLAND UA -122 52 2.83	1 14 MN 0 16.64	SW PACIFIC HY 99W SW ELWERT RD 009100100S00	STRGHT NE 04	(DIVMD) (04)	N UNKNOWN PDO	N N N	CLR DRY DAY	S-STRGHT SS-O PDO	01	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		13 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00
03493 NONE	N	N	N N	N		05/28/2016 SA 11A 45 21 12.76	WASHINGTON SHERWOOD PORTLAND UA -122 52 3.29	1 14 MN 0 16.65	SW PACIFIC HY 99W SW SUNSET BLVD 009100100S00	STRGHT NE 03	(DIVMD) (04)	Y UNKNOWN PDO	N N N	CLR DRY DAY	S-STRGHT REAR PDO	01	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		29 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00
80504 NONE	N	N	N N	N		05/17/2018 TH 4P 45 21 12.75	WASHINGTON SHERWOOD PORTLAND UA -122 52 3.29	1 14 MN 0 16.65	SW PACIFIC HY 99W SW SUNSET BLVD 009100100S00	STRGHT NE 03	(DIVMD) (04)	Y UNKNOWN INJ	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	46	M	OR-Y OR<25		026	000 000		29 00 29
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	32	M	OR-Y OR<25		000	011 000		00 00
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	02	PSNG	INJC	31	M			000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D M R / U G S	J / I / N / V	S / C / H / L	W / O / R / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP / PNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
80239	N N N N						03/09/2015	WASHINGTON	1	14		STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE							MO	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW								000		00
N							3P	PORTLAND UA	16.65		SW SUNSET BLVD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		026	000		29
N							45 21 12.76	-122 52 3.29			009100100S00		(04)													OR<25				
																		02	NONE 0	STOP										
																			PRVTE	NE-SW								011		00
																			PSNGR CAR		01	DRVR	INJC	60	F	OR-Y		000	000		00
																										OR<25				
00684	N N N N N N						02/08/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
CITY							TH	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		UNKN	NE-SW								000		00
N							6P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		026	000		29
N							45 21 11.85	-122 52 4.18			009100100S00															UNK				
																		02	NONE 0	STOP										
																			PRVTE	NE-SW								011		00
																			PSNGR CAR		01	DRVR	INJC	49	F	OR-Y		000	000		00
																										OR<25				
02155	N N N N N N						04/30/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT										07
CITY							MO	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW								000		00
N							5P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00															UNK				
																		02	NONE 9	STOP										
																			N/A	NE-SW								011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
07290	N N N N						12/19/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT										07
CITY							WE	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW								000		00
N							4P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00															UNK				
																		02	NONE 9	STOP										
																			N/A	NE-SW								011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
00764	N N N N						02/13/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							WE	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW								000		00
N							2P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00															UNK				
																		02	NONE 9	STOP										
																			N/A	NE-SW								011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U G	M J / N V	S / H L	W / O / R / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04035	N	N	N	N	N	N	08/08/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	TURN-L										29
CITY				TH			SHERWOOD		MN 0		SW ELWERT RD	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NW								000		00
N				3P			PORTLAND UA		16.67		SW PACIFIC HY 99W	05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		026	000		29
N				45 21 11.85			-122 52 4.18				009100100S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NW								011		00
																			PSNGR CAR		01	DRVR	INJC	38	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NW								011		00
																			PSNGR CAR		02	PSNG	INJB	43	F			000	000		00
05867	N	N	N	N			10/28/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-STP	01	NONE 9	TURN-R										08
NONE				SU			SHERWOOD		MN 0		SW ELWERT RD	NW		TRF SIGNAL	N	WET	TURN		N/A	NW-SE								000		00
N				UNK			PORTLAND UA		16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 21 11.85			-122 52 4.18				009100100S00															UNK					
																		02	NONE 9	STOP										
																			N/A	NW-SE								012		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
00404	N	N	N	N	N	N	01/23/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
COUNTY				FR					MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S								000		00
N				6A			PORTLAND UA		16.67			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		020	000		04
N				45 21 11.85			-122 52 4.18				009100100S00															OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	S -W								000		00
																			PSNGR CAR		01	DRVR	INJC	29	M	OR-Y		000	000		00
																										OR>25					
03342	N	N	N	N	N	N	06/06/2017	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										087	27,04
CITY				TU					MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -W								000		00
N				2P			PORTLAND UA		16.67			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	21	M	OR-Y		016,004,020	038		27,04
N				45 21 11.85			-122 52 4.18				009100100S00															OR>25					
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		01	DRVR	INJC	25	F	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		02	PSNG	NO<5	01	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		03	PSNG	NO<5	02	F			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P / E / L / D	A	D R / U / G / C	M J / N / N / S	S / H / V	W / R / L	O / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02588	N	N	N	N N	N	N		05/23/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											04
CITY							WE	SHERWOOD	MN	0	SW ELWERT RD	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	NE-SW									000		00
N							5A	PORTLAND UA	16.67		SW PACIFIC HY 99W	01	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00																OR<25					
																				02	NONE 0	TURN-L										
																					PRVTE	SW-NW								000		00
																					PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		020	000		04
																												OR<25					
05940	N	N	N	N N	N	N		11/03/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT										013	02,29
CITY							SA	SHERWOOD	MN	0	SW ELWERT RD	CN		L-GRN-SIG	N	WET	TURN		PRVTE	NE-SW									022	013	00
N							8P	PORTLAND UA	16.67		SW PACIFIC HY 99W	01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	55	F	SUSP		000	000		00
N							45 21 11.84	-122 52 4.18			009100100S00																OR<25					
																				02	NONE 0	TURN-L										
																					PRVTE	SW-NW								022		00
																					TRUCK		01	DRVR	NONE	35	M	OR-Y		004,028	000		02
																												OR<25					
																				03	NONE 0	STRGHT										
																					PRVTE	NE-SW								000		00
																					PSNGR CAR		01	DRVR	NONE	24	F	SUSP		026	000		29
																												N-RES					
06954	N	N	N	N N	N	N		12/18/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	TURN-L											04
CITY							TU		MN	0		CN		L-GRN-SIG	N	WET	TURN		PRVTE	SW-NW									000		00
N							2P	PORTLAND UA	16.67			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	22	F	OR-Y		020,004	000		04
N							45 21 11.85	-122 52 4.19			009100100S00																OR<25					
																				02	NONE 0	STRGHT										
																					PRVTE	NE-SW								000		00
																					PSNGR CAR		01	DRVR	INJB	56	F	OR-Y		000	000		00
																												OR<25					
05733	N	N	N	N N	N	N		10/26/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 9	STRGHT											04
CITY							FR	SHERWOOD	MN	0	SW ELWERT RD	CN		TRF SIGNAL	N	WET	TURN		N/A	NE-SW									000		00
N							1P	PORTLAND UA	16.67		SW PACIFIC HY 99W	01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00																UNK					
																				02	NONE 9	TURN-L										
																					N/A	SW-NW								000		00
																					PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																												UNK					
03825	N	N	N	N				07/08/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	BIKE	01	NONE 0	TURN-L											02
NONE							WE		MN	0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SE-SW									000		00
N							7P	PORTLAND UA	16.67			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	F	OTH-Y		027	000		02
N							45 21 11.85	-122 52 4.18			009100100S00																OR<25					
																					-											
																					STRGHT		01	BIKE	INJB	23	M		I INRD	000	035		00
																					NW SE											

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	C O R K	W N	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03238	N	N	N	N	N	N	N	06/25/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										010	04
CITY								MO	SHERWOOD	MN 0		SW ELWERT RD	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	NE-SW								000	010	00
N								2P	PORTLAND UA	16.67		SW PACIFIC HY 99W	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	18	F	OR-Y		020	000		04
N								45 21 11.85	-122 52 4.18			009100100S00															OR<25					
																			02	NONE 0	STRGHT											
																				PRVTE	NW-SE								000		00
																				PSNGR CAR		01	DRVR	NONE	69	M	OR-Y		000	000		00
																											OR<25					
03471	Y	Y	N	N	N	N	N	06/22/2015	WASHINGTON	1	14		STRGHT		N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT										079,010	01
CITY								MO		MN 0		Not Related to Intersection	UN	(DIVMD)	UNKNOWN	N	DRY	FIX		PRVTE	NE-SW								000	079,010	00
Y								2A	PORTLAND UA	16.68			01			N	DARK	INJ		MTRCYCLE		01	DRVR	INJA	44	M	OR-Y		047,080,081	000		01
N								45 21 11.41	-122 52 4.6			009100100S00		(04)													OR<25					
03619	N	N	N	N				07/05/2018	WASHINGTON	1	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											29
NONE								TH		MN 0			UN	(NONE)	UNKNOWN	N	DRY	REAR		N/A	NE-SW								000		00
N								6P	PORTLAND UA	16.73			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 9.15	-122 52 6.49			009100100S00		(02)													UNK					
																			02	NONE 9	STRGHT											
																				N/A	NE-SW								006		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
05208	N	N	N	N				10/03/2018	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE								WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	SW-NE								000		00
N								6A	PORTLAND UA	16.55		SW SUNSET BLVD	00			N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		026	000		29
N								45 21 15.95	-122 51 58.08			009100200S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJB	36	F	OR-Y		000	000		00
																											OR<25					
01494	N	N	N	N				03/17/2017	WASHINGTON	2	14		STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE								FR	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	SW-NE								000		00
N								6A	PORTLAND UA	16.57		SW SUNSET BLVD	04			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		026	000		29
N								45 21 15.23	-122 51 59.17			009100200S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP											
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		02	PSNG	INJC	24	F			000	000		00
																			02	NONE 0	STOP											
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		03	PSNG	NO<5	03	M			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R E A	M J U G	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE	MOVE / OWNER / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES / LOC	PED	ERROR	ACT	EVENT	CAUSE
04491	N	N	N	N			04/13/2016	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000	00
N							5P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.45	-122 52 3.31			009100200S00															UNK					
																		02	NONE 9	STOP										
																			N/A	NE-SW									011	00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
04670	N	N	N	N	N	N	07/31/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										07
CITY							MO	SHERWOOD	MN 0		SW ELWERT RD	NE		UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000	00
N							4P	PORTLAND UA	16.66		SW PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	16	M	OR-Y		043	000		07
N							45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																		01	NONE 0	STRGHT										
																			PRVTE	NE-SW									000	00
																			PSNGR CAR		02	PSNG	INJC	18	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	NE-SW									006	00
																			PSNGR CAR		01	DRVR	INJC	18	F	OR-Y		000	000		00
																										OR<25				
04289	N	N	N	N			04/27/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							TH	SHERWOOD	MN 0		SW PACIFIC HY 99W	E		TRF SIGNAL	N	DRY	REAR		N/A	SE-NW									000	00
N							7A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.45	-122 52 3.31			009100200S00															UNK					
																		02	NONE 9	STOP										
																			N/A	SE-NW									013	00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
04990	N	N	N	N	N	N	07/21/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY							TU	SHERWOOD	MN 0		SW ELWERT RD	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE									000	00
N							4P	PORTLAND UA	16.66		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	29	F	SUSP		043	000		07
N							45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011	00
																			PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		000	000		00
																										OR<25				
05463	N	N	N	N			09/04/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE							FR	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE									000	00
N							11A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		026	000		29
N							45 21 11.45	-122 52 3.31			009100200S00															OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J N V	S I H L	C N K	W O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																											OR<25					
01834	Y	Y	N	N	N	N	N	03/19/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										013	07,30
CITY								SA	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								6P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	NONE		043,050	000		07,30
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								012	013	00
																				PSNGR CAR		01	DRVR	INJC	46	M	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								012	013	00
																				PSNGR CAR		02	PSNG	INJC	28	F			000	000		00
																			03	NONE 0	STOP										
																				PRVTE	SW-NE								022		00
																				PSNGR CAR		01	DRVR	NONE	34	M	OR-Y		000	000		00
																											OR<25					
02965	N	N	N	N				05/06/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE								FR	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								8A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		026	000		29
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJC	40	M	OR-Y		000	000		00
																											OR<25					
06420	N	N	N	N	N	N	N	09/22/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	S-STRGHT	01	NONE 0	STRGHT										087	07
CITY								TH	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	SNO	REAR		PRVTE	SW-NE								000	087	00
N								5P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y		043	000		07
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STRGHT										
																				PRVTE	SW-NE								006	087	00
																				PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		000	000		00
																											OR<25					
08928	N	N	N	N				12/25/2016	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE								SU	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								12P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y		026	000		29
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJC	59	F	OR-Y		000	000		00
																											OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U N V	S I H L	W C O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		02	PSNG	INJC	40	M			000	000		00
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		03	PSNG	INJC	54	M			000	000		00
07321	N	N	N	N	N	N	11/18/2017	WASHINGTON	2 14		INTER	CROSS	N	N	FOG	S-STRGHT	01	NONE 9	STRGHT											07
CITY			SA				SHERWOOD		MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		N/A	SW-NE									000		00
N			8P				PORTLAND UA		16.66	SW SUNSET BLVD	06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 21 11.45				-122 52 3.31			009100200S00															UNK					
																	02	NONE 9	STRGHT										
																		N/A	SW-NE									006		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
01690	N	N	N	N	N	N	04/04/2019	WASHINGTON	2 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07
CITY			TH				SHERWOOD		MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			7A				PORTLAND UA		16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		043	000		07
N			45 21 11.45				-122 52 3.31			009100200S00															OR<25					
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		000	000		00
																									OR<25					
03081	N	N	N	N	N	N	06/16/2019	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
CITY			SU				SHERWOOD		MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE									000		00
N			3P				PORTLAND UA		16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		026	000		29
N			45 21 11.45				-122 52 3.31			009100200S00															OR<25					
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		01	DRVR	NONE	43	F	OR-Y		000	000		00
																									OR>25					
01913	N	N	N	N			04/16/2019	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT			TU				SHERWOOD		MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		UNKN	SW-NE									000		00
N			4P				PORTLAND UA		16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000		29
N			45 21 11.45				-122 52 3.31			009100200S00															UNK					
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		01	DRVR	INJC	28	M	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		02	PSNG	INJC	29	M			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U N V	S I H L	C N L	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02665	N	N	N	N	N	N	N	05/25/2019	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											27,29
CITY			SA						SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			4P						PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	21	M	OR-Y		016,026	038		27,29
N			45 21 11.45						-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP											
																				RENTL	SW-NE									011		00
																				PSNGR CAR		01	DRVR	INJC	30	F	OTH-Y		000	000		00
																											N-RES					
																			02	NONE 0	STOP											
																				RENTL	SW-NE									011		00
																				PSNGR CAR		02	PSNG	INJC	36	M			000	000		00
																			02	NONE 0	STOP											
																				RENTL	SW-NE									011		00
																				PSNGR CAR		03	PSNG	INJC	21	M			000	000		00
06006	N	N	N	N		Y		11/15/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											10
CITY			FR						SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			6A						PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		000	000		00
N			45 21 11.45						-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP											
																				PRVTE	SW-NE									011		00
																				PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		009	000		10
																											OR<25					
06647	N	N	N	N		Y		12/14/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											27,07
CITY			SA						SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			1P						PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	F	SUSP		016,043	038		27,07
N			45 21 11.45						-122 52 3.31			009100200S00															UNK					
																			02	NONE 0	STOP											
																				PRVTE	SW-NE									011		00
																				PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP											
																				PRVTE	SW-NE									011		00
																				PSNGR CAR		02	PSNG	INJC	63	M			000	000		00
04827	N	N	N	N	N	N	N	08/24/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY			MO						SHERWOOD	MN 0		SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW-NE									000		00
N			1P						PORTLAND UA	16.66		SW SUNSET BLVD	02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	93	F	OR-Y		020	000		04
N			45 21 11.45						-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	TURN-L											
																				PRVTE	SE-SW									000		00
																				PSNGR CAR		01	DRVR	INJB	35	F	OR-Y		000	000		00
																											OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	C O R K	W DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH COLL SVRTY	V#	SPCL USE / OWNER / TRLR QTY / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0	TURN-L										
																	PRVTE	SE-SW									000		00
																	PSNGR CAR		02	PSNG	INJC	05	M			000	000		00
05220	N	N	N	N	N	N	10/03/2018	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04,27
CITY							WE	SHERWOOD	MN 0	SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SE-NW								000		00
N							11A	PORTLAND UA	16.66	SW SUNSET BLVD	02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		000	000		00
N							45 21 11.45	-122 52 3.31		009100200S00															OR<25					
																01	NONE 0	STRGHT										
																	PRVTE	SE-NW									000		00
																	PSNGR CAR		02	PSNG	INJC	24	F			000	000		00
																02	NONE 0	STRGHT										
																	PRVTE	SW-NE									000		00
																	PSNGR CAR		01	DRVR	INJC	55	M	OTH-Y N-RES		020,016	038		04,27
06861	N	N	N	N	N	N	10/30/2017	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										04
CITY							MO	SHERWOOD	MN 0	SW ELWERT RD	CN		TRF SIGNAL	N	DRY	TURN		N/A	SE-SW								000		00
N							6A	PORTLAND UA	16.66	SW PACIFIC HY 99W	03	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.45	-122 52 3.31		009100200S00															UNK					
																02	NONE 9	STRGHT										
																	N/A	NW-SE									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
05152	N	N	N	N	N	N	08/23/2017	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY							WE	SHERWOOD	MN 0	SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SW-NE								000		00
N							12P	PORTLAND UA	16.66	SW SUNSET BLVD	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	59	M	EXP	020	000	04		
N							45 21 11.45	-122 52 3.31		009100200S00															OR<25					
																02	NONE 0	STRGHT										
																	PRVTE	NW-SE									000		00
																	PSNGR CAR		01	DRVR	INJC	36	F	OR-Y OR<25	000	000	000		00
																03	NONE 0	TURN-R										
																	PRVTE	SE-NE									022		00
																	PSNGR CAR		01	DRVR	INJC	19	F	OR-Y OR<25	000	000	000		00
02603	N	N	N	N	N	N	05/13/2015	WASHINGTON	2 14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
CITY							WE		MN 0		UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N							7A	PORTLAND UA	16.68		03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	48	F	OR-Y	043	000	07		
N							45 21 10.55	-122 52 4.06		009100200S00		(04)													OR<25					
																02	NONE 0	STOP										
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	INJC	45	F	OR-Y OR<25	000	000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	W C O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06998	N	Y	N	N	N	12/20/2018	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
CITY						TH		MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N									000		00
N						5P	PORTLAND UA	16.68			04			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		043	000		07
N						45 21 10.56	-122 52 4.05			009100200S00		(04)													OR<25					
																	02	NONE 0	STOP									011		00
																		PRVTE	S -N											
																		PSNGR CAR		01	DRVR	INJC	30	M	OTH-Y		000	000		00
																									N-RES					
04365	N	N	N	N	N	08/02/2015	WASHINGTON	2	14		STRGHT		N	N	CLD	S-1STOP	01	NONE 0	STRGHT										33
CITY						SU		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	S -N								000		00
N						9P	PORTLAND UA	16.69			03			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	38	F	SUSP		051,026	000		33
N						45 21 10.11	-122 52 4.43			009100200S00		(04)													OR<25					
																	02	NONE 0	STOP									011		00
																		PRVTE	S -N											
																		PSNGR CAR		01	DRVR	INJB	60	F	OTH-Y		000	000		00
																									N-RES					
06659	N	N	N	N	N	11/06/2015	WASHINGTON	2	14		STRGHT		Y	N	FOG	S-1STOP	01	NONE 0	STRGHT										07
CITY						FR		MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N						7A	PORTLAND UA	16.69			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		043,026	000		07
N						45 21 10.11	-122 52 4.43			009100200S00		(02)													OR<25					
																	02	NONE 0	STOP									011		00
																		PRVTE	S -N											
																		PSNGR CAR		01	DRVR	NONE	31	F	OR-Y		000	000		00
																									OR<25					
08008	N	N	N	N	N	12/14/2017	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										087	29
CITY						TH		MN 0			UN	(DIVMD)	TRF SIGNAL	N	DRY	REAR		PRVTE	S -N								000	087	00
N						1P	PORTLAND UA	16.69			03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	68	M	OR-Y		042	000		29
N						45 21 10.11	-122 52 4.43			009100200S00		(04)													OR<25					
																	02	NONE 0	STRGHT									006	087	00
																		PRVTE	S -N											
																		PSNGR CAR		01	DRVR	NONE	68	F	OR-Y		000	000		00
																									OR<25					
04297	N	Y	N	N	N	08/24/2019	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										07
CITY						SA		MN 0			UN	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	S -N								000		00
N						3P	PORTLAND UA	16.69			03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	M	OTH-Y		043	000		07
N						45 21 10.11	-122 52 4.44			009100200S00		(04)													OR<25					
																	02	NONE 0	STRGHT									006		00
																		PRVTE	S -N											
																		PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	STRGHT									006		00
																		PRVTE	S -N											
																		PSNGR CAR		02	PSNG	INJA	26	M			000	000		00
06116	N	N	N	N	N	10/02/2017	WASHINGTON	2	14		STRGHT		N	N	CLD	S-STRGHT	01	NONE 9	STRGHT										27,07
CITY						MO		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	S -N								000		00
N						5A	PORTLAND UA	16.69			04			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 21 10.11	-122 52 4.43			009100200S00		(04)													UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	006 000		00 00
05060 CITY N N	N	N	N	N			09/03/2015 TH 5P 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 	 009100200S00	STRGHT UN 03 	 (DIVMD) (04)	N UNKNOWN	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	26	F	OR-Y OR<25		043	000	013	07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	27	F	OR-Y OR<25		000	011 000	013	00 00
																	03	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	NONE	30	F	OR-Y OR<25		000	022 000		00 00
07488 CITY N N	N	N	N	N	N	N	12/08/2015 TU 12P 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 	 009100200S00	STRGHT UN 03 	 (DIVMD) (05)	N L-GRN-SIG	N N	RAIN WET DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	INJC	25	F	OR-Y OR<25		043	000		07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	NONE	57	F	OR-Y OR<25	000	000	011 000		00 00
07584 NONE N N	N	N	N	N			12/11/2015 FR 7A 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 	 009100200S00	STRGHT UN 03 	 (DIVMD) (04)	N UNKNOWN	N N	UNK UNK DAWN	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	32	F	OR-Y UNK	026	000	000 000		29 00 29
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	40	F	OR-Y OR<25	000	000	011 000		00 00
04867 COUNTY N N	N	N	N	N	N	N	09/21/2019 SA 10A 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.77	2 14 MN 0 16.70 	 009100200S00	STRGHT UN 04 	 (DIVMD) (04)	N NONE	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	31	M	OTH-Y OR<25	043	000	000 000		07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	01	DRVR	INJC	23	F	OR-Y OR<25	000	000	011 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	02	PSNG	INJC	22	F		000	000	011 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	03	PSNG	INJC	17	M		000	000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A C	M J U S	S N G V	W I H L	C O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06414	N	N	N	N	N	N	09/22/2016	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT										29
CITY							TH		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	S -N									000		00
N							1P	PORTLAND UA	16.71			04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 9.19	-122 52 5.13			009100200S00		(04)													UNK					
																		02	NONE 9	STRGHT											
																			N/A	S -N									000		00
																			TRUCK		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
01275	N	N	N	N	N	N	03/05/2017	WASHINGTON	2	14		STRGHT		N	N	CLD	S-1STOP	01	NONE 0	STRGHT										07,32
CITY							SU		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	S -N								000		00
N							11A	PORTLAND UA	16.71			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	81	M	OR-Y		043,052	000		07,32
N							45 21 9.19	-122 52 5.13			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	S -N									011	013	00
																			PSNGR CAR		01	DRVR	INJC	69	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP											
																			PRVTE	S -N									011	013	00
																			PSNGR CAR		02	PSNG	INJC	63	F			000	000		00
																		03	NONE 0	STOP											
																			PRVTE	S -N									022		00
																			PSNGR CAR		01	DRVR	INJC	71	M	OR-Y		000	000		00
																										OR<25					
05618	N	N	N	N	N	N	09/20/2017	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	07
CITY							WE		MN 0			UN	(DIVMD)	TRF SIGNAL	N	WET	REAR		PRVTE	S -N								000		00
N							3P	PORTLAND UA	16.71			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		043	000		07
N							45 21 9.19	-122 52 5.13			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	S -N									011	013	00
																			PSNGR CAR		01	DRVR	INJB	52	M	OR-Y		000	000		00
																										OR<25					
																		03	NONE 0	STOP											
																			PRVTE	S -N									022		00
																			PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000		00
																										OR<25					
01240	N	N	N	N	N	N	03/12/2019	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
COUNTY							TU		MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N							7A	PORTLAND UA	16.71			04			N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		043	000		07
N							45 21 9.18	-122 52 5.13			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	S -N									011		00
																			PSNGR CAR		01	DRVR	INJC	43	M	OR-Y		000	000		00
																										OR<25					

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 17.41 to 17.51 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

1 - 7 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES / PED LOC	ERROR	ACT	EVENT	CAUSE
03760	N	N	N	N			07/24/2019	WASHINGTON	1	14		STRGHT		N	N	CLR	ANIMAL	01	NONE 9	STRGHT									035	12
NONE							WE		MN 0		Not Related to Intersection	UN	(DIVMD)	UNKNOWN	N	DRY	OTH		N/A	N -S								000		00
N							9P	PORTLAND UA	17.42			03			N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
N							45 20 35.36	-122 52 24.81			009100100S00		(04)													UNK				
06064	N	N	N	N			09/29/2017	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										29
NONE							FR		MN 0			N		STOP SIGN	N	WET	REAR		N/A	N -S								000		00
N							2P	PORTLAND UA	17.47			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
N							45 20 32.89	-122 52 26.13			009100100S00															UNK				
																		02	NONE 9	STRGHT										
																			N/A	N -S								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
																										UNK				
04243	N	N	N	N			08/16/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										29
NONE							TH		MN 0			E		STOP SIGN	N	DRY	REAR		PRVTE	E -W								000		00
N							4P	PORTLAND UA	17.47			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	48	F	OR-Y	026	000		29
N							45 20 32.89	-122 52 26.13			009100100S00															OR<25				
																		02	NONE 0	STOP										
																			PRVTE	E -W								012		00
																			PSNGR CAR		01	DRVR	INJC	53	F	OR-Y	000	000		00
																										OR<25				
01401	N	N	N	N	N	N	03/20/2018	WASHINGTON	1	14		INTER	CROSS	N	Y	CLD	FIX OBJ	01	NONE 9	STRGHT									058	26
COUNTY							TU		MN 0			S		STOP SIGN	N	DRY	FIX		N/A	N -S								000		00
N							2P	PORTLAND UA	17.47			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
N							45 20 32.89	-122 52 26.13			009100100S00															UNK				
00236	N	N	N	N			01/15/2015	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY							TH		MN 0			CN		STOP SIGN	N	WET	TURN		PRVTE	N -S								000		00
N							5P	PORTLAND UA	17.47			01	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y	000	000		00
N							45 20 32.89	-122 52 26.13			009100100S00															OR<25				
																		02	NONE 0	TURN-L										
																			PRVTE	E -S								015		00
																			PSNGR CAR		01	DRVR	NONE	25	F	OR-Y	028	000		02
																										OR<25				
08443	N	N	N	N	N	N	12/09/2016	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										03
COUNTY							FR		MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	N -S								000		00
N							3P	PORTLAND UA	17.47			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
N							45 20 32.89	-122 52 26.13			009100100S00															UNK				
																		02	NONE 9	STRGHT										
																			N/A	E -W								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00
																										UNK				
07975	N	N	N	N			12/13/2017	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										03
COUNTY							WE		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	E -W								000		00
N							7P	PORTLAND UA	17.47			01	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	48	M	OR-Y	021	000		03
N							45 20 32.89	-122 52 26.13			009100100S00															OR<25				
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000		00
																			PSNGR CAR		01	DRVR	INJC	56	F	OR-Y	000	000		00
																										OR<25				

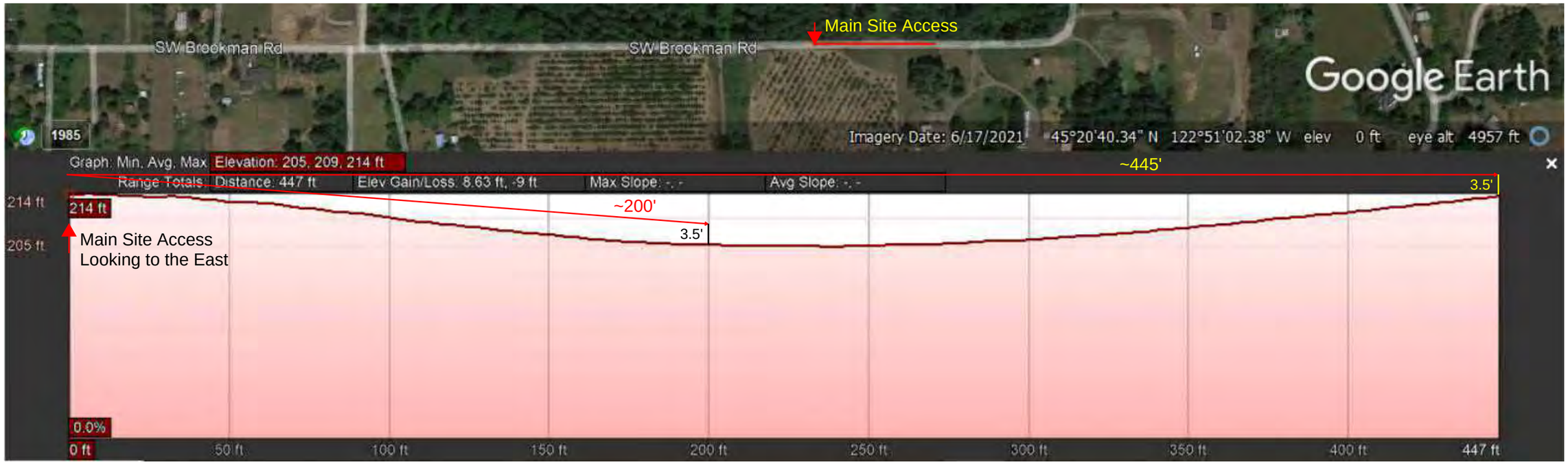
SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	W C O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01598	N	N	N	N		03/21/2017	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											02
NO RPT						TU		MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	E -W									000		00
N						7A	PORTLAND UA	17.47			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															UNK					
																	02	NONE 9	STRGHT											
																		N/A	N -S									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
02701	N	N	N	N		05/18/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											02
NO RPT						MO		MN 0			CN		STOP SIGN	N	DRY	TURN		PRVTE	W -E									000		00
N						5P	PORTLAND UA	17.47			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	40	F	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	TURN-L											
																		PRVTE	E -S									000		00
																		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		004,028	000		02
																									OR<25					
01335	N	N	N	N	N N	03/08/2017	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										058	02
COUNTY						WE		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	W -E									000	053	00
N						5P	PORTLAND UA	17.47			03	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	N -S									000		00
																		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		028	000		02
																									OR<25					
05249	N	N	N	N		08/27/2017	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L											02
NONE						SU		MN 0			CN		STOP SIGN	N	DRY	TURN		N/A	E -S									000		00
N						12P	PORTLAND UA	17.47			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															UNK					
																	02	NONE 9	STRGHT											
																		N/A	W -E									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
03053	N	N	N	N	N N	06/15/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						SA		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S									000		00
N						2P	PORTLAND UA	17.47			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	24	M	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	W -E									015		00
																		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		028	000		02
																									OR<25					
05515	N	N	N	N	N N	10/24/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L											02
COUNTY						TH		MN 0			CN		STOP SIGN	N	DRY	TURN		PRVTE	E -S									000		00
N						11A	PORTLAND UA	17.47			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	W -E									000		00
																		PSNGR CAR		01	DRVR	INJC	47	F	OR-Y		028	000		02
																									OR<25					

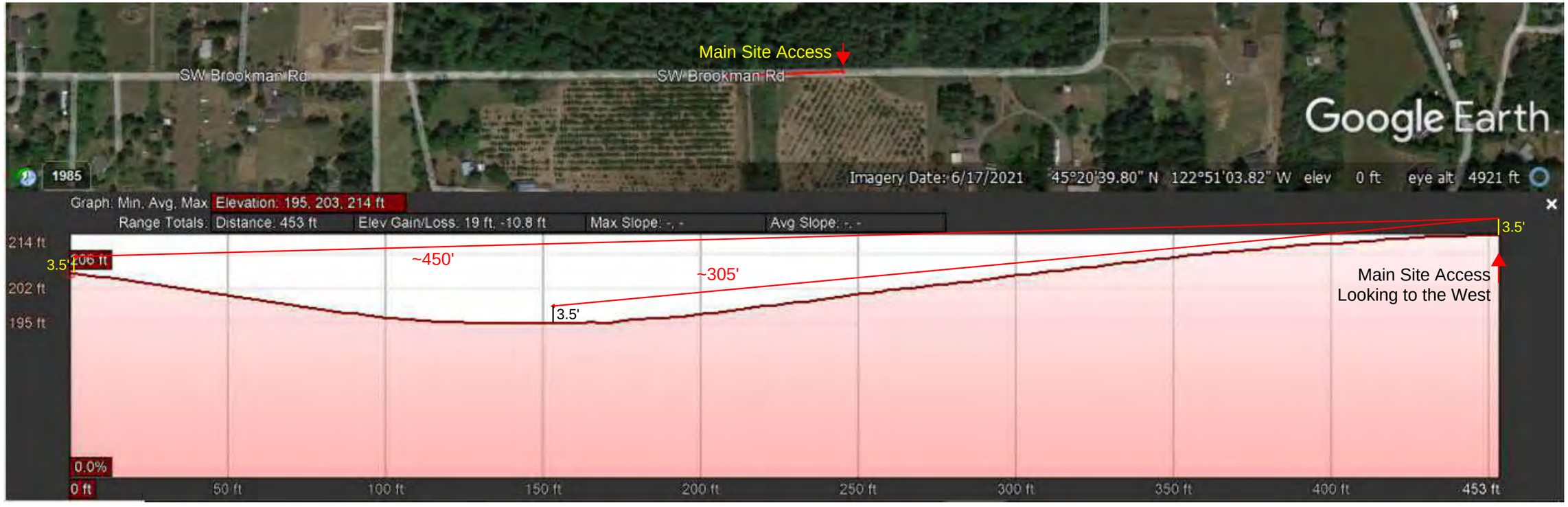
SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U V	S N H L	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06735	N	N	N	N	N	N	12/19/2019	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										02
COUNTY							TH		MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	W -E								000		00
N							4P	PORTLAND UA	17.47			03	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 32.89	-122 52 26.13			009100100S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	N -S								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
03675	N	N	N	N	N	N	07/20/2019	WASHINGTON	1	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										010	13
COUNTY							SA		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	SS-O		PRVTE	N -S								000	010	00
N							9P	PORTLAND UA	17.50			04			N	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	21	M	UNK		045	000		13
N							45 20 31.43	-122 52 26.93			009100100S00		(04)													OR>25					
																		01	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		02	PSNG	INJB	00	M			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		01	DRVR	INJB	42	M	OR-Y		000	000		00
																										OR>25				
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		02	PSNG	INJB	13	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		03	PSNG	INJB	15	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		04	PSNG	INJB	12	F			000	000		00
00536	Y	N	N	N	N	N	01/28/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE 9	TURN-R											01,08
COUNTY							SA		MN 0			E		STOP SIGN	N	DRY	TURN		N/A	S -E								000		00
N							4P	PORTLAND UA	17.46			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															UNK					
																		02	NONE 9	STOP										
																			N/A	E -W								011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
05762	N	N	N	N	N	N	09/18/2017	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											27,02
COUNTY							MO		MN 0			S		STOP SIGN	N	WET	TURN		N/A	N -S								000		00
N							10A	PORTLAND UA	17.46			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															UNK					
																		02	NONE 9	TURN-R										
																			N/A	W -S								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				

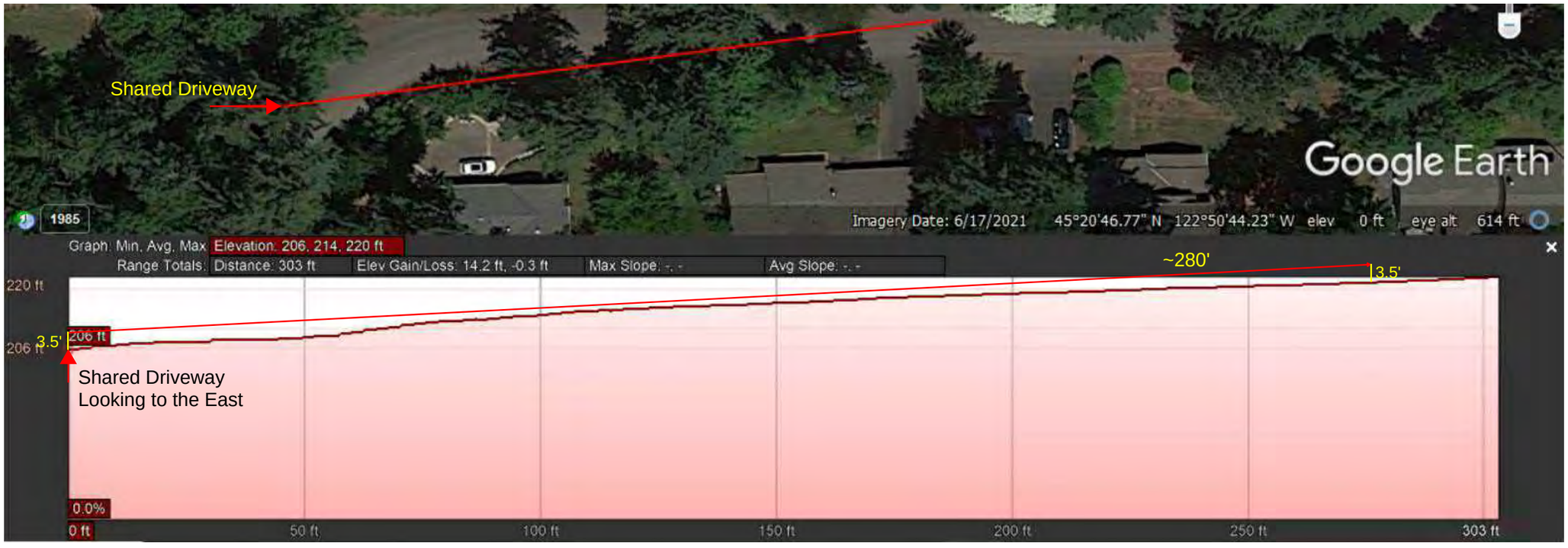
SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U V	S I N L	C N H K	W O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05017	N	N	N	N	N	N	N	09/29/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	TURN-L											08
COUNTY				SU						MN 0			W		STOP SIGN	N	DRY	TURN		PRVTE	E -S									000		00
N				2P				PORTLAND UA		17.46			05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		002	000		08
N				45 20 32.9				-122 52 24.87				009100200S00															OR<25					
																			02	NONE 0	STOP											
																				PRVTE	W -E									011		00
																				PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000		00
																											OR<25					
02243	N	N	N	N	N	N	N	04/27/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY				MO						MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N									000		00
N				2P				PORTLAND UA		17.46			01	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJA	68	M	OTH-Y		000	000		00
N				45 20 32.9				-122 52 24.87				009100200S00															N-RES					
																			02	NONE 0	STRGHT											
																				PRVTE	E -W									015		00
																				PSNGR CAR		01	DRVR	NONE	74	F	OR-Y		028	000		02
																											OR<25					
03254	N	N	N	N				05/18/2016	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L											02
NO RPT				WE						MN 0			CN		STOP SIGN	N	DRY	TURN		N/A	W -N									000		00
N				6A				PORTLAND UA		17.46			02	0		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 20 32.91				-122 52 24.87				009100200S00															UNK					
																			02	NONE 9	STRGHT											
																				N/A	E -W									000		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
05465	N	N	N	N				10/15/2018	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY				MO						MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N									000		00
N				6A				PORTLAND UA		17.46			02	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	INJC	39	M	OTH-Y		000	000		00
N				45 20 32.91				-122 52 24.87				009100200S00															N-RES					
																			01	NONE 0	STRGHT											
																				PRVTE	S -N									000		00
																				PSNGR CAR		02	PSNG	INJC	52	F			000	000		00
																			01	NONE 0	STRGHT											
																				PRVTE	S -N									000		00
																				PSNGR CAR		03	PSNG	INJC	32	F			000	000		00
																			02	NONE 0	STRGHT											
																				PRVTE	E -W									000		00
																				PSNGR CAR		01	DRVR	INJB	60	M	OR-Y		028	000		02
																											OR<25					
																			02	NONE 0	STRGHT											
																				PRVTE	E -W									000		00
																				PSNGR CAR		02	PSNG	INJB	55	M			000	000		00
07013	N	N	N	N	N	N	N	12/20/2018	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											02
COUNTY				TH						MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	E -W									000		00
N				6P				PORTLAND UA		17.46			02	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 20 32.9				-122 52 24.87				009100200S00															UNK					

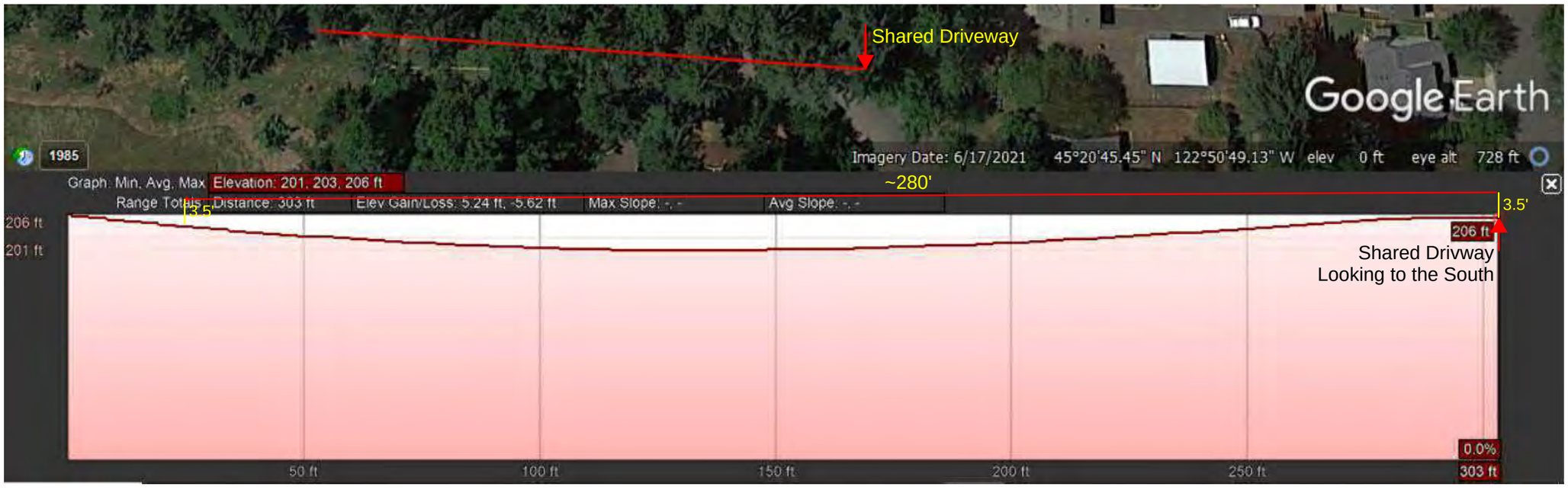
SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S N H V	W O R L	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 9	STRGHT										
																		N/A	S -N									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
05536	N	N	N	N	N	10/17/2018	WASHINGTON	2 14			INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT											02
COUNTY						WE		MN 0			CN		STOP SIGN	N	DRY	ANGL		N/A	S -N									000		00
N						4P	PORTLAND UA	17.46			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.9	-122 52 24.87			009100200S00															UNK					
																	02	NONE 9	STRGHT										
																		N/A	E -W									015		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
00282	N	N	N	N	N	01/16/2019	WASHINGTON	2 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						WE		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	S -N									000		00
N						7P	PORTLAND UA	17.46			02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	INJB	53	F	OR-Y		000	000		00
N						45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									015		00
																		PSNGR CAR		01	DRVR	INJC	30	M	OR-Y		028	000		02
																									OR<25					
01141	N	N	N	N	N	03/05/2019	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						TU		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N									000		00
N						5P	PORTLAND UA	17.46			02	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	65	M	OR-Y		000	000		00
N						45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									015		00
																		PSNGR CAR		01	DRVR	INJB	63	M	OR-Y		028	000		02
																									OR<25					
00125	N	N	N	N		01/08/2019	WASHINGTON	2 14			INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						TU		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	S -N									000		00
N						8A	PORTLAND UA	17.46			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000		00
N						45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									015		00
																		PSNGR CAR		01	DRVR	NONE	36	M	OR-Y		028	000		02
																									OR<25					
06521	N	N	N	N	N	12/10/2019	WASHINGTON	2 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										079	03
COUNTY						TU		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	E -W									000		00
N						5P	PORTLAND UA	17.46			02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		021	000		03
N						45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	S -N									000		00
																		PSNGR CAR		01	DRVR	INJB	23	M	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	S -N									000		00
																		PSNGR CAR		02	PSNG	INJC	22	F			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J G N S V	S C H L	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	03	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	62	M	OR-Y OR<25		000	022 000	079	00 00
06925 COUNTY N N	N	N	N N N N		N	12/27/2019 FR 7P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 02	CROSS 0	N STOP SIGN	N N N	CLR DRY DLIT	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	INJC	32	F	OR-Y OR<25		000	000 000	079	27,02,32 00 00
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	INJC	42	M	OR-Y OR<25		016,028,052	000 038	079	00 27,02,32
07481 COUNTY N N	N	N	N N N N		N	11/25/2017 SA 8P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 04	CROSS 0	N STOP SIGN	N N N	CLD WET DARK	ANGL-OTH ANGL PDO	01	NONE 9 N/A PSNGR CAR	STRGHT W -E	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		02,32 00 00
																	02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00
02527 COUNTY N N	N	N	N N N N		N	05/19/2018 SA 2P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 04	CROSS 0	N STOP SIGN	N N N	CLR DRY DAY	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	16	F	OR-Y OR<25		028,052	000 000		02,32 00 02,32
																	01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	02	PSNG	INJB	16	M			000	015 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	53	M	OTH-Y N-RES		000	000 000		00 00


Main Site Access
SW Brookman Rd
SW Brookman Rd
Google Earth
1985
Imagery Date: 6/17/2021 45°20'40.34" N 122°51'02.38" W elev 0 ft eye alt 4957 ft
Graph: Min, Avg, Max Elevation: 205, 209, 214 ft
Range Totals: Distance: 447 ft Elev Gain/Loss: 8.63 ft, -9 ft Max Slope: -, - Avg Slope: -, -
~445'
3.5'
214 ft
214 ft
205 ft
~200'
3.5'
Main Site Access
Looking to the East
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
300 ft
350 ft
400 ft
447 ft


Main Site Access
SW Brookman Rd
SW Brookman Rd
Google Earth
1985
Imagery Date: 6/17/2021 45°20'39.80" N 122°51'03.82" W elev 0 ft eye alt 4921 ft
Graph: Min, Avg, Max Elevation: 195, 203, 214 ft
Range Totals: Distance: 453 ft Elev Gain/Loss: 19 ft, -10.8 ft Max Slope: -, - Avg Slope: -, -
3.5'
214 ft
206 ft
202 ft
195 ft
3.5'
~450'
~305'
3.5'
Main Site Access
Looking to the West
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
300 ft
350 ft
400 ft
453 ft


Shared Driveway
Google Earth
1985
Imagery Date: 6/17/2021 45°20'46.77" N 122°50'44.23" W elev 0 ft eye alt 614 ft
Graph: Min, Avg, Max Elevation: 206, 214, 220 ft
Range Totals: Distance: 303 ft Elev Gain/Loss: 14.2 ft, -0.3 ft Max Slope: -, - Avg Slope: -, -
~280'
3.5'
220 ft
206 ft
206 ft
3.5'
Shared Driveway
Looking to the East
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
303 ft


Shared Driveway
Google Earth
1985
Imagery Date: 6/17/2021 45°20'45.45" N 122°50'49.13" W elev 0 ft eye alt 728 ft
Graph: Min, Avg, Max Elevation: 201, 203, 206 ft
Range Totals: Distance: 303 ft Elev Gain/Loss: 5.24 ft, -5.62 ft Max Slope: -, - Avg Slope: -, -
~280'
3.5'
3.5'
206 ft
201 ft
206 ft
Shared Drivway
Looking to the South
0.0%
50 ft
100 ft
150 ft
200 ft
250 ft
303 ft

Left-Turn Lane Warrant Analysis

Project: Cedar Creek Gardens
Intersection: Main Access
Date: 11/4/2021
Scenario: Year 2024 Buildout Conditions - AM Peak Hour

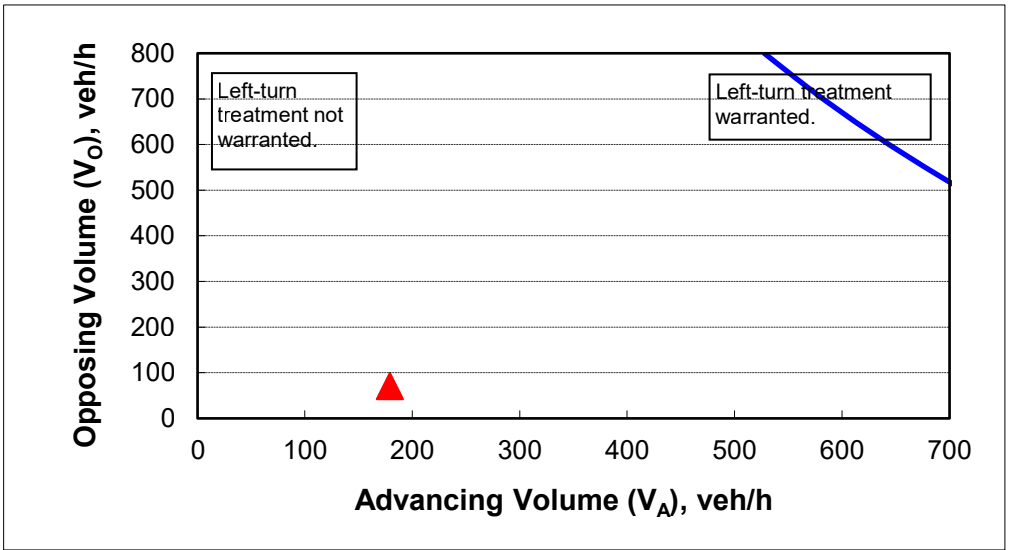
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Left-turns in advancing volume (V_A), veh/hr:	4
Advancing volume (V_A), veh/h:	179
Opposing volume (V_O), veh/h:	71

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1145
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Cedar Creek Gardens
Intersection: Main Access
Date: 11/4/2021
Scenario: Year 2024 Buildout Conditions - PM Peak Hour

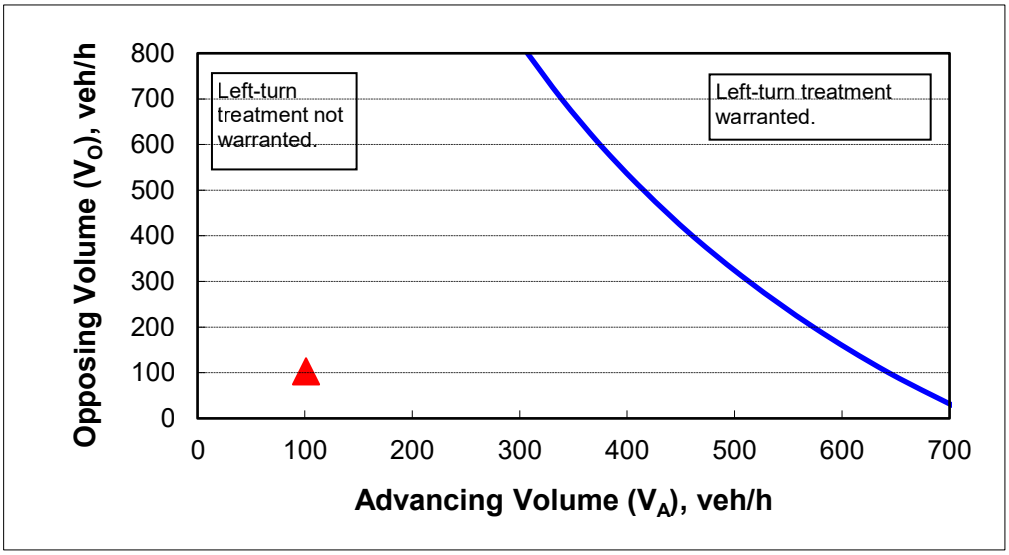
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Left-turns in advancing volume (V_A), veh/hr:	7
Advancing volume (V_A), veh/h:	101
Opposing volume (V_O), veh/h:	103

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	641
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Level of Service Definitions

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

- *Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.
- *Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.
- *Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.
- *Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.
- *Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.
- *Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

Level of Service Criteria
For Signalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

Level of Service Criteria
For Unsignalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

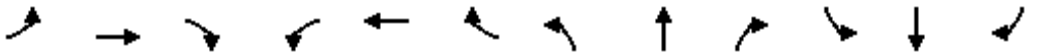
11/10/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	114	244	147	195	244	269	1644	114	141	800	16
Future Volume (vph)	22	114	244	147	195	244	269	1644	114	141	800	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3212		3367	3471	1553	3213	3312	1482
Flt Permitted	0.29	1.00	1.00	0.51	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	537	1845	1568	933	3212		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	120	257	155	205	257	283	1731	120	148	842	17
RTOR Reduction (vph)	0	0	216	0	153	0	0	0	49	0	0	8
Lane Group Flow (vph)	23	120	41	155	309	0	283	1731	71	148	842	9
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	21.5	18.2	18.2	27.1	21.0		13.5	62.4	62.4	8.2	57.1	57.1
Effective Green, g (s)	23.5	19.2	18.2	29.1	22.0		14.5	63.4	63.4	9.2	58.1	58.1
Actuated g/C Ratio	0.20	0.17	0.16	0.25	0.19		0.13	0.55	0.55	0.08	0.51	0.51
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	308	248	286	615		424	1915	856	257	1674	749
v/s Ratio Prot	0.01	0.07		c0.03	0.10		c0.08	c0.50		0.05	0.25	
v/s Ratio Perm	0.02		0.03	c0.10					0.05			0.01
v/c Ratio	0.15	0.39	0.16	0.54	0.50		0.67	0.90	0.08	0.58	0.50	0.01
Uniform Delay, d1	37.1	42.6	41.8	36.0	41.6		47.9	23.0	12.1	51.0	18.8	14.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8	0.3	2.1	0.6		4.0	6.5	0.0	3.1	0.2	0.0
Delay (s)	37.5	43.4	42.1	38.1	42.2		51.9	29.5	12.1	54.1	19.1	14.1
Level of Service	D	D	D	D	D		D	C	B	D	B	B
Approach Delay (s)		42.2			41.2			31.5			24.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	114.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	114	244	147	195	244	269	1644	114	141	800	16
Future Volume (veh/h)	22	114	244	147	195	244	269	1644	114	141	800	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	23	120	46	155	205	99	283	1731	67	148	842	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	190	198	153	245	320	149	386	2041	910	282	1868	833
Arrive On Green	0.04	0.11	0.10	0.07	0.14	0.13	0.11	0.58	0.58	0.09	0.56	0.56
Sat Flow, veh/h	1767	1856	1572	1767	2337	1086	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	23	120	46	155	153	151	283	1731	67	148	842	12
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1660	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	1.2	6.4	2.8	7.0	8.4	8.9	8.3	42.0	1.9	4.5	15.3	0.4
Cycle Q Clear(g_c), s	1.2	6.4	2.8	7.0	8.4	8.9	8.3	42.0	1.9	4.5	15.3	0.4
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	190	198	153	245	241	227	386	2041	910	282	1868	833
V/C Ratio(X)	0.12	0.61	0.30	0.63	0.63	0.67	0.73	0.85	0.07	0.53	0.45	0.01
Avail Cap(c_a), veh/h	244	306	244	245	291	274	528	2411	1075	285	2086	930
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	43.9	43.2	38.7	42.0	42.5	44.1	17.7	9.3	45.0	13.5	10.2
Incr Delay (d2), s/veh	0.3	3.0	1.1	5.3	3.2	4.6	3.4	2.6	0.0	1.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.0	1.1	3.8	3.8	3.9	3.5	15.1	0.6	1.8	5.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	46.9	44.3	44.0	45.2	47.1	47.5	20.3	9.4	46.8	13.7	10.2
LnGrp LOS	D	D	D	D	D	D	D	C	A	D	B	B
Approach Vol, veh/h		189			459			2081			1002	
Approach Delay, s/veh		45.3			45.4			23.7			18.5	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	64.1	11.0	15.0	15.7	61.3	7.9	18.1
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	70.0	6.0	16.0	15.0	63.0	6.0	16.0
Max Q Clear Time (g_c+I1), s	6.5	44.0	9.0	8.4	10.3	17.3	3.2	10.9
Green Ext Time (p_c), s	0.1	15.1	0.0	0.4	0.4	6.4	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	5	5	0	0	47	11	1925	92	22	1151	21
Future Vol, veh/h	27	5	5	0	0	47	11	1925	92	22	1151	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	275	-	-	260	-	240
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	28	5	5	0	0	49	11	2005	96	23	1199	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2270	3368	600	-	-	1051	1221	0	0	2101	0	0
Stage 1	1245	1245	-	-	-	-	-	-	-	-	-	-
Stage 2	1025	2123	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	-	-	7.08	4.18	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	-	-	3.39	2.24	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 20	7	427	0	0	212	556	-	-	241	-	-
Stage 1	174	231	-	0	0	-	-	-	-	-	-	-
Stage 2	239	82	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 14	6	427	-	-	212	556	-	-	241	-	-
Mov Cap-2 Maneuver	108	52	-	-	-	-	-	-	-	-	-	-
Stage 1	171	209	-	-	-	-	-	-	-	-	-	-
Stage 2	180	80	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	59.5	27	0.1	0.4
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	556	-	-	103	212	241	-	-
HCM Lane V/C Ratio	0.021	-	-	0.374	0.231	0.095	-	-
HCM Control Delay (s)	11.6	-	-	59.5	27	21.5	-	-
HCM Lane LOS	B	-	-	F	D	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.9	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

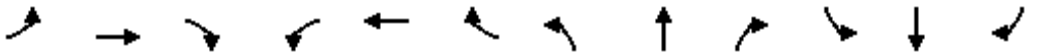
11/10/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	130	319	178	114	146	243	1051	135	281	1743	16
Future Volume (vph)	16	130	319	178	114	146	243	1051	135	281	1743	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3179		3400	3505	1568	3433	3539	1583
Flt Permitted	0.57	1.00	1.00	0.48	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1057	1863	1583	870	3179		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	138	339	189	121	155	259	1118	144	299	1854	17
RTOR Reduction (vph)	0	0	126	0	120	0	0	0	73	0	0	8
Lane Group Flow (vph)	17	138	213	189	156	0	259	1118	71	299	1854	9
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	24.8	22.5	22.5	32.2	26.2		9.0	59.2	59.2	13.9	64.1	64.1
Effective Green, g (s)	26.8	23.5	22.5	34.2	27.2		10.0	60.2	60.2	14.9	65.1	65.1
Actuated g/C Ratio	0.22	0.19	0.19	0.28	0.22		0.08	0.50	0.50	0.12	0.54	0.54
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	252	360	292	294	711		279	1735	776	420	1894	847
v/s Ratio Prot	0.00	0.07		c0.04	0.05		c0.08	0.32		c0.09	c0.52	
v/s Ratio Perm	0.01		0.13	c0.14					0.05			0.01
v/c Ratio	0.07	0.38	0.73	0.64	0.22		0.93	0.64	0.09	0.71	0.98	0.01
Uniform Delay, d1	37.3	42.7	46.7	38.1	38.5		55.4	22.8	16.2	51.3	27.6	13.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.7	8.8	4.8	0.2		35.0	0.8	0.1	5.6	15.8	0.0
Delay (s)	37.4	43.4	55.4	42.8	38.7		90.4	23.6	16.3	56.9	43.3	13.2
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		51.5			40.4			34.3			45.0	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	130	319	178	114	146	243	1051	135	281	1743	16
Future Volume (veh/h)	16	130	319	178	114	146	243	1051	135	281	1743	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	17	138	190	189	121	27	259	1118	85	299	1854	12
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	291	276	220	252	508	110	298	1902	848	390	2009	896
Arrive On Green	0.03	0.15	0.14	0.06	0.18	0.17	0.09	0.54	0.54	0.11	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	1753	2857	621	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	17	138	190	189	73	75	259	1118	85	299	1854	12
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1729	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	0.9	7.8	13.5	7.0	4.1	4.3	8.6	24.6	3.0	9.7	54.5	0.4
Cycle Q Clear(g_c), s	0.9	7.8	13.5	7.0	4.1	4.3	8.6	24.6	3.0	9.7	54.5	0.4
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	291	276	220	252	311	307	298	1902	848	390	2009	896
V/C Ratio(X)	0.06	0.50	0.86	0.75	0.23	0.24	0.87	0.59	0.10	0.77	0.92	0.01
Avail Cap(c_a), veh/h	345	326	262	252	311	307	298	1902	848	481	2072	924
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	45.1	48.4	43.1	40.5	40.8	51.8	17.8	12.9	49.5	22.7	10.9
Incr Delay (d2), s/veh	0.1	1.4	21.8	11.9	0.4	0.4	22.8	0.5	0.1	5.8	7.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.7	6.6	2.7	1.8	1.9	4.5	9.2	1.1	4.4	22.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3	46.5	70.3	54.9	40.9	41.2	74.6	18.3	12.9	55.3	30.1	10.9
LnGrp LOS	D	D	E	D	D	D	E	B	B	E	C	B
Approach Vol, veh/h		345			337			1462			2165	
Approach Delay, s/veh		59.2			48.8			28.0			33.4	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	66.0	11.0	20.9	14.0	69.0	7.5	24.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	15.0	60.0	6.0	19.0	9.0	66.0	6.0	19.0
Max Q Clear Time (g_c+I1), s	11.7	26.6	9.0	15.5	10.6	56.5	2.9	6.3
Green Ext Time (p_c), s	0.3	9.3	0.0	0.5	0.0	7.5	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	34.9
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	5	11	0	0	32	16	1379	49	27	2155	48
Future Vol, veh/h	22	5	11	0	0	32	16	1379	49	27	2155	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	275	-	-	260	-	240
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	23	5	11	0	0	33	17	1436	51	28	2245	50

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3053	3822	1123	-	-	744	2295	0	0	1487	0	0
Stage 1	2301	2301	-	-	-	-	-	-	-	-	-	-
Stage 2	752	1521	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	-	-	6.92	4.16	-	-	4.14	-	-
Critical Hdwy Stg 1	6.56	5.56	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	-	-	3.31	2.23	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 5	~ 4	198	0	0	359	213	-	-	448	-	-
Stage 1	39	71	-	0	0	-	-	-	-	-	-	-
Stage 2	366	178	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 4	~ 3	198	-	-	359	213	-	-	448	-	-
Mov Cap-2 Maneuver	34	55	-	-	-	-	-	-	-	-	-	-
Stage 1	36	67	-	-	-	-	-	-	-	-	-	-
Stage 2	306	164	-	-	-	-	-	-	-	-	-	-

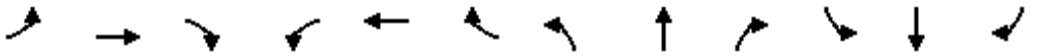
Approach	EB	WB	NB	SB
HCM Control Delay, s	212	16.1	0.3	0.2
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	213	-	-	48	359	448	-	-
HCM Lane V/C Ratio	0.078	-	-	0.825	0.093	0.063	-	-
HCM Control Delay (s)	23.3	-	-	212	16.1	13.6	-	-
HCM Lane LOS	C	-	-	F	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	3.4	0.3	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

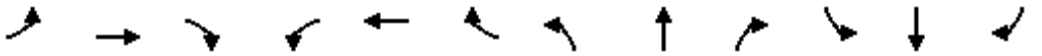


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	255	290	162	402	237	383	1697	121	192	764	195
Future Volume (vph)	133	255	290	162	402	237	383	1697	121	192	764	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3310		3367	3471	1553	3213	3312	1482
Flt Permitted	0.18	1.00	1.00	0.24	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	325	1845	1568	441	3310		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	268	305	171	423	249	403	1786	127	202	804	205
RTOR Reduction (vph)	0	0	168	0	70	0	0	0	50	0	0	110
Lane Group Flow (vph)	140	268	137	171	602	0	403	1786	77	202	804	95
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	27.7	21.7	21.7	29.7	22.7		18.2	64.1	64.1	8.0	53.9	53.9
Effective Green, g (s)	29.7	22.7	21.7	31.7	23.7		19.2	65.1	65.1	9.0	54.9	54.9
Actuated g/C Ratio	0.25	0.19	0.18	0.26	0.20		0.16	0.54	0.54	0.07	0.45	0.45
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	346	281	202	649		535	1870	836	239	1505	673
v/s Ratio Prot	0.05	0.15		c0.06	c0.18		c0.12	c0.51		0.06	0.24	
v/s Ratio Perm	0.16		0.09	0.17					0.05			0.06
v/c Ratio	0.86	0.77	0.49	0.85	0.93		0.75	0.96	0.09	0.85	0.53	0.14
Uniform Delay, d1	40.7	46.6	44.5	39.6	47.7		48.5	26.5	13.5	55.2	23.7	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	10.3	1.3	26.4	19.4		5.9	11.9	0.0	23.0	0.4	0.1
Delay (s)	75.6	57.0	45.9	66.0	67.1		54.5	38.3	13.6	78.2	24.1	19.3
Level of Service	E	E	D	E	E		D	D	B	E	C	B
Approach Delay (s)		55.9			66.9			39.8			32.3	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	255	290	162	402	237	383	1697	121	192	764	195
Future Volume (veh/h)	133	255	290	162	402	237	383	1697	121	192	764	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	140	268	94	171	423	91	403	1786	74	202	804	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	197	313	252	211	512	109	496	1922	857	251	1614	720
Arrive On Green	0.06	0.17	0.16	0.07	0.18	0.17	0.15	0.55	0.55	0.08	0.48	0.48
Sat Flow, veh/h	1767	1856	1572	1767	2890	617	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	140	268	94	171	257	257	403	1786	74	202	804	200
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1745	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	7.0	16.4	6.3	8.0	16.4	16.7	13.4	55.0	2.6	7.1	19.2	9.4
Cycle Q Clear(g_c), s	7.0	16.4	6.3	8.0	16.4	16.7	13.4	55.0	2.6	7.1	19.2	9.4
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	313	252	211	312	309	496	1922	857	251	1614	720
V/C Ratio(X)	0.71	0.86	0.37	0.81	0.82	0.83	0.81	0.93	0.09	0.81	0.50	0.28
Avail Cap(c_a), veh/h	197	333	269	211	331	328	610	1971	879	251	1614	720
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	47.3	43.9	41.5	46.4	46.7	48.5	24.3	12.5	53.2	20.8	18.2
Incr Delay (d2), s/veh	11.1	18.6	0.9	20.8	14.6	15.9	6.8	8.3	0.0	17.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	9.1	2.5	2.3	8.4	8.5	6.0	22.5	0.9	3.4	7.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	65.9	44.9	62.4	61.0	62.6	55.3	32.6	12.5	70.4	21.0	18.4
LnGrp LOS	D	E	D	E	E	E	E	C	B	E	C	B
Approach Vol, veh/h		502			685			2263			1206	
Approach Delay, s/veh		58.0			62.0			36.0			28.8	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	68.4	12.0	23.7	21.1	60.3	11.0	24.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	65.0	7.0	20.0	20.0	53.0	6.0	21.0
Max Q Clear Time (g_c+I1), s	9.1	57.0	10.0	18.4	15.4	21.2	9.0	18.7
Green Ext Time (p_c), s	0.0	6.3	0.0	0.3	0.6	6.6	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	40.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	37	0	0	135	0	2030	104	0	1206	30
Future Vol, veh/h	0	0	37	0	0	135	0	2030	104	0	1206	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	0	0	39	0	0	141	0	2115	108	0	1256	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	628	-	-	1112	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.08	-	-	7.08	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.39	-	-	3.39	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	409	0	0	192	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	409	-	-	192	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	62.6	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	409	192	-	-
HCM Lane V/C Ratio	-	-	0.094	0.732	-	-
HCM Control Delay (s)	-	-	14.7	62.6	-	-
HCM Lane LOS	-	-	B	F	-	-
HCM 95th %tile Q(veh)	-	-	0.3	4.7	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	121	50	18	52	77
Future Vol, veh/h	27	121	50	18	52	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	40	178	74	26	76	113

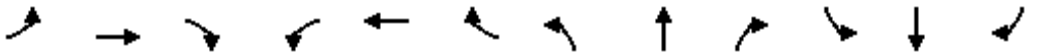
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	100	0	-	0	345	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1499	-	-	-	656	977
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1499	-	-	-	636	977
Mov Cap-2 Maneuver	-	-	-	-	636	-
Stage 1	-	-	-	-	913	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1499	-	-	-	803
HCM Lane V/C Ratio	0.026	-	-	-	0.236
HCM Control Delay (s)	7.5	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

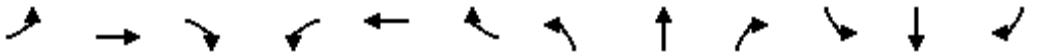


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	177	346	192	155	154	285	1107	143	423	1755	46
Future Volume (vph)	46	177	346	192	155	154	285	1107	143	423	1755	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3212		3400	3505	1568	3433	3539	1583
Flt Permitted	0.45	1.00	1.00	0.36	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	831	1863	1583	655	3212		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	188	368	204	165	164	303	1178	152	450	1867	49
RTOR Reduction (vph)	0	0	138	0	132	0	0	0	84	0	0	23
Lane Group Flow (vph)	49	188	230	204	197	0	303	1178	68	450	1867	26
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.7	20.2	20.2	31.7	22.7		10.0	54.2	54.2	19.9	64.1	64.1
Effective Green, g (s)	28.7	21.2	20.2	33.7	23.7		11.0	55.2	55.2	20.9	65.1	65.1
Actuated g/C Ratio	0.23	0.17	0.16	0.27	0.19		0.09	0.45	0.45	0.17	0.53	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	250	320	259	266	617		303	1569	701	581	1868	835
v/s Ratio Prot	0.01	0.10		c0.06	0.06		c0.09	0.34		0.13	c0.53	
v/s Ratio Perm	0.03		0.15	c0.15					0.04			0.02
v/c Ratio	0.20	0.59	0.89	0.77	0.32		1.00	0.75	0.10	0.77	1.00	0.03
Uniform Delay, d1	37.4	47.0	50.4	39.0	42.9		56.1	28.3	19.7	48.9	29.1	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.7	28.5	12.4	0.3		51.7	2.1	0.1	6.4	20.5	0.0
Delay (s)	37.8	49.8	78.9	51.4	43.2		107.9	30.4	19.7	55.3	49.6	14.0
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		66.5			46.3			43.8			50.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	177	346	192	155	154	285	1107	143	423	1755	46
Future Volume (veh/h)	46	177	346	192	155	154	285	1107	143	423	1755	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	49	188	219	204	165	36	303	1178	93	450	1867	44
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	305	281	225	259	530	113	315	1677	748	544	1923	858
Arrive On Green	0.05	0.15	0.14	0.08	0.18	0.18	0.09	0.48	0.48	0.16	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1753	2868	611	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	49	188	219	204	99	102	303	1178	93	450	1867	44
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1731	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	2.7	11.4	16.5	10.0	5.9	6.1	10.6	31.5	4.0	15.1	60.9	1.6
Cycle Q Clear(g_c), s	2.7	11.4	16.5	10.0	5.9	6.1	10.6	31.5	4.0	15.1	60.9	1.6
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	281	225	259	323	320	315	1677	748	544	1923	858
V/C Ratio(X)	0.16	0.67	0.97	0.79	0.31	0.32	0.96	0.70	0.12	0.83	0.97	0.05
Avail Cap(c_a), veh/h	367	281	225	259	323	320	315	1677	748	663	1927	859
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	48.1	51.2	41.2	42.2	42.5	54.2	24.8	17.5	48.9	26.6	13.0
Incr Delay (d2), s/veh	0.2	6.0	52.6	14.7	0.5	0.6	40.8	1.3	0.1	7.2	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.7	9.7	2.2	2.6	2.7	6.2	12.6	1.4	6.9	26.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	54.1	103.8	55.9	42.7	43.0	95.0	26.1	17.6	56.1	40.8	13.0
LnGrp LOS	D	D	F	E	D	D	F	C	B	E	D	B
Approach Vol, veh/h		456			405			1574			2361	
Approach Delay, s/veh		76.5			49.4			38.9			43.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.9	61.0	14.0	22.0	15.0	68.9	9.8	26.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	22.0	52.0	9.0	17.0	10.0	64.0	9.0	17.0
Max Q Clear Time (g_c+I1), s	17.1	33.5	12.0	18.5	12.6	62.9	4.7	8.1
Green Ext Time (p_c), s	0.7	8.0	0.0	0.0	0.0	1.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	42	0	0	81	0	1451	72	0	2229	60
Future Vol, veh/h	0	0	42	0	0	81	0	1451	72	0	2229	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	0	0	44	0	0	84	0	1511	75	0	2322	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1161	-	-	793	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.96	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.33	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	187	0	0	334	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	187	-	-	334	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	19.4	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	187	334	-	-
HCM Lane V/C Ratio	-	-	0.234	0.253	-	-
HCM Control Delay (s)	-	-	30	19.4	-	-
HCM Lane LOS	-	-	D	C	-	-
HCM 95th %tile Q(veh)	-	-	0.9	1	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	85	59	43	54	34	48
Future Vol, veh/h	85	59	43	54	34	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	123	86	62	78	49	70

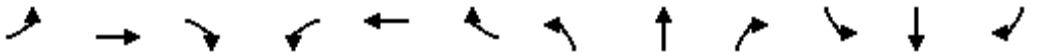
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	140	0	-	0	433	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1443	-	-	-	584	960
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	731	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1443	-	-	-	532	960
Mov Cap-2 Maneuver	-	-	-	-	532	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	731	-

Approach	EB	WB	SB
HCM Control Delay, s	4.6	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1443	-	-	-	720
HCM Lane V/C Ratio	0.085	-	-	-	0.165
HCM Control Delay (s)	7.7	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

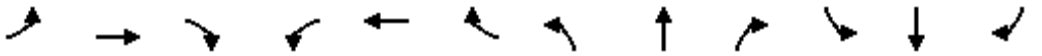


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	255	290	165	403	239	383	1707	121	196	764	195
Future Volume (vph)	133	255	290	165	403	239	383	1707	121	196	764	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3309		3367	3471	1553	3213	3312	1482
Flt Permitted	0.18	1.00	1.00	0.22	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	337	1845	1568	413	3309		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	268	305	174	424	252	403	1797	127	206	804	205
RTOR Reduction (vph)	0	0	168	0	71	0	0	0	50	0	0	109
Lane Group Flow (vph)	140	268	137	174	605	0	403	1797	77	206	804	96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.9	20.9	20.9	28.9	21.9		18.2	64.7	64.7	8.0	54.5	54.5
Effective Green, g (s)	28.9	21.9	20.9	30.9	22.9		19.2	65.7	65.7	9.0	55.5	55.5
Actuated g/C Ratio	0.24	0.18	0.17	0.26	0.19		0.16	0.54	0.54	0.07	0.46	0.46
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	335	271	194	628		536	1890	846	239	1524	682
v/s Ratio Prot	0.05	0.15		c0.06	c0.18		c0.12	c0.52		0.06	0.24	
v/s Ratio Perm	0.16		0.09	0.17					0.05			0.06
v/c Ratio	0.86	0.80	0.51	0.90	0.96		0.75	0.95	0.09	0.86	0.53	0.14
Uniform Delay, d1	41.1	47.3	45.2	40.5	48.4		48.4	25.9	13.2	55.2	23.2	18.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	12.8	1.5	37.0	26.8		5.9	11.2	0.0	25.8	0.3	0.1
Delay (s)	76.0	60.0	46.7	77.5	75.2		54.3	37.2	13.2	81.0	23.5	18.9
Level of Service	E	E	D	E	E		D	D	B	F	C	B
Approach Delay (s)		57.5			75.7			38.8			32.5	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	255	290	165	403	239	383	1707	121	196	764	195
Future Volume (veh/h)	133	255	290	165	403	239	383	1707	121	196	764	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	140	268	94	174	424	94	403	1797	74	206	804	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	193	309	249	207	504	111	495	1936	863	249	1625	725
Arrive On Green	0.06	0.17	0.16	0.07	0.18	0.17	0.15	0.55	0.55	0.08	0.48	0.48
Sat Flow, veh/h	1767	1856	1572	1767	2873	632	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	140	268	94	174	259	259	403	1797	74	206	804	200
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1742	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	7.0	16.6	6.3	8.0	16.7	17.0	13.5	55.7	2.6	7.3	19.2	9.4
Cycle Q Clear(g_c), s	7.0	16.6	6.3	8.0	16.7	17.0	13.5	55.7	2.6	7.3	19.2	9.4
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	193	309	249	207	309	305	495	1936	863	249	1625	725
V/C Ratio(X)	0.73	0.87	0.38	0.84	0.84	0.85	0.81	0.93	0.09	0.83	0.49	0.28
Avail Cap(c_a), veh/h	193	315	253	207	314	310	605	1987	886	249	1625	725
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	47.9	44.4	42.4	47.0	47.3	48.9	24.2	12.3	53.7	20.6	18.1
Incr Delay (d2), s/veh	12.7	21.3	0.9	25.2	17.6	19.2	7.0	8.2	0.0	20.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	9.4	0.1	2.7	8.8	8.9	6.1	22.6	0.9	3.6	7.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	69.2	45.4	67.6	64.6	66.5	55.9	32.4	12.4	73.8	20.9	18.3
LnGrp LOS	D	E	D	E	E	E	E	C	B	E	C	B
Approach Vol, veh/h		502			692			2274			1210	
Approach Delay, s/veh		60.5			66.1			35.9			29.4	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	69.3	12.0	23.7	21.2	61.1	11.0	24.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	66.0	7.0	19.0	20.0	54.0	6.0	20.0
Max Q Clear Time (g_c+I1), s	9.3	57.7	10.0	18.6	15.5	21.2	9.0	19.0
Green Ext Time (p_c), s	0.0	6.6	0.0	0.1	0.6	6.6	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	41.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	37	0	0	145	0	2030	105	0	1206	30
Future Vol, veh/h	0	0	37	0	0	145	0	2030	105	0	1206	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	0	0	39	0	0	151	0	2115	109	0	1256	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	628	-	-	1112	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.08	-	-	7.08	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.39	-	-	3.39	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	409	0	0	192	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	409	-	-	192	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	70.3	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	409	192	-	-
HCM Lane V/C Ratio	-	-	0.094	0.787	-	-
HCM Control Delay (s)	-	-	14.7	70.3	-	-
HCM Lane LOS	-	-	B	F	-	-
HCM 95th %tile Q(veh)	-	-	0.3	5.4	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	125	61	19	54	80
Future Vol, veh/h	28	125	61	19	54	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	41	184	90	28	79	118

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	118	0	-	0	370	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1476	-	-	-	634	956
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1476	-	-	-	614	956
Mov Cap-2 Maneuver	-	-	-	-	614	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1476	-	-	-	781
HCM Lane V/C Ratio	0.028	-	-	-	0.252
HCM Control Delay (s)	7.5	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	175	69	2	6	11
Future Vol, veh/h	4	175	69	2	6	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	6	257	101	3	9	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	104	0	-	0	372	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	269	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1494	-	-	-	633	957
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	781	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1494	-	-	-	630	957
Mov Cap-2 Maneuver	-	-	-	-	630	-
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	781	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1494	-	-	-	809
HCM Lane V/C Ratio	0.004	-	-	-	0.031
HCM Control Delay (s)	7.4	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	181	71	0
Future Vol, veh/h	2	0	0	181	71	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	1	1	8	8
Mvmt Flow	3	0	0	266	104	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	370	104	104	0	-	0
Stage 1	104	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	630	951	1494	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	630	951	1494	-	-	-
Mov Cap-2 Maneuver	630	-	-	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	779	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	630	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	10.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

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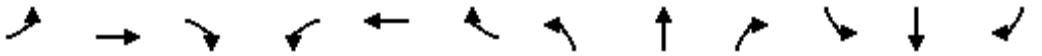
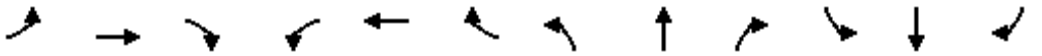


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	178	346	193	156	155	285	1114	143	429	1755	46
Future Volume (vph)	46	178	346	193	156	155	285	1114	143	429	1755	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3212		3400	3505	1568	3433	3539	1583
Flt Permitted	0.44	1.00	1.00	0.36	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	826	1863	1583	651	3212		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	189	368	205	166	165	303	1185	152	456	1867	49
RTOR Reduction (vph)	0	0	138	0	133	0	0	0	84	0	0	23
Lane Group Flow (vph)	49	189	230	205	198	0	303	1185	68	456	1867	26
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.7	20.2	20.2	31.7	22.7		10.0	54.1	54.1	20.0	64.1	64.1
Effective Green, g (s)	28.7	21.2	20.2	33.7	23.7		11.0	55.1	55.1	21.0	65.1	65.1
Actuated g/C Ratio	0.23	0.17	0.16	0.27	0.19		0.09	0.45	0.45	0.17	0.53	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	249	320	259	265	617		303	1566	700	584	1868	835
v/s Ratio Prot	0.01	0.10		c0.06	0.06		c0.09	0.34		0.13	c0.53	
v/s Ratio Perm	0.03		0.15	c0.15					0.04			0.02
v/c Ratio	0.20	0.59	0.89	0.77	0.32		1.00	0.76	0.10	0.78	1.00	0.03
Uniform Delay, d1	37.4	47.1	50.4	39.1	42.9		56.1	28.5	19.7	48.9	29.1	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.9	28.5	13.1	0.3		51.7	2.1	0.1	6.7	20.5	0.0
Delay (s)	37.8	50.0	78.9	52.2	43.2		107.9	30.6	19.8	55.7	49.6	14.0
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		66.6			46.6			43.9			50.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	178	346	193	156	155	285	1114	143	429	1755	46
Future Volume (veh/h)	46	178	346	193	156	155	285	1114	143	429	1755	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	49	189	219	205	166	37	303	1185	93	456	1867	44
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	304	281	225	259	528	115	315	1671	745	549	1923	858
Arrive On Green	0.05	0.15	0.14	0.08	0.18	0.18	0.09	0.47	0.47	0.16	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1753	2856	622	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	49	189	219	205	100	103	303	1185	93	456	1867	44
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1729	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	2.7	11.5	16.5	10.0	5.9	6.2	10.6	31.9	4.0	15.3	60.9	1.6
Cycle Q Clear(g_c), s	2.7	11.5	16.5	10.0	5.9	6.2	10.6	31.9	4.0	15.3	60.9	1.6
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	304	281	225	259	323	320	315	1671	745	549	1923	858
V/C Ratio(X)	0.16	0.67	0.97	0.79	0.31	0.32	0.96	0.71	0.12	0.83	0.97	0.05
Avail Cap(c_a), veh/h	366	281	225	259	323	320	315	1671	745	663	1927	859
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	48.2	51.2	41.3	42.2	42.5	54.2	25.0	17.6	48.8	26.6	13.0
Incr Delay (d2), s/veh	0.2	6.2	52.6	15.3	0.5	0.6	40.8	1.4	0.1	7.4	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.8	9.7	2.3	2.6	2.7	6.2	12.8	1.4	7.0	26.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	54.3	103.8	56.6	42.8	43.1	95.0	26.4	17.7	56.3	40.8	13.0
LnGrp LOS	D	D	F	E	D	D	F	C	B	E	D	B
Approach Vol, veh/h		457			408			1581			2367	
Approach Delay, s/veh		76.5			49.8			39.0			43.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.1	60.8	14.0	22.0	15.0	68.9	9.8	26.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	22.0	52.0	9.0	17.0	10.0	64.0	9.0	17.0
Max Q Clear Time (g_c+I1), s	17.3	33.9	12.0	18.5	12.6	62.9	4.7	8.2
Green Ext Time (p_c), s	0.7	7.9	0.0	0.0	0.0	1.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	45.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	42	0	0	88	0	1451	74	0	2229	60
Future Vol, veh/h	0	0	42	0	0	88	0	1451	74	0	2229	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	0	0	44	0	0	92	0	1511	77	0	2322	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1161	-	-	794	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.96	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.33	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	187	0	0	333	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	187	-	-	333	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	19.9	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	187	333	-	-
HCM Lane V/C Ratio	-	-	0.234	0.275	-	-
HCM Control Delay (s)	-	-	30	19.9	-	-
HCM Lane LOS	-	-	D	C	-	-
HCM 95th %tile Q(veh)	-	-	0.9	1.1	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	87	66	50	55	35	50
Future Vol, veh/h	87	66	50	55	35	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	126	96	72	80	51	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	460	112
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1429	-	-	-	563	947
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1429	-	-	-	511	947
Mov Cap-2 Maneuver	-	-	-	-	511	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	SB
HCM Control Delay, s	4.4	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	701
HCM Lane V/C Ratio	0.088	-	-	-	0.176
HCM Control Delay (s)	7.8	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	94	98	5	4	7
Future Vol, veh/h	7	94	98	5	4	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	10	136	142	7	6	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	149	0	-	0	302	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1432	-	-	-	694	906
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	877	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1432	-	-	-	688	906
Mov Cap-2 Maneuver	-	-	-	-	688	-
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	877	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1432	-	-	-	812
HCM Lane V/C Ratio	0.007	-	-	-	0.02
HCM Control Delay (s)	7.5	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	98	103	1
Future Vol, veh/h	1	0	0	98	103	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	1	1	8	8
Mvmt Flow	1	0	0	144	151	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	296	152	152	0	-	0
Stage 1	152	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	695	894	1435	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	883	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	695	894	1435	-	-	-
Mov Cap-2 Maneuver	695	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1435	-	695	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

PIONEER DESIGN GROUP, INC.
CIVIL LAND USE PLANNING SURVEY
P 503.643.8286 F 844.715.4743 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

Exhibit G – Sheet P7.0, Future Conceptual Connectivity Plan

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LEGEND

- PROPOSED PEDESTRIAN CIRCULATION
- EXISTING PEDESTRIAN CIRCULATION
- PROPOSED VEHICULAR / BICYCLE CIRCULATION
- EXISTING VEHICULAR / BICYCLE CIRCULATION
- PROPOSED SUBDIVISION PROPERTY LINES
- PROPOSED SUBDIVISION BOUNDARY
- EXISTING PROPERTY LINES

N

SCALE
0 100 200
1 INCH = 200 FEET

Project	CEDAR CREEK GARDENS		
No.	285-021		
Type	PLANNING		
Sheet			

No.	Date	Revision	By

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P7.0circ.dwg

CONCEPTUAL FUTURE CONNECTIVITY PLAN

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
PORTLAND, OREGON PH: 503.643.8286 | HONOLULU, HAWAII PH: 808.753.2376
WWW.PD-GRP.COM

Exhibit A26

PIONEER DESIGN GROUP, INC.
CIVIL LAND USE PLANNING SURVEY
P 503.643.8286 F 844.715.4743 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

January 13, 2022

Mr. Stacy Shetler, P.E.
County Engineer
Washington County
Department of Land Use and Transportation
1400 SW Walnut St., Ste 212, MS 17A
Hillsboro, Oregon 97123

RE: **Cedar Creek Gardens – 41-Lot Subdivision – TIA Study Intersection 5**
Design Exception Request for local street access to a County arterial road.

WASHINGTON COUNTY ROAD DESIGN AND CONSTRUCTION STANDARDS
REQUEST FOR EXCEPTION

The following is a request for exception as per Section 501.8.5.B.4 of the Washington County Community Development Code Standards.

Reason: Shared driveway access to SW Brookman Road, currently designated as a County arterial on the Washington County Transportation System Plan (TSP), is proposed. The subject development is a 41-Lot subdivision of Tax Lots 102 & 107, Tax Map 3S1 06, located within the Brookman Road Concept Plan area of the City of Sherwood (the City) (see Exhibit A - Location Map, attached). As a result of the location of Cedar Creek, along with several unnamed tributaries flowing through the site, the site is divided into 3 distinct and isolated developable areas (see Exhibit B – Fig. 4, Site Plan, and Exhibit C – Sheet P3.0, Preliminary Plat, attached). Of the 3 developable areas, the northwest portion of the site will support 8 lots, all of which will be accessed from the west via local public streets within the proposed Reserve at Cedar Creek Subdivision (under construction, no Design Exception Request required); 31 of the lots will obtain access to SW Brookman Road to the south via a new interior local public street system (see *Cedar Creek Gardens – 41-Lot Subdivision – TIA Study Intersection 4*, submitted concurrently); and 2 of the proposed lots will access SW Brookman Road to the north east via a shared driveway. The north eastern access, identified as T.I.A. Study Intersection 5, is the subject of this request.

As a result of the location of the existing Cedar Creek alignment, wetlands, vegetated corridor, 100-year floodplain, and existing development patterns, this north-eastern portion of the site (Proposed Lots 40 and 41) has no alternative access other than that which is proposed to SW Brookman Road. While the terminus of SW Redfern Place abuts this portion of the site, the adopted

Brookman Addition Concept Plan identifies Redfern Drive as an area of special concern, appropriate for bicycle, pedestrian, and emergency access only due to the constraint of the existing street design. The 2020 Addendum to the Brookman Addition Concept Plan did not alter this access restriction. Adding a collector or arterial street is impracticable for this limited internal street system, and as such a shared driveway connection to SW Brookman Road is being proposed.

Comparison: The existing standard states that "*Direct access to arterial roads shall be from collector or other arterial streets. Exceptions for local streets and private accesses may be allowed through a Type II process when collector access is found to be unavailable and impracticable by the Director.*" As described above, it is proposed to access SW Brookman Road, a County arterial road, with a new shared driveway access. Despite the site being located within the incorporated area of the City of Sherwood, SW Brookman Road remains under Washington County (the County) jurisdiction, and therefore this design exception is being requested from the County as part of preparing a complete Type III land use application process for submittal to the City.

The Brookman Addition Concept Plan indicated that SW Brookman Road would serve as a Collector roadway, to provide access to future development within the area. No formally identified location for the Southern Arterial has been established since the adoption of the Brookman Addition Concept Plan, therefore, under the County TSP this area remains as a refinement area (see Exhibit D – Functional Classification, Urban Area Map 6 of 6, attached). In the interim, the County TSP anticipates these residential access requests, noting that *……while refinement planning has not yet been completed, access spacing and other requirements will need to be evaluated on a case-by-case basis at the time of any development application*.

The City of Sherwood recently completed and adopted the 2020 Addendum to the Brookman Addition Concept Plan (the Addendum). As part of the Addendum, which involved coordination with Washington County, ODOT, and Metro, the City developed 3 alternative designs for the Eastern Subarea, which includes the proposed shared driveway access. The alternatives included retaining the existing alignment; the central alignment proposed in the original Brookman Addition Concept Plan; and a new southern alignment. Ultimately, the Addendum recommends that the southernmost alignment option is preferred due to existing grades, and having the least impact to existing residential development (see Exhibit E –

Exhibit A27

Figure 13: Eastern Alignment Options). The alignment also remains consistent with the Refinement Area in the County TSP. As a result, while the proposed shared driveway currently accesses SW Brookman Road as an arterial, with future alterations to the alignment of SW Brookman Road, the Brookman Addition Concept Plan anticipates the access will ultimately be to a local street (See Exhibit F – Brookman Addition Concept Plan—Final Report. Figure 5 Functional Street Classification, attached), and no design modification would be required at that time.

Documentation: The proposed connection to SW Brookman Road is identified in the City of Sherwood Transportation System Plan as a Conceptual Street Connection (See Exhibit G – Figure 18, Local Street Connectivity, attached).

The Significant Natural Resource areas demonstrated within Exhibit B also identify that the proposed site plan minimizes the incursion into the existing VC and wetlands, and that no other practicable alternative development patterns exist to avoid further disturbance.

A Traffic Impact Analysis (T.I.A) (see Exhibit H - Cedar Creek Gardens Subdivision Transportation Impact Analysis, attached) was completed by Lancaster Mobley analyzing the proposed intersection, which is noted as intersection "5". As described in the T.I.A., *All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek {Gardens] Subdivision.*

Public Safety: The proposed access location meets the Washington County Access spacing standards along an arterial street in both directions, with the exception of several single-family residential driveways. All driveways, however, will meet the required access spacing with the realignment of SW Brookman Road, as described above and shown in Exhibit E. The proposed intersection will meet the requirements of the Washington County Road Design and Construction Standards, including payment of any required funds into a Trust and Agency account in-lieu of construction as necessary given the interim nature of the current alignment. The design exception will not decrease the public safety of the intersection.

Performance: The design exception is anticipated to have minimal to no effect on the operation and functionality of SW Brookman Road and the intersection with the new shared driveway. As described in the T.I.A., no significant trends or crash patterns were identified at any of the study intersections

trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.

The T.I.A also found that adequate sight distance is available. As described in the T.I.A., *At the shared driveway access on SW Brookman Road, the posted speed is 25 mph. For the sight distance assessment, the speed of approaching vehicles was assumed to be 25 mph due to the curvature of the roadway. At 25 mph, the recommended ISD is 280 feet and the required ISD is 155 feet.*

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 280 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

All study intersections are projected within the T.I.A. to operate acceptably per their respective jurisdictional standards by year 2024 with buildout of the proposed subdivision, with no operational mitigation necessary.

Exhibits:

Exhibit A – Location Map
Exhibit B – Fig. 4, Site Plan
Exhibit C – Sheet P3.0, Preliminary Plat
Exhibit D – Functional Classification, Urban Area Map 6 of 6
Exhibit E – Figure 13: Eastern Alignment Options
Exhibit F – Brookman Addition Concept Plan—Final Report. Figure 5 Functional Street Classification
Exhibit G – Figure 18, Local Street Connectivity
Exhibit H – Cedar Creek Gardens Subdivision Transportation Impact Analysis
Exhibit I – Sheet P7.0, Future Conceptual Connectivity Plan

Sincerely,
Pioneer Design Group, Inc.

Brent Fitch, P.E.
Principal

PIONEER DESIGN GROUP, INC.
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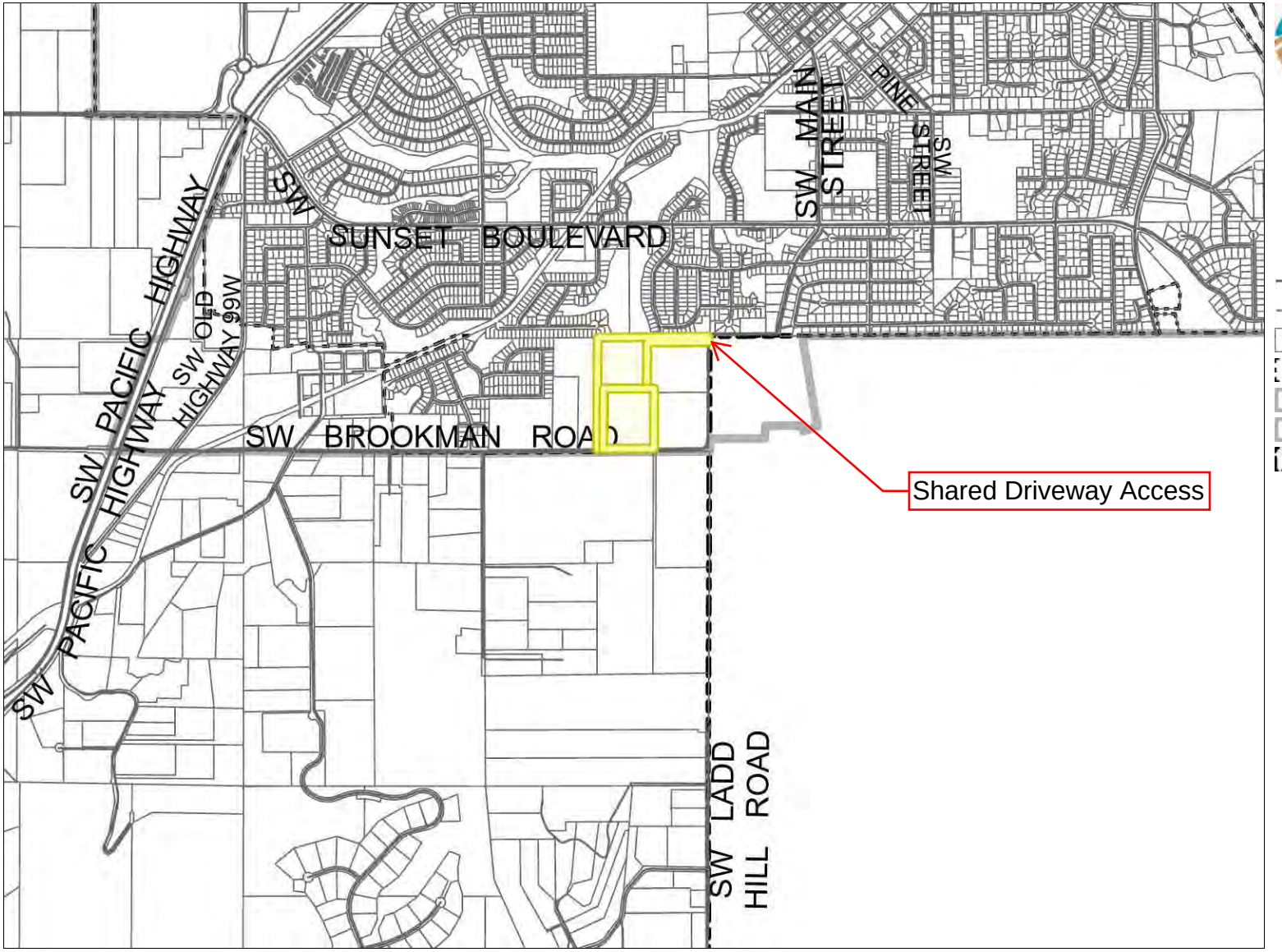
Exhibit A – Location Map

Exhibit A27

WASHINGTON COUNTY
OREGON

Map Title



Street Names
Arterials
All Streets
Parcels
City Limits
Regional Urban Growth Boundary
Non-Regional Urban Growth Boundaries
Washington County Boundary

1: 31,680

1 inch = 2,640 feet

0 660 2,640 5,280 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

Notes

1/5/2022

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Exhibit B – Fig. 4, Site Plan

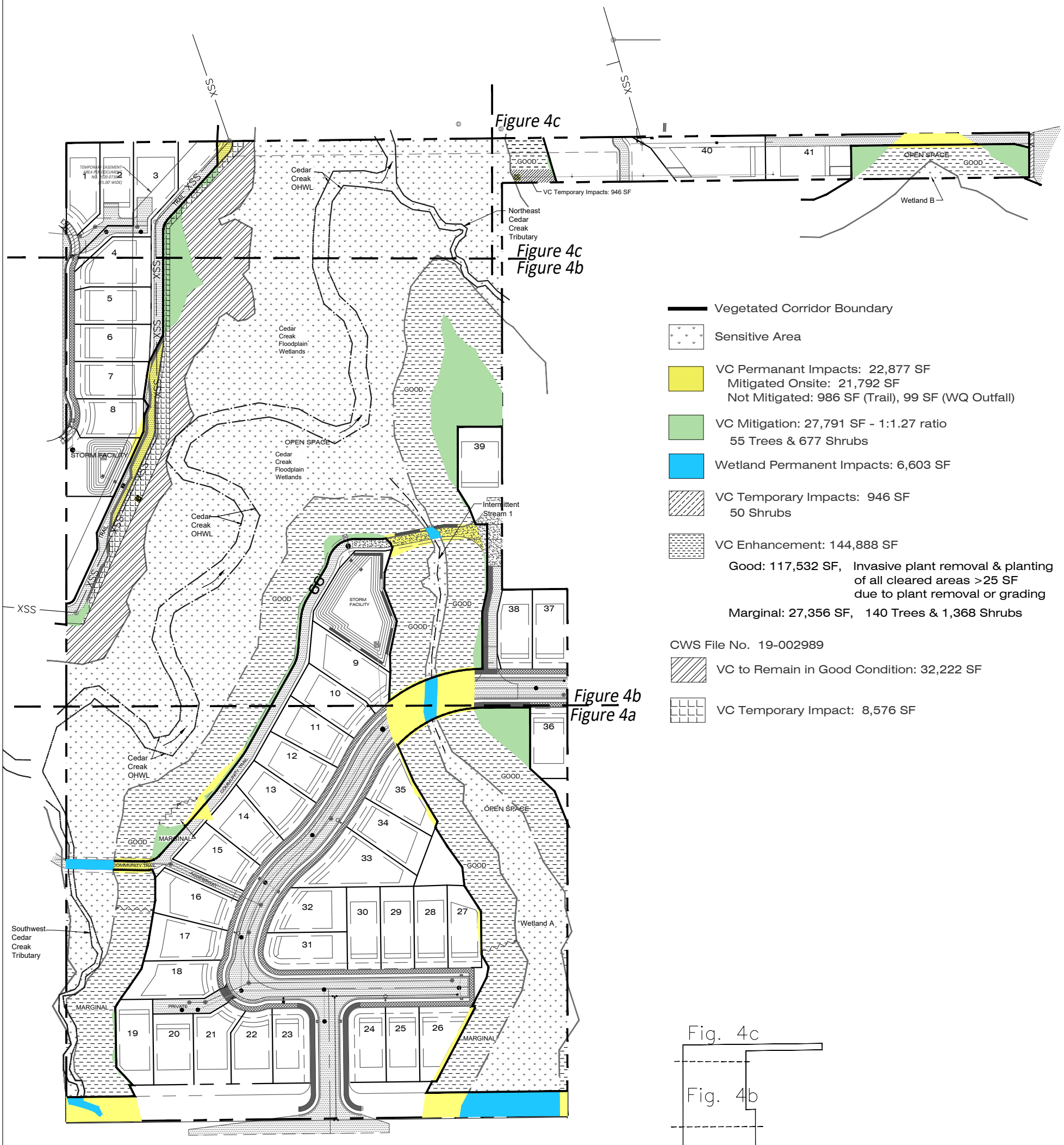

Fig. 4

Rev: 4/22
Job: 21004
Date: 10/21
Mod. By: KR

Base Map Source: Pioneer Design Group, Inc.

N
1"=140'
0 75 140

Site Plan
Cedar Creek Gardens
Sherwood, Oregon

Environmental Science & Assessment, LLC
4831 NE Fremont St., Suite 2B
Portland, OR 97213
Phone: 503.478.0424
www.esapdx.com

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Exhibit C – Sheet P3.0, Preliminary Plat

Exhibit A27

MATCHLINE - SEE THIS SHEET

"ARBOR LANE"

EXISTING TRAIL

100 YR FP

TRACT I
OPEN SPACE
8660 SF

15.00' SANITARY EASEMENT TO CWS

12.00' SHARED ACCESS EASEMENT FOR LOTS 40-41

SHARED DRIVEWAY

40
8648 SF

41
10572 SF

TRACT H
OPEN SPACE
10617 SF

15.00' PUBLIC WATER EASEMENT

20.00' COMMUNITY TRAIL

VC BOUNDARY

WETLAND BOUNDARY

SW BROOKMAN ROAD

WETLAND BOUNDARY

20.00' VACTOR TRUCK TURN AROUND EASEMENT

VC BOUNDARY

39
11083 SF

TRACT D
OPEN SPACE
79478 SF

FIRE TRUCK TURN AROUND TEMPLATE

20.00' MAINTENANCE ACCESS, PEDESTRIAN, AND BICYCLE EASEMENT

TRACT B
OPEN SPACE

TRACT C
STORM
FACILITY
11167 SF

STREET 'B'

STREET 'A'

TRACT E
557 SF

TRACT F
3529 SF

TRACT G
1990 SF
PRIVATE ACCESSWAY

15.00' PEDESTRIAN AND BICYCLE ACCESS EASEMENT

SS EASEMENT TO COMMUNITY TRAIL

432585 SF

MATCHLINE - SEE THIS SHEET

TRACT 'A'

20.00' TRAIL EASEMENT

WETLAND BOUNDARY

VC BOUNDARY

TRACT B
OPEN SPACE

COMMUNITY TRAIL

TRACT A
STORM
FACILITY
6445 SF

SW YAMEL TERRACE

SCALE
60 0 30 60
1 INCH = 60 FEET

B:\Projects\285-021-19\Planning\28521_P3.0plat.dwg 4/29/2022 4:58:44 PM

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CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
PORTLAND, OREGON | HONOLULU, HAWAII
PH: 503.643.8286 PH: 808.753.2276
WWW.PD-GRP.COM

PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P3.0plat.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.0

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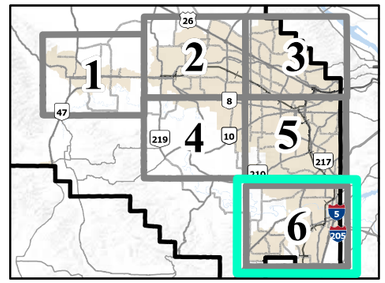
Exhibit D – Functional Classification, Urban Area Map 6 of 6

Washington County Transportation System Plan

Roadway Element



Functional Classification

Urban Area Map 6 of 6

- Freeway
- Principal Arterial
- Arterial
- Collector
- Neighborhood Route
- Proposed Arterial
- Proposed Collector
- Proposed Neighborhood Route
- Refinement Area
- Urban Area
- County Boundary
- Other Roads

0 2,000 4,000
Feet

1 inch equals 3,500 feet

N

Online Map: http://bit.ly/FunctionalClass

Department of Land Use & Transportation
Planning and Development Services Division

This map displays an unofficial representation of elements adopted as part of Washington County Transportation System Plan. It is not to be considered as official. Please contact Washington County Long Range Planning at (503) 846-3519 with any questions regarding this map.

\\Emcgis\nas\GISDATA\Workgroups\GISPlanning\COMP_PLAN\Transportation_Plan\TSP_ReferenceGuide_Maps\TSP_ReferenceGuide_Maps.aprx Date Exported: 9/25/2019

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Exhibit E – Figure 13: Eastern Alignment Options

CENTRAL SUBAREA

The 2009 Concept Plan's central subarea was designed to be a walkable residential area that allows a mix of housing types while maintaining a lower residential density. Brookman Road would provide the primary east-west access at the southern edge of the neighborhood.

Within this area, the general alignment of Brookman Road would be maintained to minimize impacts to property and natural resources. Additionally, there are sections of this subarea that are being constructed with half-street improvements as part of adjacent subdivision development.

Recommended Corridor Alignment

This refinement plan recommends maintaining the existing road alignment. Future road construction and widening would analyze mitigation options such as a retaining wall or other measures to minimize right-of-way acquisition. Some newly approved subdivisions are already building half-street improvements on portions of the north side of Brookman Road while others are paying a fee-in-lieu for improvements that would be placed in a dedicated fund for future improvements.

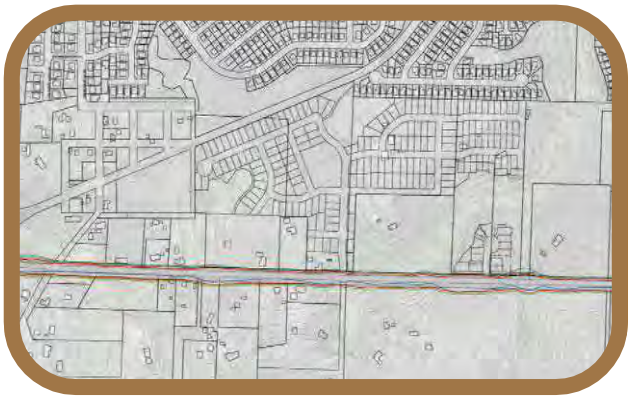

Figure 11: Central Subarea Closeup

EASTERN SUBAREA

Bordered by Cedar Creek to the west and Ladd Hill Road to the east, the eastern subarea is designated for single-family detached dwelling units. SW Brookman Road would still provide primary east-west access to the neighborhood with enhanced pedestrian and bicycle facilities. Currently, the eastern section of Brookman Road curves sharply to the north, traveling approximately 1,300 feet before curving sharply to the east past existing homes and connecting to Ladd Hill Road. Under the 2009 Concept Plan, SW Brookman Road would veer south to avoid using the narrow road past existing homes and that second sharp turn.

Recommended Corridor Alignment

This refinement plan recommends Alignment Option 3, which shifts the northern curve to south and shortens the connection to Ladd Hill Road. This would flatten out the first sharp curve and minimize impacts to existing residences, but would require new right-of-way acquisition to make the new connection to Ladd Hill. This recommended alignment is not currently shown in the Clackamas County TSP.

Figure 12: Eastern Subarea Closeup

Figure 13: Eastern Alignment Options

Alignment Option 1, shown in blue, is consistent with the alignment proposed under the original Concept Plan

Alignment Option 2, shown in red, follows the alignment of Brookman Road as it exists today.

Alignment Option 3, shown in green, shows the refinement plan recommendation.

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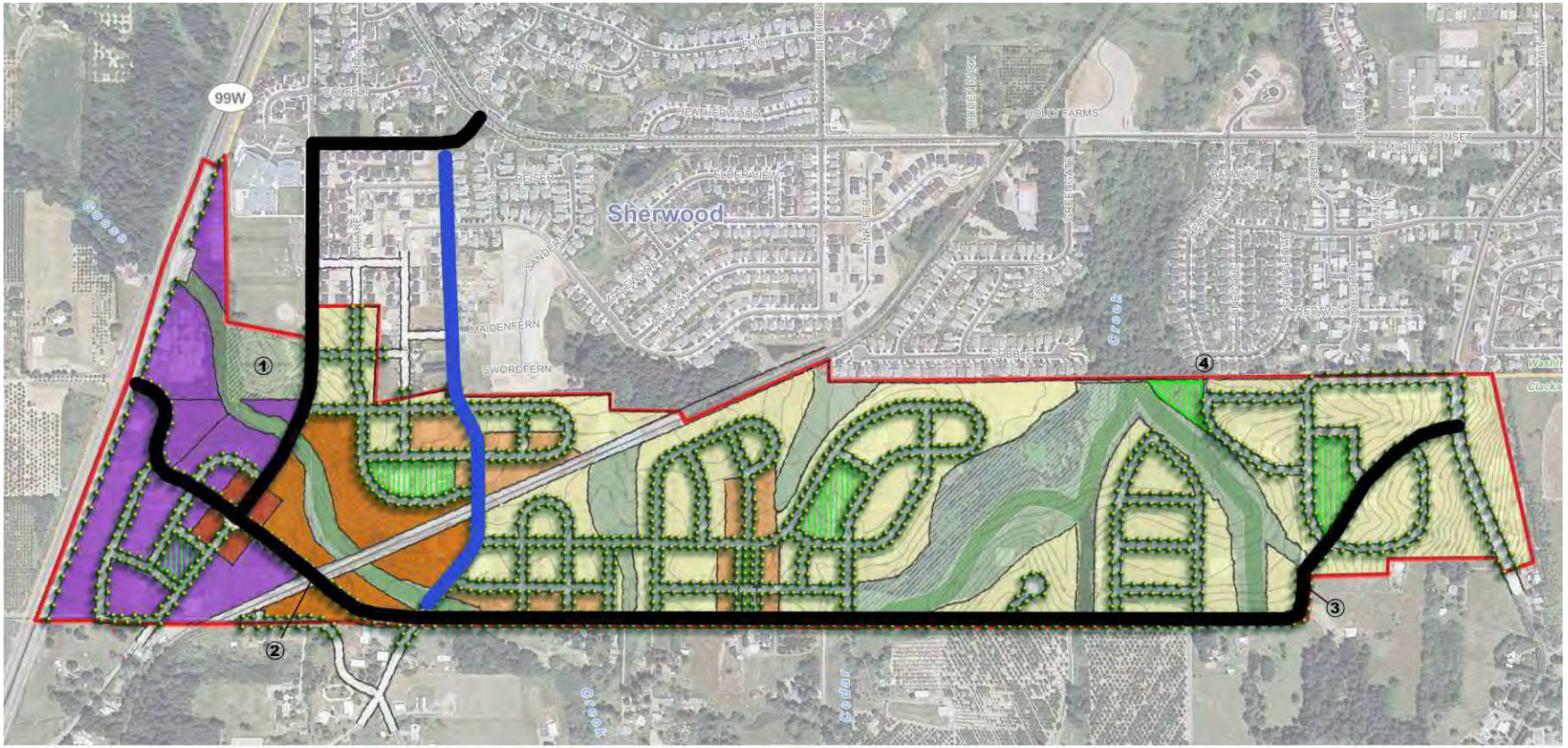
Exhibit F – Brookman Addition Concept Plan—Final Report. Figure 5 Functional Street Classification

Figure 5 Functional Street Classification



Brookman Addition Concept Plan

Functional Street Classification

Notes:
1. Existing Cemetery (Constrained Land)
2. Railroad Crossing (Grade Separated)
3. All street alignments are conceptual.
4. Redfern connection is pedestrian, bicycle and emergency access only.

0' 250' 500' 1000'

Final-May 2008

Legend

- High Density Residential 24 du/ac
- Medium Density Residential- High 11 du/ac
- Medium Density Residential- Low 8 du/ac
- Commercial / Mixed Use
- Employment
- Neighborhood Parks (Locations are conceptual)
- Constrained Lands (Goal 5 resource lands, subject to on-site verification)
- Constrained Lands (Vegetated corridor proxy, subject to on-site verification)
- Constrained Lands (Potential wetlands, subject to on-site verification)
- Collector
- Neighborhood Roads

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Exhibit G – Figure 18, Local Street Connectivity

Exhibit A27

Figure 18

Local Street Connectivity

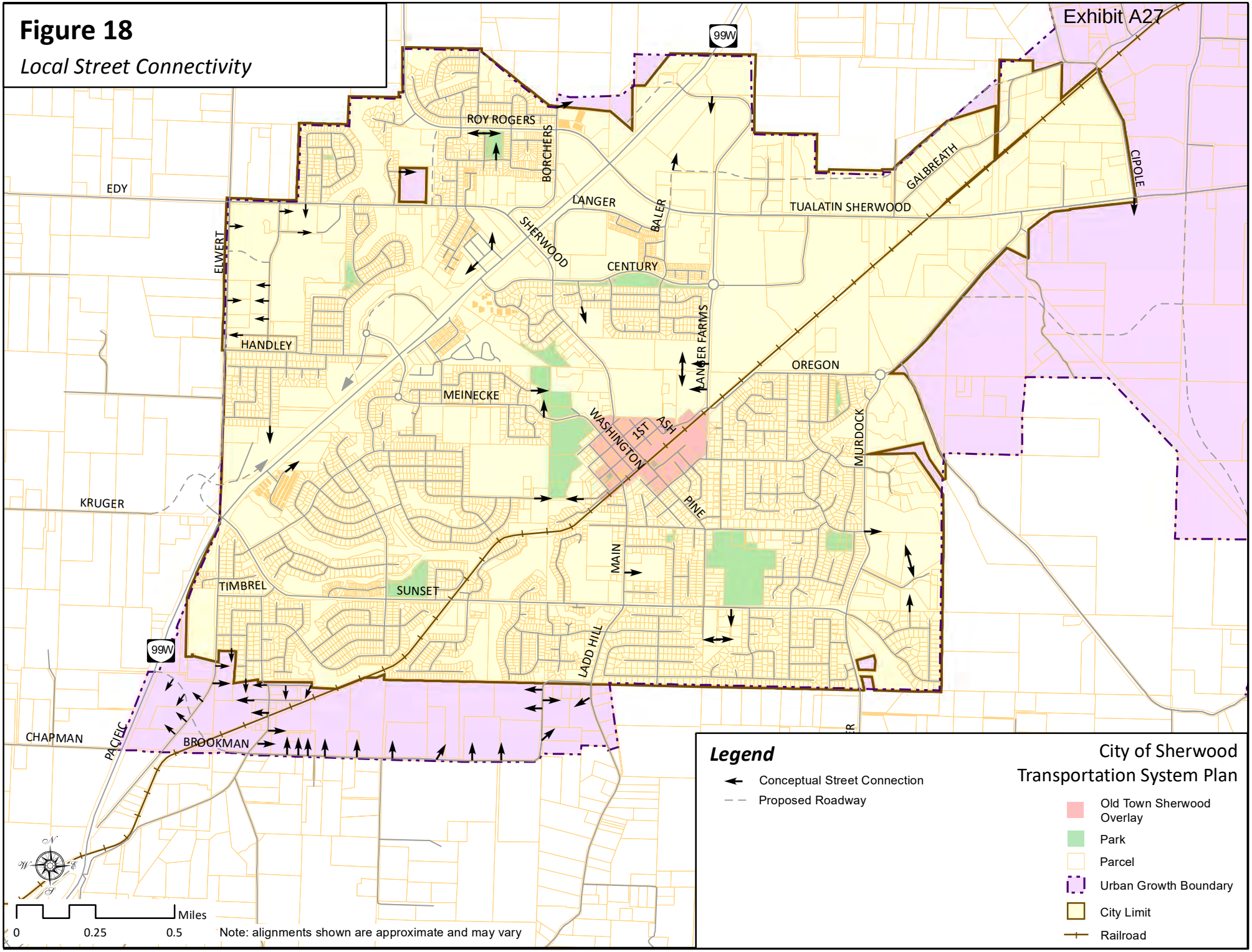

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Exhibit H – Cedar Creek Gardens Subdivision Transportation Impact Analysis

lancaster mobley

Cedar Creek Gardens Subdivision

Transportation Impact Analysis

Sherwood, Oregon

Date:
November 10, 2021

Prepared for:
Westwood Homes, LLC

Prepared by:
Jennifer Danziger, PE

REGISTERED PROFESSIONAL ENGINEER
16168
Digitally signed by Jennifer Danziger
Date: 2021.11.10 13:52:55-08'00'
OREGON
SEPT. 15, 1992
JENNIFER ELISE DANZIGER

RENEWS: 12/31/2021

List of Figures

List of Tables

Executive Summary

1. The proposed Cedar Creek Gardens subdivision will redevelop the properties located at 16871 and 17033 SW Brookman Road in Sherwood, Oregon. The proposed development includes the construction of 42 single-family homes, removing two existing homes for a net increase of 40 homes. Access to the site will be provided via two public street connections and one shared driveway connection along SW Brookman Road.
2. The proposed development is projected to generate an additional 32 morning peak hour, 41 evening peak hour trips, and 426 weekday trips.
3. No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. A review of existing sight lines and elevation profiles from Google Earth show that adequate sight distance can be available if the roadside vegetation is cleared with the development. Both the intersection sight distance and stopping sight distance can be met at the main site access and the shared driveway.
5. Left-turn lane warrants are not projected to be met at the site access intersection along SW Brookman Road upon completion and occupancy of the proposed development. Accordingly, installation of a left-turn lane at the site access intersection is not necessary or recommended.
6. All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.
7. Because the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both peak hours under all scenarios, agencies may wish to consider restriping the eastbound approach to provide a through and a right-turn lane. This change would eliminate occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping. The change is not necessary to accommodate the proposed development.
8. *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019, identified four intersections as currently exceeding acceptable jurisdictional standards. Based on the projected site trip impacts to these intersections, a total proportionate share fee to mitigate impacts of $69,274.39 was calculated.

Project Description

Introduction

This report describes and evaluates the transportation impacts associated with the proposed Cedar Creek Gardens subdivision located at 16871 and 17033 SW Brookman Road in Sherwood, Oregon. The proposed development includes the construction of 42 single-family homes, removing two existing homes for a net increase of 40 homes. Access to the site will be provided via two public street connections and one shared driveway connection along SW Brookman Road.

Based on correspondence with the City of Sherwood, a safety and capacity/level of service analysis was conducted at the following intersections:

1. SW Elwert Road/SW Sunset Boulevard at Highway 99W
2. SW Brookman Road at Highway 99W
3. SW Brookman Road at Middlebrook Site Access
4. SW Brookman Road at Main Site Access
5. SW Brookman Road at North Site Access

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The subject site is located at 16871 and 17033 SW Brookman Road and is situated adjacent to one in-process residential subdivision project: The Reserve at Cedar Creek. The site is located north of SW Brookman Road with The Reserve to the west. The subject property consists of two tax lots (3S10600 00107 and 00102) totaling approximately 20 acres. Each lot has an existing single-family house on the property which will be removed upon development.

Figure 1 displays a vicinity map of the project site, with the project site hatched and outlined in yellow. Other adjacent approved developments are shown in red, blue, and cyan. The future street network is represented with white. A site plan depicting the proposed project is provided in the appendix.

The site will take access from two public street connections and one shared driveway connection along SW Brookman Road. Eight (8) of the proposed homes will have driveways connecting to a roadway to be constructed as part of The Reserve subdivision. Their access to SW Brookman Road will be via a new roadway (SW White Oak Terrace) to be constructed as part of the Middlebrook subdivision. Thirty-one (31) of the proposed homes will access SW Brookman Road via a new roadway constructed with the subject subdivision. Three (3) of the proposed homes will share a driveway that will connect to SW Brookman Road at the northeast corner of the site.

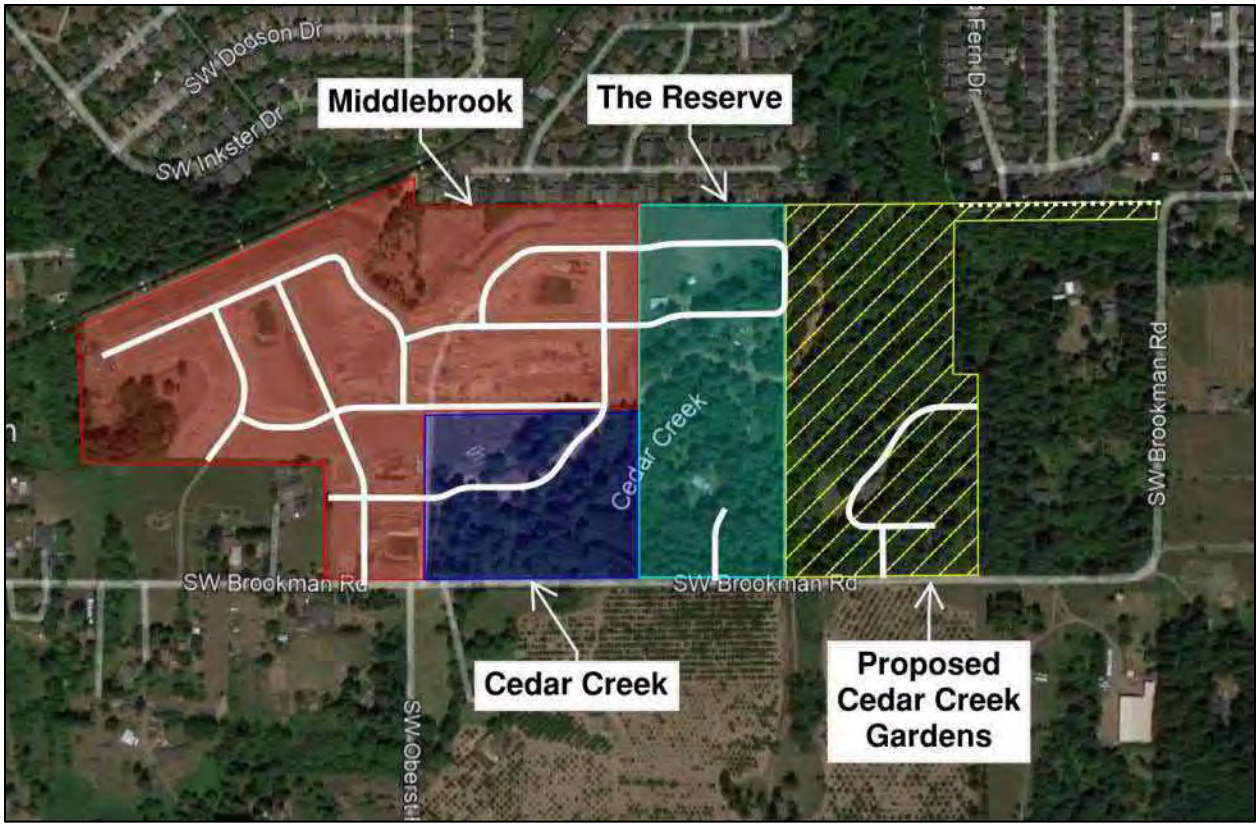


Figure 1: Project Location (image from Google Earth)

Vicinity Roadways

The proposed development is expected to impact three vicinity roadways. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Roadway	Jurisdiction	Functional Classification	Cross-Section	Speed (mph)	On-street Parking	Bicycle Lanes	Curbs & Sidewalks
Highway 99W	ODOT	Principal Arterial	4 Lanes	45-55 Posted	Not Permitted	Partial Both Sides	None
SW Elwert Rd/ SW Sunset Blvd	City of Sherwood	Arterial	2 to 3 Lanes	35 Posted	Not Permitted	Both Sides	Both Sides
SW Brookman Rd	Washington County	Arterial	2 Lanes	25/35/55 Posted/ Statutory	Not Permitted	None	None

Notes: Functional Classification based on the City of Sherwood Transportation System Plan

Study Intersections

The proposed development is expected to impact three vicinity intersections of significance. A summarized description of the study intersections is provided in Table 2.

Table 2: Study Intersection Descriptions

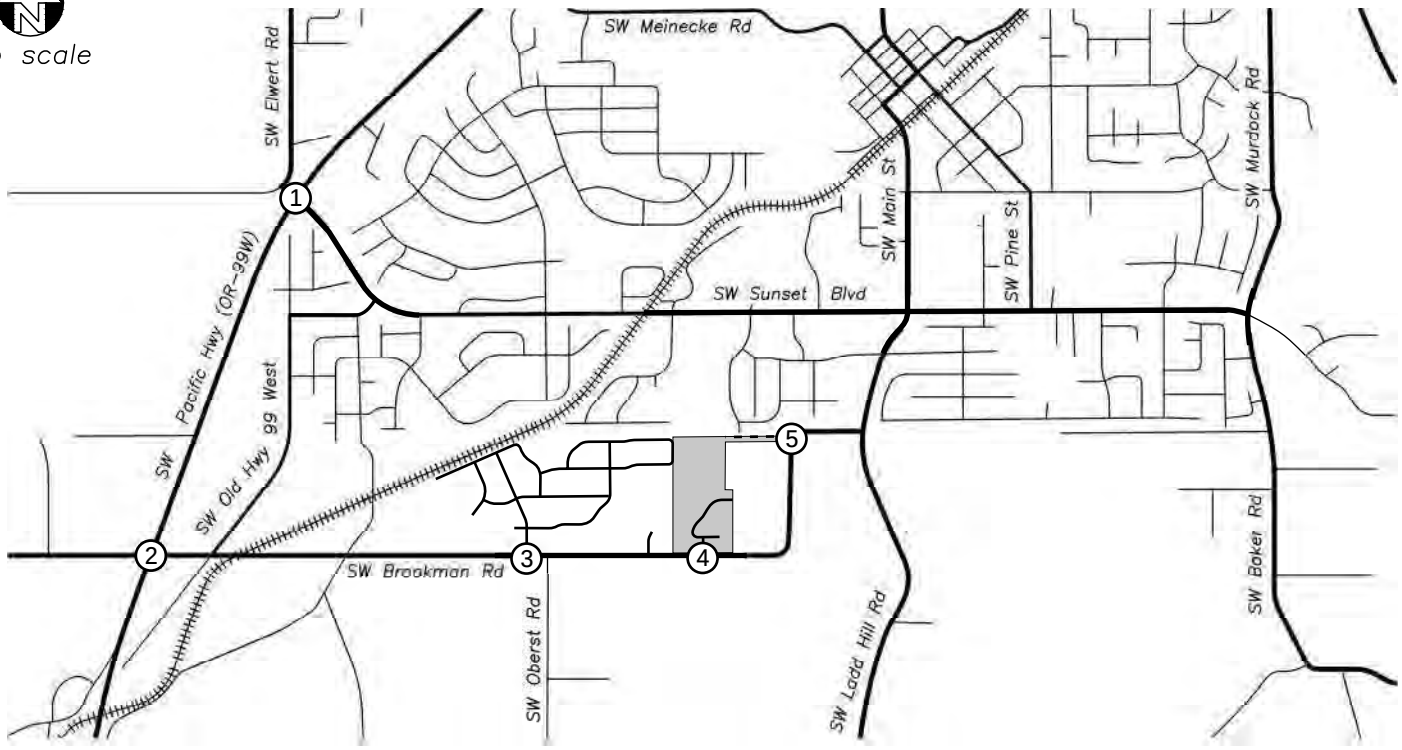
Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	SW Elwert Rd/SW Sunset Blvd at Highway 99W	Four-Legged	Signalized	WB/EB Permitted LT, NB/SB Protected LT
2	SW Brookman Rd at Highway 99W	Four-Legged	Stop-Controlled	EB/WB Stop Controlled Approach
3	SW Brookman Rd at Site Access	Three-Legged (Future)	Stop-Controlled	SB Stop Controlled Approach

A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.

Transit

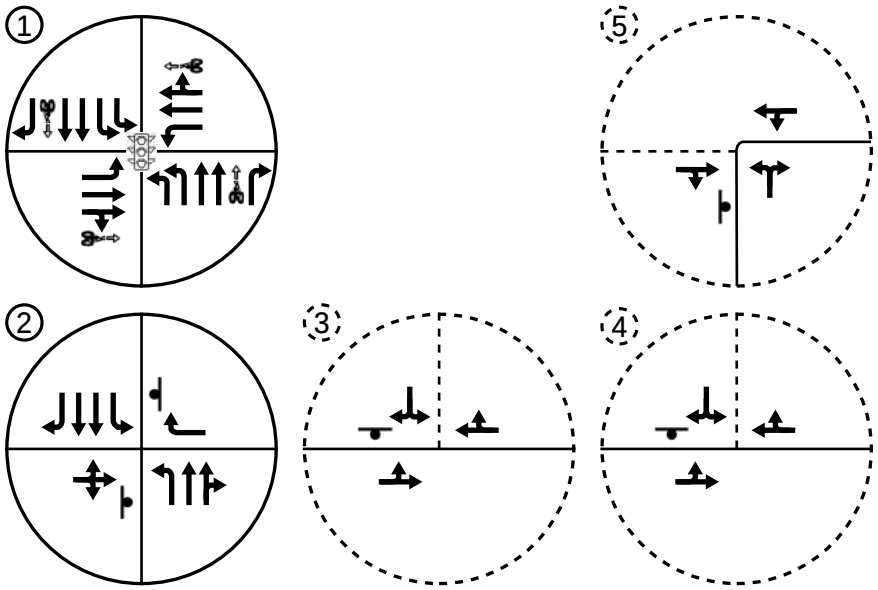
No nearby transit service is available near the proposed development.

no scale



LEGEND

- STUDY INTERSECTION (EXISTING)
- STUDY INTERSECTION (FUTURE)
- STOP SIGN
- TRAFFIC SIGNAL
- BICYCLE LANE
- PROJECT SITE
- ARTERIAL ROADWAY
- COLLECTOR ROADWAY
- LOCAL ROADWAY
- FUTURE ROADWAY
- RAILROAD TRACKS



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VICINITY MAP &
LANE CONFIGURATIONS

Figure 2
Cedar Creek Gardens
11/10/2021

Site Trips

Trip Generation

The proposed development includes the construction of 42 single-family homes. As part of the proposed development, two existing single-family homes will be removed for a net increase of 40 homes.

To estimate the number of site trips generated under existing and proposed conditions, trip rates from the *Trip Generation Manual*[1] were used. Specifically, the equations from land-use codes 210, *Single-Family Detached Housing*, were used based on the number of dwelling units.

As shown in Table 3, the trip generation calculations show that the proposed development is projected to generate an additional 32 morning peak hour, 41 evening peak hour trips, and 426 weekday trips. Detailed trip generation calculations are included in the technical appendix.

Table 3: Trip Generation Summary

Land Use	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
Proposed Development	210	42 DU	9	25	34	28	16	44	454
Existing Homes	*210*	*2 DU*	*-1*	*-1*	*-2*	*-2*	*-1*	*-3*	*-28*
Net New Site Trips			**8**	**24**	**32**	**26**	**15**	**41**	**426**

Trip Distribution

The directional distribution of site trips to/from the project site was referenced from *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019. The following trip distribution was used for analysis:

- Approximately 45 percent of site trips will travel to/from the north along Highway 99W
- Approximately 10 percent of site trips will travel to/from the north along SW Main Street
- Approximately 10 percent of site trips will travel to/from the north along SW Murdock Road
- Approximately 10 percent of site trips will travel to/from the south along Highway 99W
- Approximately 10 percent of site trips will travel to/from the south along SW Ladd Hill Road
- Approximately 10 percent of site trips will travel to/from the south along SW Baker Road
- Approximately 5 percent of site trips will travel to/from the west along SW Kruger Road

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

Four intersections were identified as exceeding acceptable operation standards in *The Reserve TIA*:

A. SW Sunset Boulevard at SW Woodhaven Drive

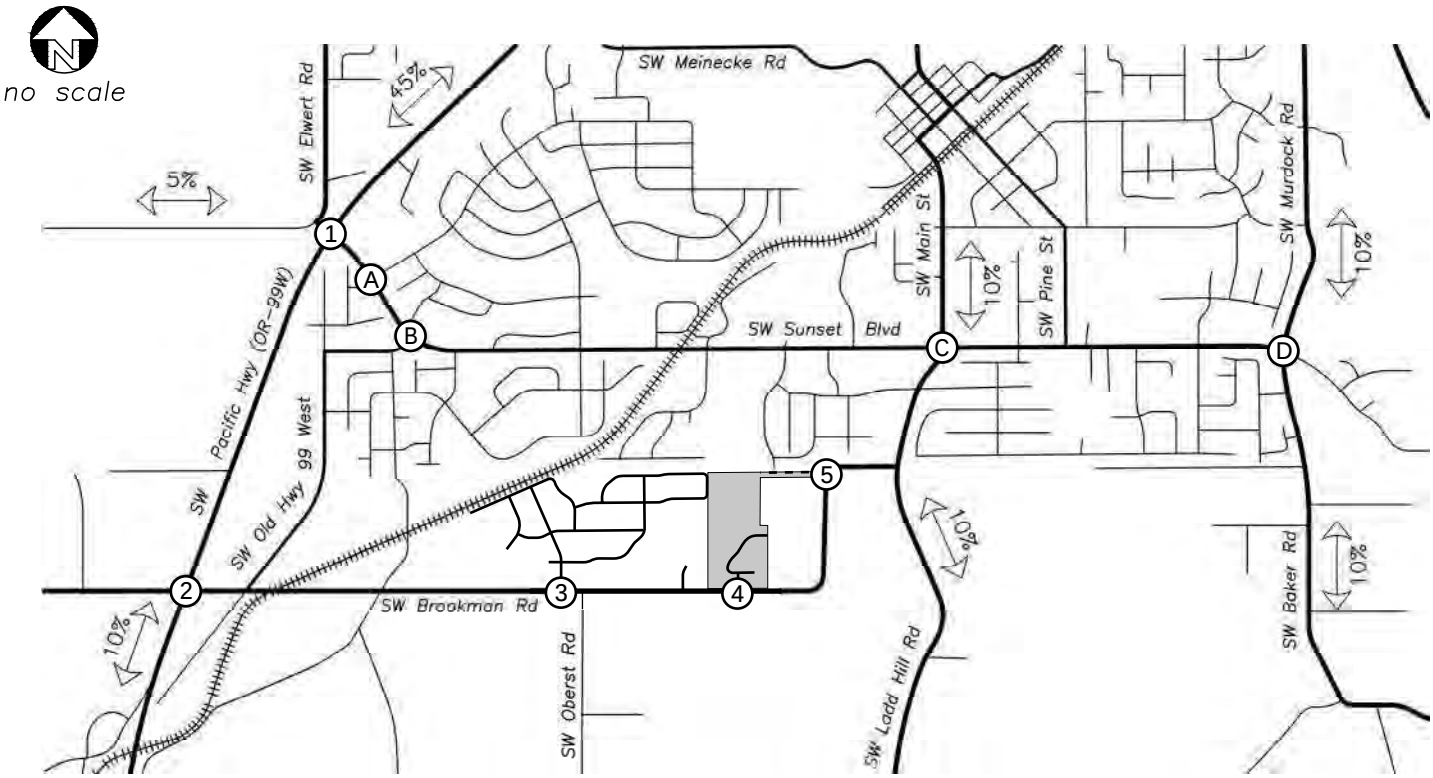
B. SW Sunset Boulevard at SW Timbrel Lane

C. SW Sunset Boulevard at SW Main Street/SW Ladd Hill Road

D. SW Sunset Boulevard at SW Murdock Road/SW Baker Road

Site trip assignment through these intersections was conducted to determine expected impacts from the proposed development to these intersections.

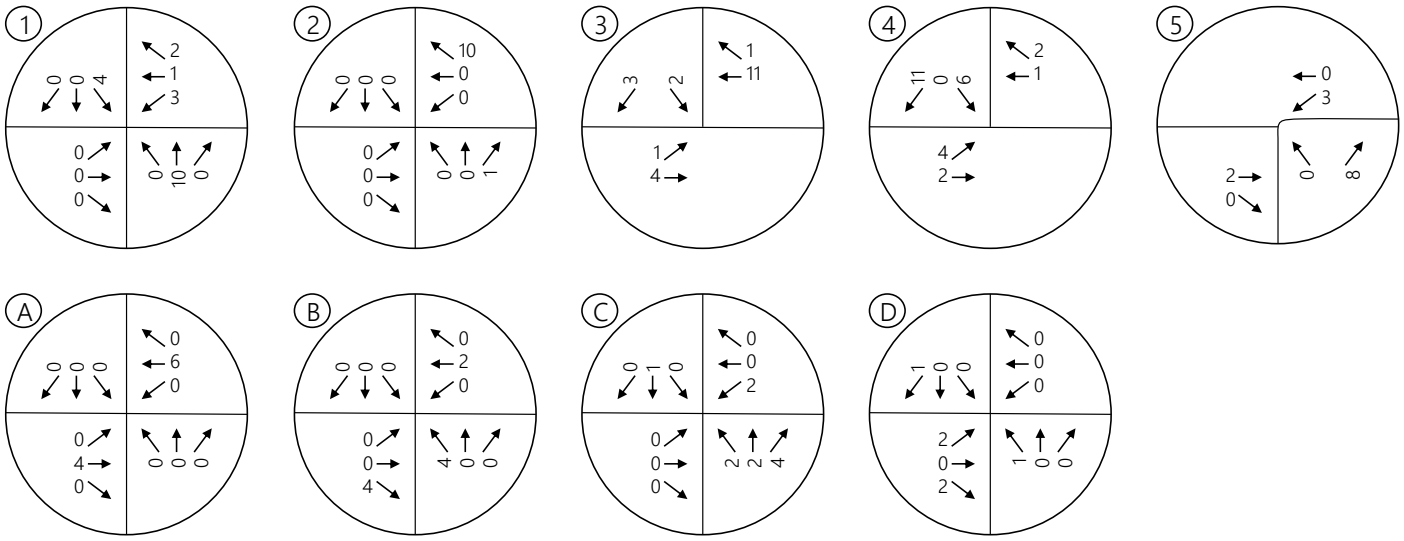
The trip assignment for site trips generated by the proposed development during is shown in Figure 3 for the morning peak hour and Figure 4 evening peak hour. This assignment reflects the layout of the proposed development with 8 homes using the Middlebrook subdivision access, 31 homes using the main site access, and 3 homes using the shared driveway.



NET TRIP GENERATION

	In	Out	Total
AM	8	24	32
PM	26	15	41
DAILY	213	213	426

AM PEAK HOUR



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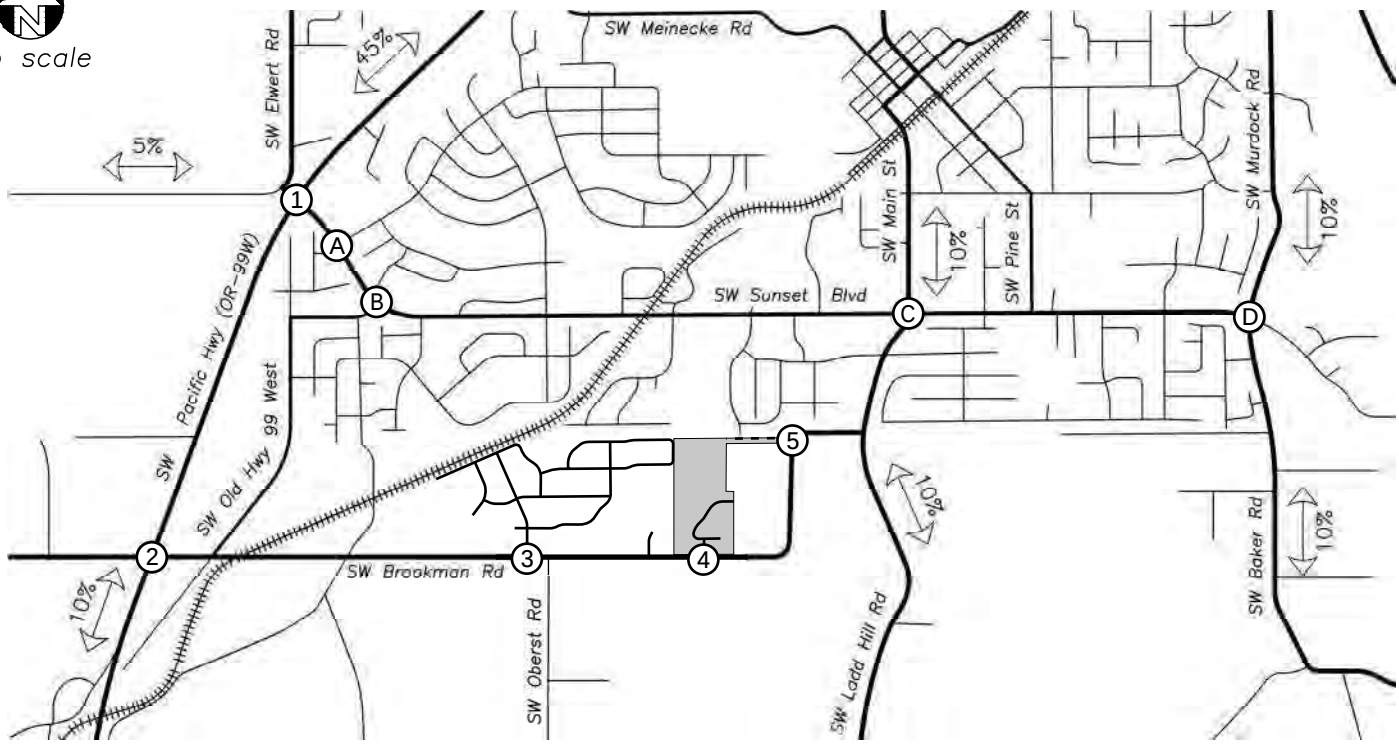
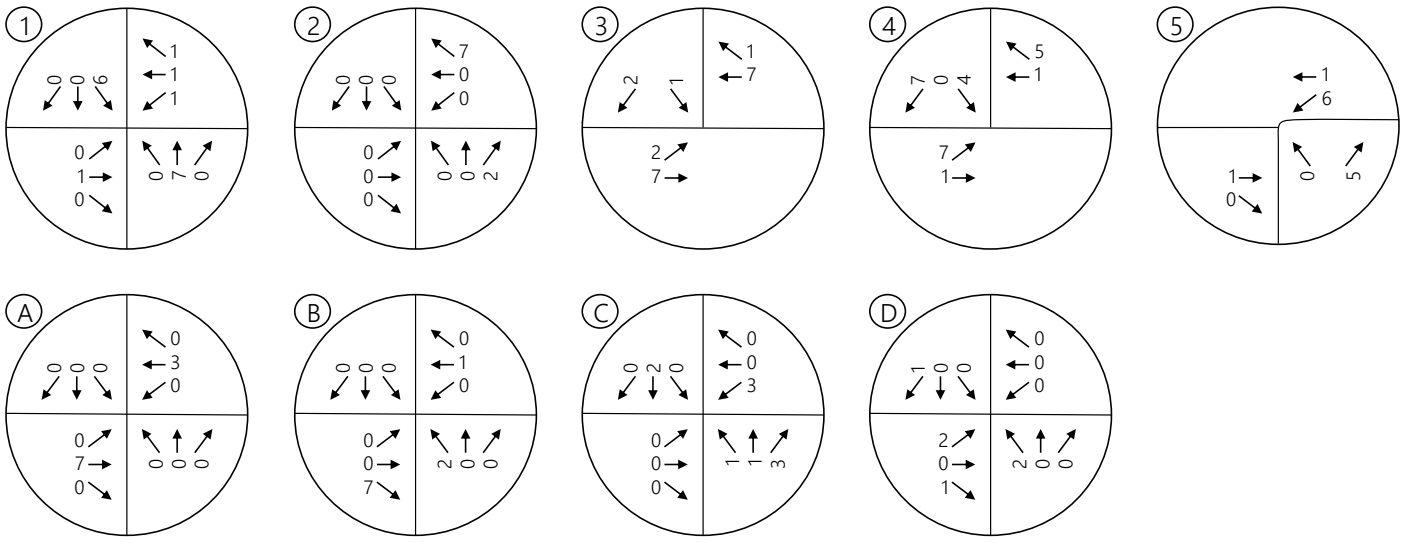


NET TRIP GENERATION

	In	Out	Total
AM	8	24	32
PM	26	15	41
DAILY	213	213	426

PM PEAK HOUR



lancaster mobley

TRIP DISTRIBUTION & ASSIGNMENT - PM PEAK

TRAFFIC VOLUMES

Figure 4
Cedar Creek Gardens
11/10/2021

Traffic Volumes

Existing Conditions

Due to the ongoing COVID-19 viral pandemic, traffic volumes have been depressed relative to normal conditions since mid-March 2020. Under these conditions, traditional traffic count data collection methods are not recommended. Therefore, to estimate existing traffic conditions, year 2017 traffic count data was referenced from *The Reserve TIA*, specifically volumes from Figures 4 and 5. Consistent with background growth methodologies used in *The Reserve TIA*, the year 2017 volumes were increased by 1% annually along Highway 99W and by 2% annually on all other movements at the study intersections to reflect existing year 2021 conditions. Note, these volumes do not capture the traffic demand from Sherwood High School, which was opened in the fall of 2021.

Since the traffic counts were collected, the westbound approach of SW Brookman Road at Highway 99W has been restricted to right turns only. The westbound left-turn and through volumes have been reassigned to reflect the traffic change. Ten percent of these movement was assumed to travel northbound to the signal at SW Sunset Boulevard and then U-Turn to travel southbound. Ninety percent was assumed to travel to SW Sunset Boulevard via other routes and turn left to travel southbound.

Figure 5 shows the existing traffic volumes at study intersections during the morning and evening peak hours.

Background Conditions

To provide analysis of the impact of the proposed development on the existing transportation facilities, an estimation of future traffic volumes is required. To reflect future traffic conditions without the proposed subdivision, volumes from two studies were used to estimate the Year 2024 background traffic volumes. *Year 2024 Total Intersection Operations* (Figures 12 and 13) volumes were referenced from *The Reserve TIA* and the trip assignments from the *Cedar Creek Subdivision TIA* (Figures 2 and 3) were added to those volumes. These volumes reflect the opening of the new Sherwood High School Campus.

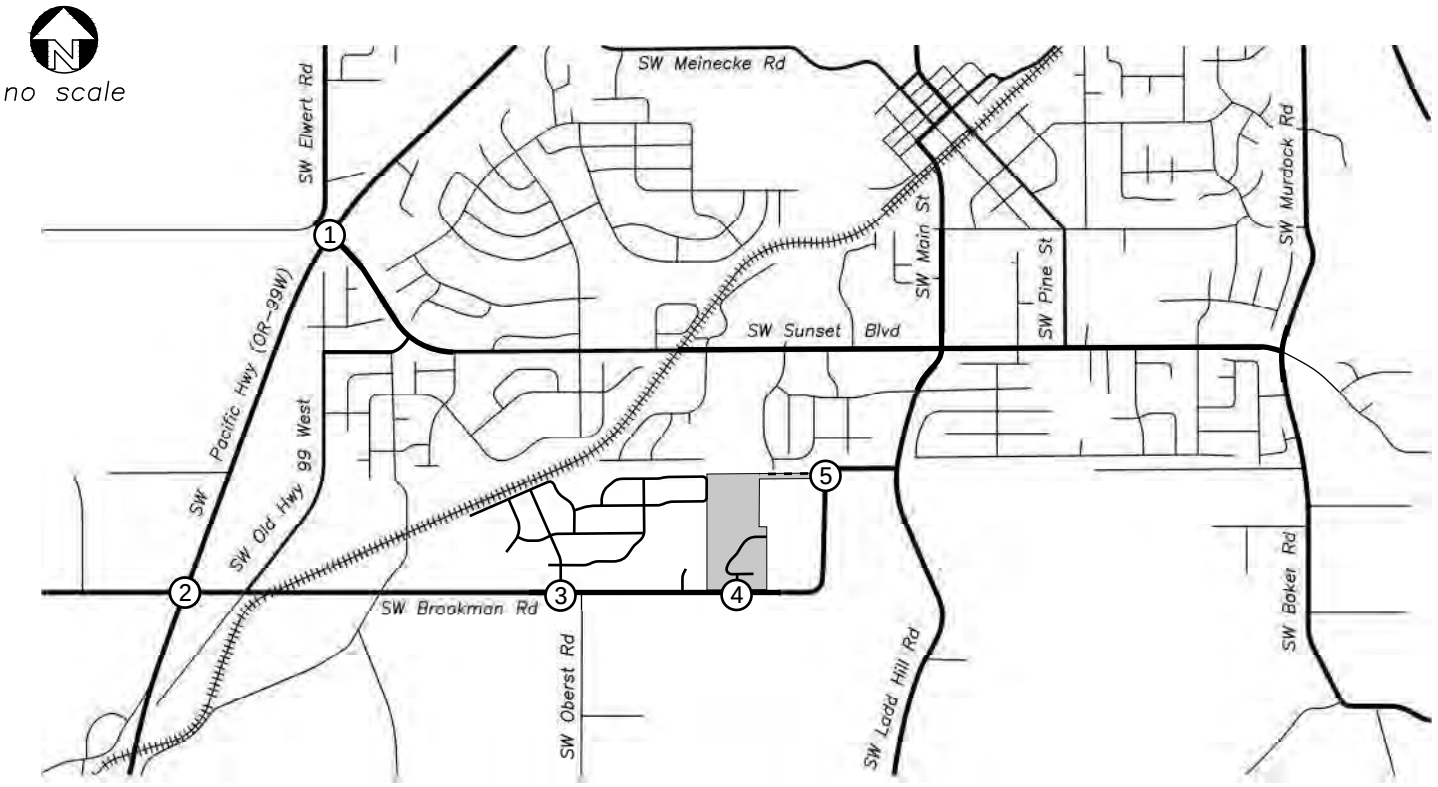
Note *The Reserve TIA* assumed additional turning movement restrictions at the intersection of SW Brookman Road at Highway 99W would be implemented by year 2024. The minor street approaches will be restricted to right-in/right-out only and U-turns along Highway 99W at the intersection would also be restricted. The volumes reflect this change.

Figure 6 shows the background traffic volumes at study intersections during the morning and evening peak hours.

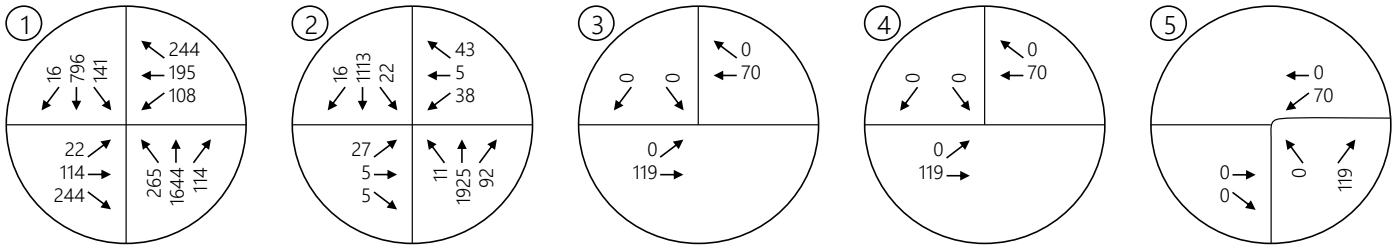
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2024 background traffic volumes to obtain the expected 2024 buildout volumes.

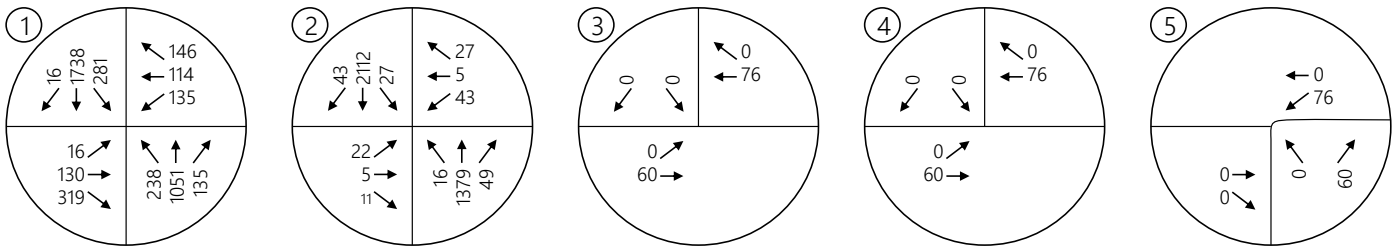
Figure 7 shows the buildout traffic volumes at study intersections during the morning and evening peak hours.



AM PEAK HOUR



PM PEAK HOUR



lancaster mobley

YEAR 2021 EXISTING CONDITIONS

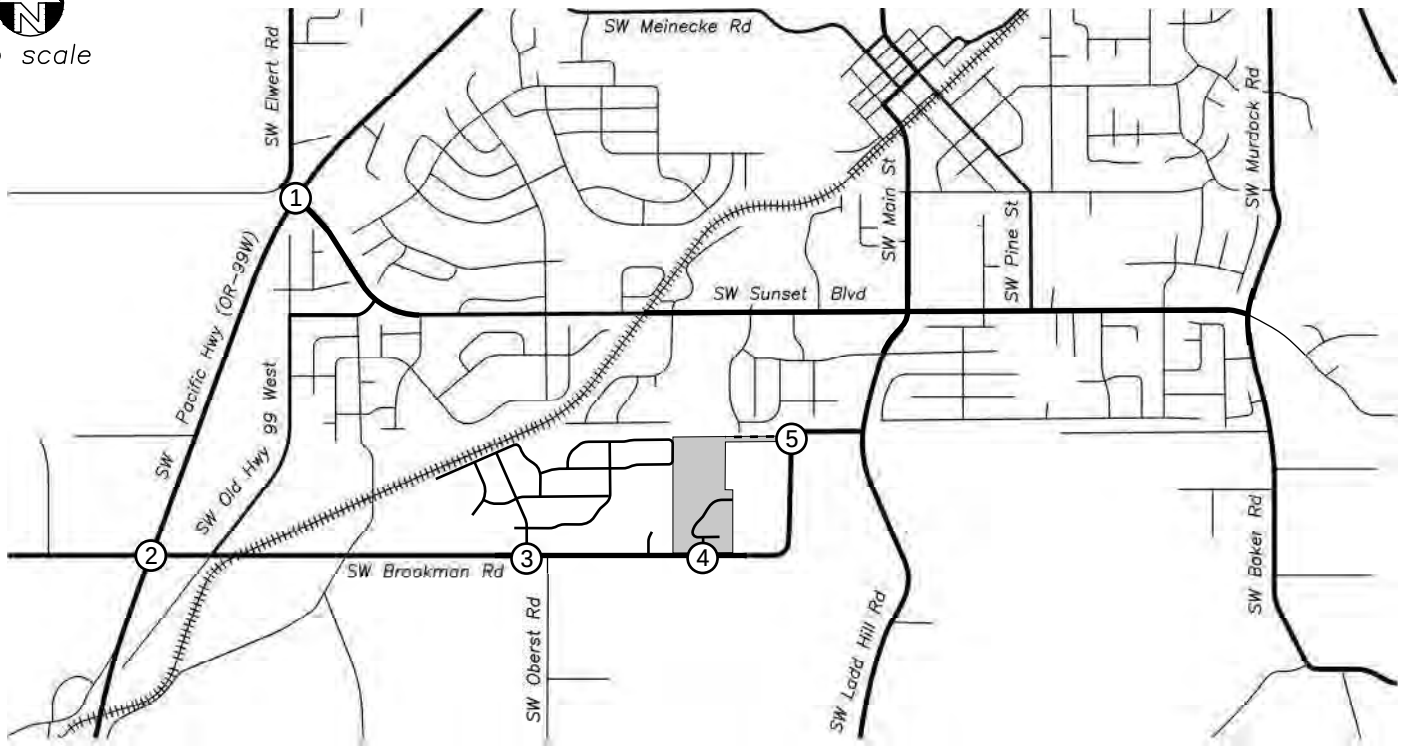
TRAFFIC VOLUMES

Figure 5

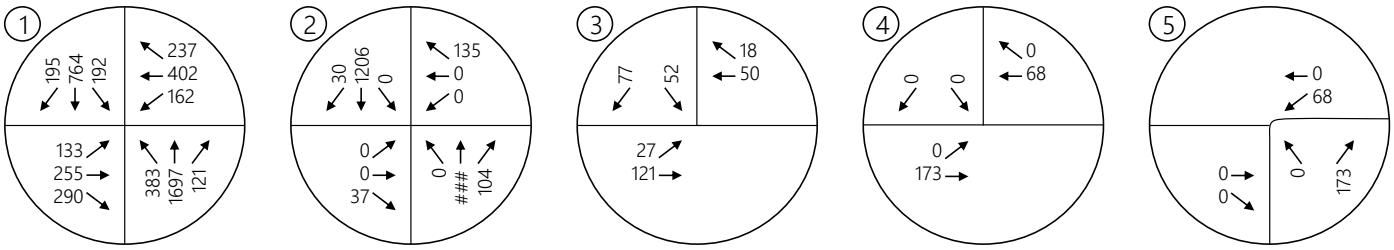
Cedar Creek Gardens

11/2/2021

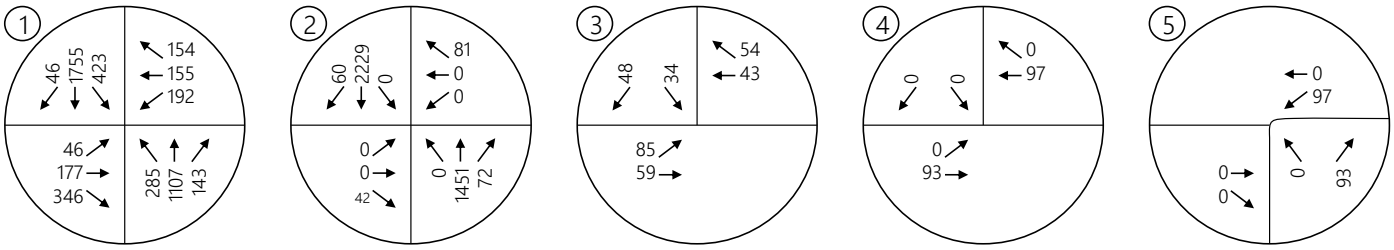
no scale



AM PEAK HOUR



PM PEAK HOUR



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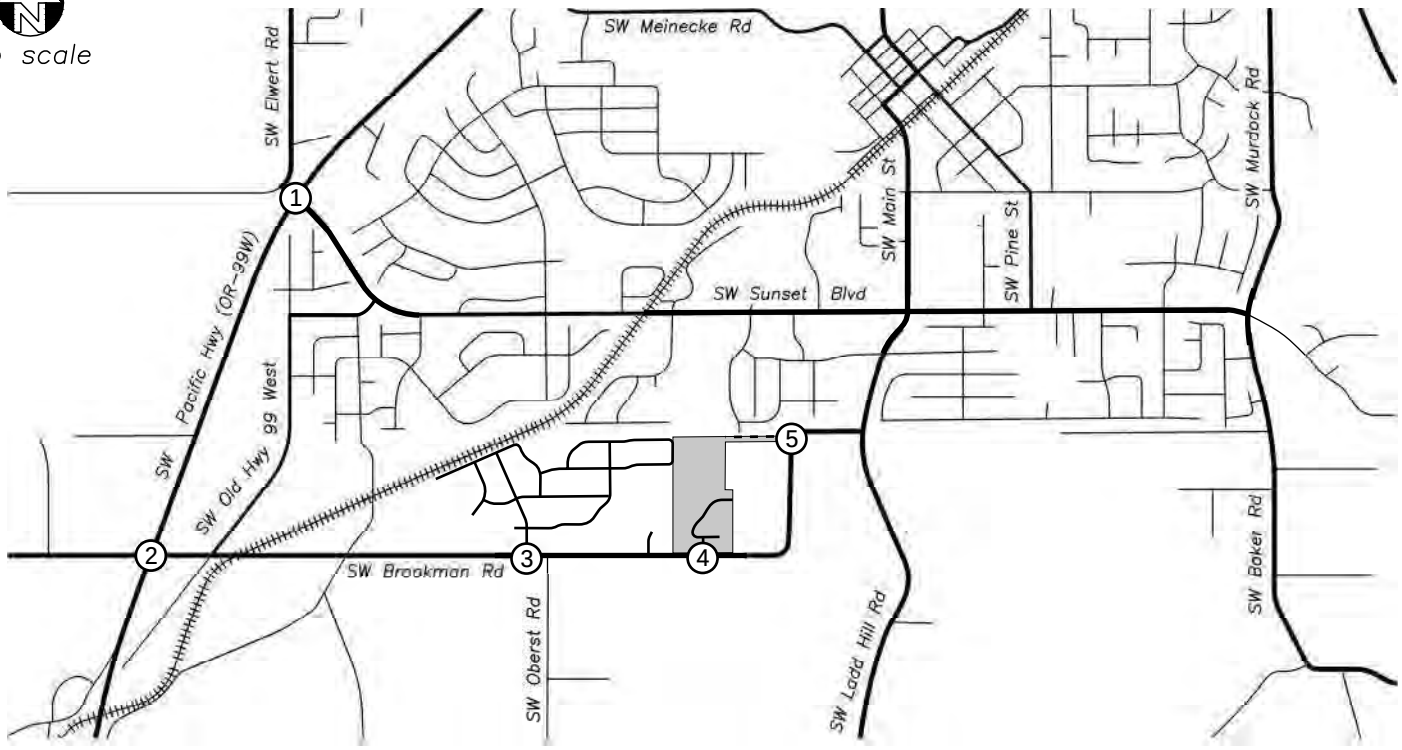
YEAR 2024 BACKGROUND CONDITIONS

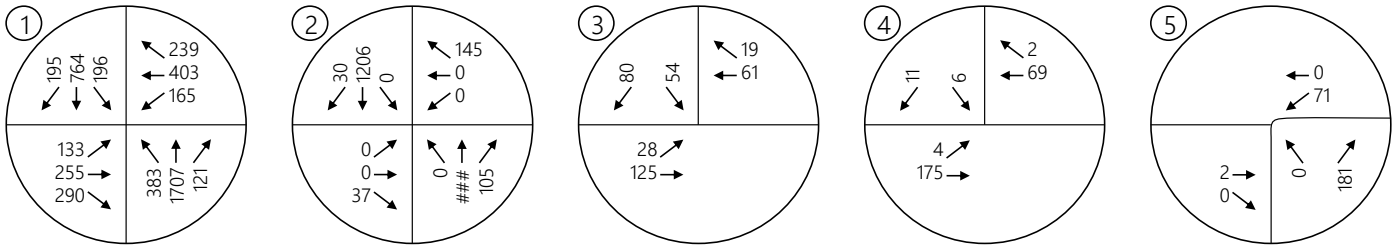
TRAFFIC VOLUMES

Figure 6
Cedar Creek Gardens
11/2/2021

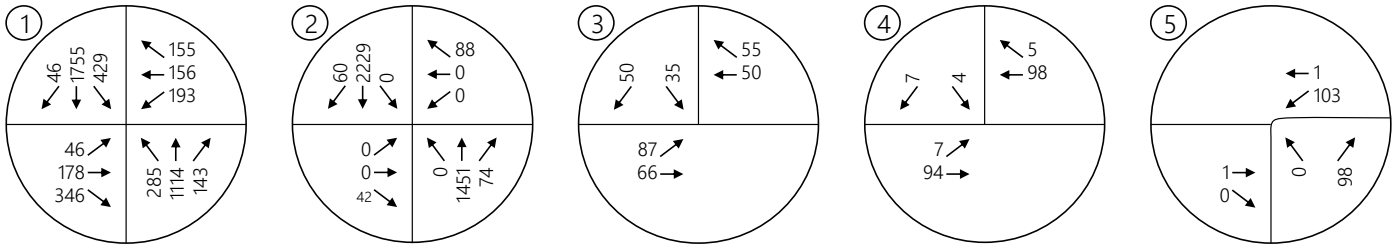
no scale



AM PEAK HOUR



PM PEAK HOUR



lancaster mobley

YEAR 2024 BUILDOUT CONDITIONS

TRAFFIC VOLUMES

Figure 7
Cedar Creek Gardens
11/2/2021

Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2014 through December 2018) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- *PDO* – Property Damage Only;
- *Injury C* – Possible Injury;
- *Injury B* – Suspected Minor Injury;
- *Injury A* – Suspected Serious Injury; and
- *Fatality*

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents approximately 10 percent of the average daily traffic (ADT) at the intersection.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections. Detailed crash data is provided in the appendix to this report.

Table 4: Crash Type Summary

Intersection		Crash Type							Total Crashes
		Turn	Rear End	Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	SW Elwert Road/ SW Sunset Boulevard at Highway 99W	9	48	3	0	1	1	0	62
2	SW Brookman Rd at Highway 99W	8	2	17	1	1	0	0	29

Table 5: Crash Severity and Rate Summary

Intersection		Severity					Total Crashes	ADT	Crash Rate	ODOT 90th %
		PDO	C	B	A	Fatal				
1	SW Elwert Road/ SW Sunset Boulevard at Highway 99W	18	33	10	1	0	62	42,650	0.797	0.860
2	SW Brookman Rd at Highway 99W	14	6	8	1	0	29	37,000	0.429	0.860

Crash Severity

Two reported crashes were classified as *Injury A*:

- One rear-end collision occurred in 2019 between vehicles traveling northbound on Highway 99W at SW Elwert Road/SW Sunset Boulevard. The driver at fault was "following too closely."
- One angle collision occurred in 2015 on Highway 99W at SW Brookman Road. The crash involved a northbound motorcycle and a westbound passenger vehicle. The vehicle driver "did not yield right-of-way" to the motorcyclist who was seriously injured as a result of the collision.

Vulnerable Travelers

One turning collision reported in 2015 involved a southbound bicyclist traveling on the highway who was struck by a westbound passenger vehicles turning left from SW Sunset Boulevard onto the highway. The bicyclist was reported to have minor injuries (Injury B).

ODOT 90th Percentile Crash Rates

The study intersections adhere to the crash analysis methodologies within ODOT's Analysis Procedures Manual (APM). According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of their respective 90th percentile crash rates should be "flagged for further analysis". Crash rates in excess of 90th percentile crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

Intersection crash rates were calculated (Table 5); none have a rate above the respective ODOT 90th percentile crash rates.

ODOT Safety Priority Index System (SPIS)

The intersection of Highway 99W at SW Elwert Rd/SW Sunset Boulevard is reported in the worst 10 percent of intersections in ODOT's 2019 SPIS listing. No improvements are currently identified in the *2021-2024 Statewide Transportation Improvement Plan* that address this intersection.

Sight Distance Evaluation

A sight distance analysis was conducted at both the main site access and the shared driveway. To evaluate the sight distance available at these locations, intersection sight distance was measured in accordance with the current AASHTO manual[2]. According to AASHTO, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye-height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

AASHTO provides a recommendation for intersection sight distance (ISD) and a requirement for stopping sight distance (SSD). Intersection sight distance is an operational measure, intended to provide sufficient line of sight along the major street so that a driver could turn from the minor street with minimal impedance of traffic flow. Stopping sight distance is considered the minimum requirement to ensure safe operation of the roadway. Stopping sight distance allows an oncoming driver to see a hazard in the roadway, react, and come to a

[2] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.

complete stop if necessary to avoid a collision. As long as the available intersection sight distance is at least equal to the minimum required stopping sight distance for the design speed of the roadway, adequate sight distance is available for safe operation of the intersection.

A field investigation was conducted on Tuesday, November 2, 2021, to measure sight distance for this location. Figure 8 displays sight distance viewpoints from the future site accesses associated with the project. Due to existing vegetation, sight lines could not be viewed from 14.5 feet from the edge of the travel way.

Main Site Access

At the main site access on SW Brookman Road, the posted speed is 35 mph, but it transitions to 25 mph just east of the access. For the sight distance assessment, the speed of approaching vehicles was assumed to be 40 mph, which is 5 mph over the posted speed. At 40 mph, the recommended ISD is 445 feet and the required ISD is 305 feet.

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 445 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

Shared Driveway Access

At the shared driveway access on SW Brookman Road, the posted speed is 25 mph. For the sight distance assessment, the speed of approaching vehicles was assumed to be 25 mph due to the curvature of the roadway. At 25 mph, the recommended ISD is 280 feet and the required ISD is 155 feet.

The images in Figure 8 and a review of the elevation profiles from Google Earth (see appendix) show that 280 feet of clear sight lines can be available if the roadside vegetation is cleared with the development. Both the ISD and SSD can be met.

A. Main Site Access Looking East

B. Main Site Access Looking West

C. Shared Driveway Looking East

D. Shared Driveway Looking South

Figure 8: Sight Line Photos at Future Site Accesses

Warrant Analysis

Left-turn lane warrants were examined for the site access intersection under year 2024 buildout conditions. A left-turn refuge is primarily a safety consideration for the major-street approach, removing left-turning vehicles from the through traffic stream.

Warrants for an eastbound left-turn lane at the site access intersection were based on the methodology outlined in the National Cooperative Highway Research Program (NCHRP) Report Number 457[3]. This methodology evaluates the need for a left-turn lane based on the number of left-turning vehicles, the number of travel lanes, the number of advancing and opposing vehicles, and the roadway travel speed.

Left-turn lane warrants are not projected to be met upon completion and occupancy of the proposed development. The detailed warrant analysis is included in the appendix.

[3] Bonneson, James A. and Michael D. Fontaine, *NCHRP Report 457: An Engineering Study Guide for Evaluating Intersection Improvements*, Transportation Research Board, 2001.

Operational Analysis

A capacity and delay analysis was conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual*[4] (HCM). Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates little, or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

The operating standards adopted by Washington County, ODOT, and the City of Sherwood are summarized below.

Washington County

SW Brookman Road is under the jurisdiction of Washington County. The County has defined operating standards for signalized and stop controlled intersections as follows:

- For signalized intersections, the maximum intersection v/c ratio shall be no greater than 0.99.
- For unsignalized intersections, no movement shall experience a v/c ratio greater than 0.99.

ODOT

ODOT operates and maintains Highway 99W. ODOT's operating mobility target for intersections along Highway 99W in the study area is an intersection v/c ratio no greater than 0.99 during the 1st and 2nd peak hours per Table 7 of the *Oregon Highway Plan*[5].

City of Sherwood

According to the City of Sherwood's Transportation System Plan (TSP), both signalized and unsignalized intersections under City jurisdiction must operate at LOS D or better with a v/c ratio of 0.85 or less; however, two-way stop-controlled intersections are required to operate at LOS E or better with a v/c ratio of 0.90 or less[6].

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6 for the morning and evening peak hours. Detailed calculations are included in the appendix.

[4] Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.
[5] Oregon Department of Transportation, *Oregon Highway Plan*. 1999
[6] City of Sherwood, *Sherwood Transportation System Plan*. Adopted June 17th, 2014.

Table 6: Capacity Analysis Summary

Intersection & Condition	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SW Elwert Road/SW Sunset Boulevard at Highway 99W						
2021 Existing Conditions	C	25	0.78	C	34	0.86
2024 Background Conditions	D	40	0.94	D	46	0.95
2024 Buildout Conditions	D	41	0.95	D	46	0.95
2. SW Brookman Road at Highway 99W						
2021 Existing Conditions	F	60	0.37	F	212	0.83
2024 Background Conditions	F	63	0.73	D	30	0.23
2024 Buildout Conditions	F	70	0.79	D	30	0.23
3. SW Brookman Road at Middlebrook Site Access						
2024 Background Conditions	B	11	0.24	B	11	0.17
2024 Buildout Conditions	B	11	0.25	B	11	0.18
4. SW Brookman Road at Main Sitrie Access						
2024 Buildout Conditions	A	10	0.03	A	10	0.02
5. SW Brookman Road at North Site Access						
2024 Buildout Conditions	B	11	0.01	B	10	0.01

BOLDED results indicate operation above acceptable jurisdictional standards.

As shown, all study intersections are projected to operate within agency standards under all analysis scenarios for all conditions. These results differ slightly from the conclusions in previous studies for the following reasons:

- At the intersection of SW Elwert Road/SW Sunset Boulevard at Highway 99W, the analysis outputs indicate that the eastbound shared through-right lane acts as a de facto right-turn lane and recommends recoding the lane to reflect the condition. When the approach is recoded to show a single through lane and a right-turn lane, operations improve measurably because the right-turn factor is only applied to one lane rather than two lanes.
- According to the APM software settings for signalized intersection analysis, "ODOT default for lost time is 4.0 seconds." Therefore, all lost times were adjusted appropriately following the procedures in the APM.

Based on the above analysis and findings, all study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.

As shown in Figure 7, the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both the morning and evening peak hours. Restriping the eastbound approach to provide a through and a right-turn lane could improve flow at the intersection because it would eliminate

occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping.

Proportionate Share Mitigation Assessment

Consistent with *The Reserve TIA*, proportionate share fees were calculated at intersections determined as failing, using methodologies similar to those presented in Table 6 of the referenced TIA. Table 7 provides the methodology used to calculate proportionate share fees based on the Cedar Creek Gardens trip assignment.

Table 7: Proportionate Share Methodolgy Summary

Intersection	A. SW Sunset Boulevard at SW Woodehaven Drive	B. SW Sunset Boulevard at SW Timbrel Lane	C. SW Sunset Boulevard at SW Main Street/SW Ladd Hill Road	D. SW Sunset`` Boulevard at SW Murdock Road/SW Baker Road
Mitigation Project Summary	Construct Traffic Signal	Construct Mini Roundabout	Construct Traffic Signal	Construct NB LTL & SB RTL
City TSP Project ID	NA	D28	D26	D33
Peak Hour	Weekday AM	Weekday AM	Weekday PM	Weekday PM
Scenario Triggering Mitigation	No Build (2024)	No Build (2024)	No Build (2024)	No Build (2024)
Existing Total Entering Volume, TEV (X)	1,012	894	1,208	1,208
2024 No Build (Background with RIRO, Y)	1,541	1,318	1,487	1,371
2024 Project Trips (PT)	10	10	10	6
Background Growth (Z=Y-X)	529	424	279	163
Proportional Share (%, PT/(PT+Z))	1.86%	2.30%	3.46%	3.55%
Mitigation Cost Estimate ($)	$1,050,000	$630,000	$250,000	$750,000
Cost Estimate Reference	DKS (Ref 10)	DKS (Ref 10)	TSP (Ref 5)	TSP (Ref 5)
Proportional Share Cost	$19,480.52	$14,516.13	$8,650.52	$26,627.22
Total	$69,274.39			

Based on the proportionate share fee calculations, a total proportionate share fee to mitigate site trip impacts to the above intersections is $69,274.39.

Conclusions

Key findings of this study include:

- No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
- A review of existing sight lines and elevation profiles from Google Earth show that adequate sight distance can be available if the roadside vegetation is cleared with the development. Both the intersection sight distance and stopping sight distance can be met at the main site access and the shared driveway.
- Left-turn lane warrants are not projected to be met at the site access intersection along SW Brookman Road upon completion and occupancy of the proposed development. Accordingly, installation of a left-turn lane at the site access intersection is not necessary or recommended.
- All study intersections are projected to operate acceptably per their respectively jurisdictional standards by year 2024 with buildout of the proposed subdivision. Accordingly, no operational mitigation is necessary as part of the proposed Cedar Creek Subdivision.
- Because the eastbound right-turn volumes on SW Elwert Road at Highway 99W are greater than the through volumes during both peak hours under all scenarios, agencies may wish to consider restriping the eastbound approach to provide a through and a right-turn lane. This change would eliminate occasional through vehicles in the right lane blocking other vehicles from executing a right-turn-on-red movement. A right-turn overlap phase could also be considered with the restriping. The change is not necessary to accommodate the proposed development.
- *The Reserve at Cedar Creek Transportation Impact Analysis* (TIA) – *Sherwood, Oregon*, dated September 19th, 2019, identified four intersections as currently exceeding acceptable jurisdictional standards. Based on the projected site trip impacts to these intersections, a total proportionate share fee to mitigate impacts of $69,274.39 was calculated.

Appendix

- Site Plan
- Trip Generation
- Traffic Counts
- Reference Study Volumes
- In Process Trips
- Crash Data
- Sight Lines and Elevation Profiles
- Warrant Calculations
- Level of Service Definitions
- Operational Outputs

Exhibit A27

MATCHLINE - SEE THIS SHEET

"ARBOR LANE"

12.00' SHARED ACCESS EASEMENT FOR LOTS 40-42

EXISTING TRAIL

COMMUNITY TRAIL

100 YR FP

VC BOUNDARY

WETLAND BOUNDARY

40 6062 SF

41 10421 SF

42 10522 SF

SHARED DRIVEWAY

TRACT H OPEN SPACE 10660 SF

SW BROOKMAN ROAD

WETLAND BOUNDARY

VC BOUNDARY

20.00' VACTOR TRUCK TURN AROUND EASEMENT

37 5017 SF

38 4884 SF

36 4656 SF

39 11033 SF

TRACT D OPEN SPACE 79478 SF

TRACT B OPEN SPACE

TRACT C STORM FACILITY 11167 SF

27 4577 SF

28 4969 SF

29 4950 SF

30 4950 SF

25 4500 SF

24 4945 SF

26 4917 SF

35 5146 SF

34 5506 SF

33 7261 SF

9 6209 SF

10 5309 SF

11 5084 SF

12 5098 SF

13 5374 SF

14 5222 SF

15 5137 SF

32 5584 SF

31 5454 SF

STREET 'B'

STREET 'A'

TRACT E

TRACT F

TRACT G PRIVATE

23 4945 SF

22 5176 SF

21 5319 SF

20 5130 SF

19 5447 SF

16 5656 SF

17 5436 SF

18 5725 SF

ACCESSWAY

35' EASEMENT

15.00' PEDESTRIAN AND BICYCLE ACCESS EASEMENT

TRACT B OPEN SPACE

TRACT 'A'

TRACT B OPEN SPACE 430014 SF

20.00' TRAIL EASEMENT

3 7276 SF

2 5659 SF

1 4944 SF

4 6010 SF

5 5123 SF

6 5063 SF

7 5023 SF

8 5015 SF

TRACT A STORM FACILITY 7320 SF

SW YAMEL TERRACE

SCALE 60 0 30 60

1 INCH = 60 FEET

PIONEER DESIGN GROUP

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PRELIMINARY PLAT

CEDAR CREEK GARDENS

CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P3.0plat.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS

No.
285-021

Type
PLANNING

Sheet
P3.0

B:\Projects\285-021-19\Planning\28521_P3.0plat.dwg 10/20/2021 12:27:11 PM

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 42

AM PEAK HOUR

Trip Equation: Ln(T)=0.91Ln(X)+0.120

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	9	25	34

PM PEAK HOUR

Trip Equation: Ln(T)=0.94Ln(X)+0.27

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	28	16	44

WEEKDAY

Trip Equation: Ln(T)=0.92Ln(X)+2.68

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	227	227	454

SATURDAY

Trip Equation: Ln(T)=0.97Ln(X)+2.4

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	207	207	414

Source: Trip Generation Manual, 11th Edition

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 2

AM PEAK HOUR

Trip Equation: Ln(T)=0.91Ln(X)+0.120

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	1	1	2

PM PEAK HOUR

Trip Equation: Ln(T)=0.94Ln(X)+0.27

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	2	1	3

WEEKDAY

Trip Equation: Ln(T)=0.92Ln(X)+2.68

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	14	14	28

SATURDAY

Trip Equation: Ln(T)=0.97Ln(X)+2.4

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	11	11	22

Source: Trip Generation Manual, 11th Edition

Type of peak hour being reported: Intersection Peak

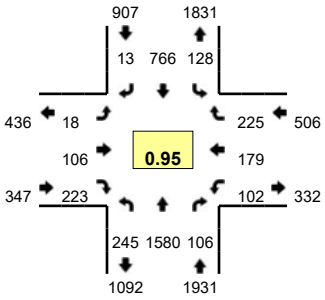
Method for determining peak hour: Total Entering Volume

LOCATION: SW Pacific Hwy -- SW Elwert Rd/SW Sunset Blvd

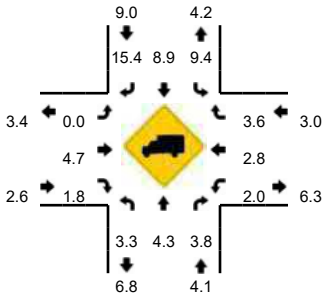
QC JOB #: 14401717

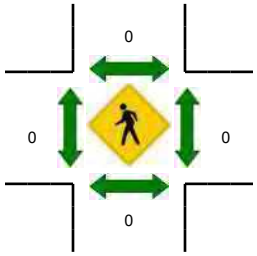
CITY/STATE: Sherwood, OR

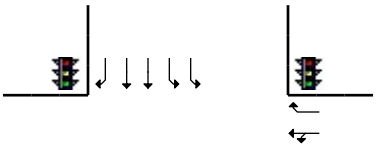
DATE: Thu, May 11 2017

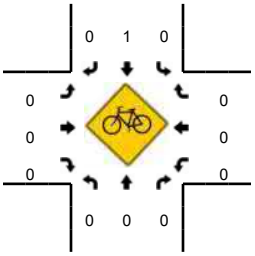


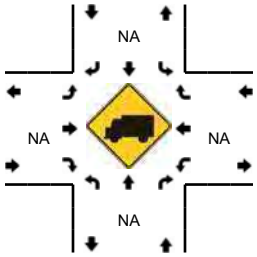
Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

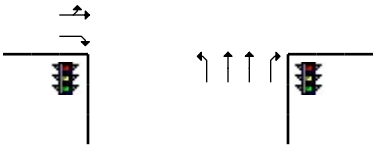


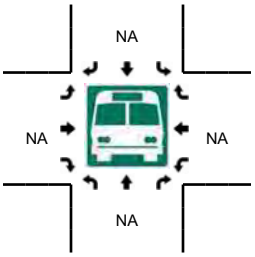












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Elwert Rd/SW Sunset Blvd (Eastbound)				SW Elwert Rd/SW Sunset Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	22	126	6	0	2	43	0	1	0	5	15	0	11	13	12	0	256	
7:05 AM	10	136	9	0	3	71	2	0	3	5	19	0	8	8	17	0	291	
7:10 AM	20	118	8	0	8	54	1	1	1	7	25	0	14	19	12	0	288	
7:15 AM	34	127	9	0	6	44	1	1	1	9	17	0	9	15	19	0	292	
7:20 AM	23	140	8	0	5	60	0	0	3	5	16	0	16	8	16	0	300	
7:25 AM	22	154	14	0	7	76	1	0	0	5	14	0	3	15	16	0	327	
7:30 AM	19	119	7	0	11	50	1	1	4	14	20	0	4	21	17	0	288	
7:35 AM	22	123	5	0	12	52	1	1	1	9	14	0	13	25	16	0	294	
7:40 AM	20	139	9	0	13	64	0	1	1	9	14	0	7	19	19	0	315	
7:45 AM	23	122	7	0	20	69	2	2	2	9	21	0	7	15	23	0	322	
7:50 AM	14	121	8	0	11	100	2	0	0	13	24	0	8	14	23	0	338	
7:55 AM	26	115	10	0	17	59	1	1	2	10	20	0	7	11	29	0	308	3619
8:00 AM	11	166	12	1	7	67	1	0	0	11	19	0	6	9	18	0	328	3691
8:05 AM	8	79	9	0	8	63	0	1	1	5	26	0	10	5	15	0	230	3630
8:10 AM	16	81	4	0	6	48	0	3	2	2	11	0	7	14	12	0	206	3548
8:15 AM	12	133	6	0	6	83	0	1	1	4	12	0	5	7	12	0	282	3538
8:20 AM	23	98	8	0	6	40	0	4	0	6	16	0	7	8	7	0	223	3461
8:25 AM	11	110	9	0	6	55	0	2	2	2	19	0	7	8	9	0	240	3374
8:30 AM	16	76	5	0	13	51	0	3	0	3	10	0	7	6	14	0	204	3290
8:35 AM	17	128	7	0	7	66	2	1	1	8	13	0	5	9	11	0	275	3271
8:40 AM	9	112	11	0	9	62	1	1	1	3	10	0	3	4	3	0	229	3185
8:45 AM	8	93	8	0	7	60	0	0	1	4	10	0	11	8	17	0	227	3090
8:50 AM	9	96	11	0	3	59	0	1	1	7	23	0	7	6	12	0	235	2987
8:55 AM	9	86	6	0	8	74	1	3	1	8	8	0	5	3	11	0	223	2902

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	228	1528	96	0	176	932	16	12	12	124	236	0	88	192	260	0	3900
Heavy Trucks	12	68	4		12	60	4		0	4	0		0	4	16		184
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

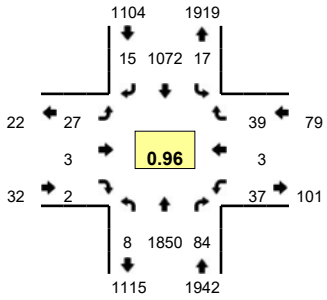
Type of peak hour being reported: Intersection Peak

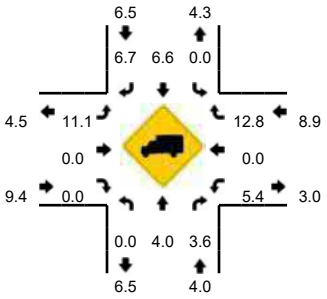
Method for determining peak hour: Total Entering Volume

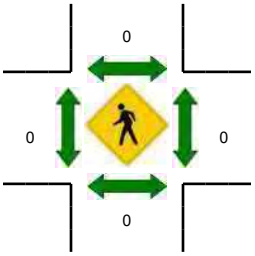
LOCATION: SW Pacific Hwy -- SW Chapman Rd
CITY/STATE: Sherwood, OR

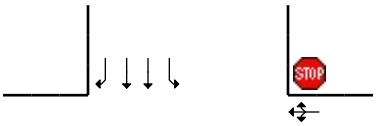
QC JOB #: 14401706
DATE: Thu, May 11 2017

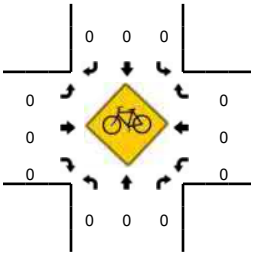
Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

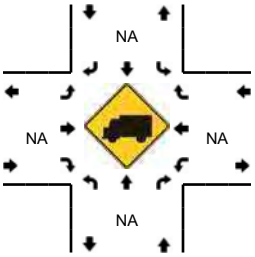


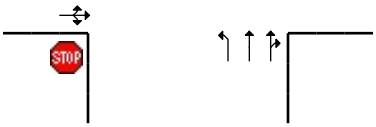


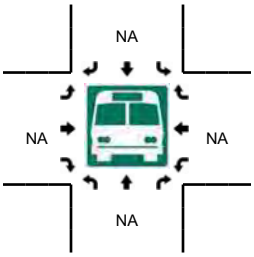












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Chapman Rd (Eastbound)				SW Chapman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	133	2	0	0	74	0	0	1	0	0	0	4	0	3	0	217	
7:05 AM	0	169	5	1	0	81	4	0	0	0	0	0	2	0	0	0	262	
7:10 AM	0	159	6	0	0	99	1	1	1	0	0	0	1	0	1	0	269	
7:15 AM	1	165	11	0	1	75	0	0	0	1	0	0	2	0	2	0	258	
7:20 AM	0	174	7	0	0	100	0	1	1	1	0	0	3	0	1	0	288	
7:25 AM	0	141	8	1	1	78	1	0	3	0	0	0	4	0	2	0	239	
7:30 AM	0	177	8	0	1	84	0	0	4	0	1	0	0	1	4	0	280	
7:35 AM	0	177	8	0	0	85	1	0	0	0	0	0	4	0	3	0	278	
7:40 AM	1	147	14	1	1	85	1	0	4	0	0	0	3	1	5	0	263	
7:45 AM	1	142	9	0	4	99	2	0	3	0	0	0	2	0	4	0	266	
7:50 AM	0	147	6	0	1	125	1	1	2	0	0	0	4	1	3	0	291	
7:55 AM	1	133	1	0	3	82	2	0	1	1	1	0	8	0	6	0	239	3150
8:00 AM	0	119	1	1	2	79	2	0	8	0	0	0	4	0	8	0	224	3157
8:05 AM	0	98	4	0	2	85	4	0	5	0	0	0	2	1	1	0	202	3097
8:10 AM	0	127	2	0	1	82	1	0	0	1	0	0	3	0	1	0	218	3046
8:15 AM	0	130	3	0	2	72	2	0	3	0	1	0	2	0	2	0	217	3005
8:20 AM	1	135	6	0	1	89	1	1	0	1	0	0	3	0	2	0	240	2957
8:25 AM	0	115	5	0	3	63	0	0	0	0	0	0	0	0	1	0	187	2905
8:30 AM	0	127	3	0	1	71	0	0	1	0	0	0	3	1	3	0	210	2835
8:35 AM	0	118	3	0	1	83	2	0	2	0	0	0	0	1	1	0	211	2768
8:40 AM	1	143	0	1	1	68	2	1	1	0	0	0	3	0	0	0	221	2726
8:45 AM	0	108	1	0	1	87	4	1	0	1	0	0	3	0	2	0	208	2668
8:50 AM	1	127	3	0	0	88	1	0	0	1	1	0	1	0	1	0	224	2601
8:55 AM	0	93	4	0	1	89	3	0	2	1	1	0	3	1	1	0	199	2561

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	2004	120	4	8	1016	8	0	32	0	4	0	28	8	48	0	3284
Heavy Trucks	0	64	4		0	100	0		0	0	0		4	0	4		176
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM

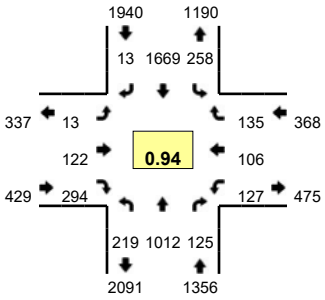
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

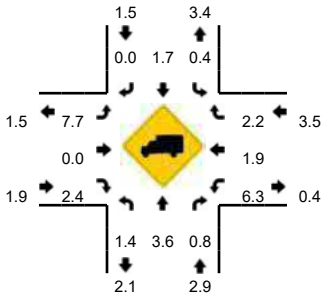
Method for determining peak hour: Total Entering Volume

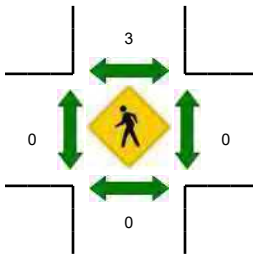
LOCATION: SW Pacific Hwy -- SW Elwert Rd/SW Sunset Blvd
CITY/STATE: Sherwood, OR

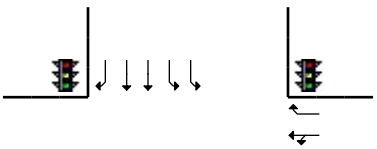
QC JOB #: 14401718
DATE: Thu, May 11 2017

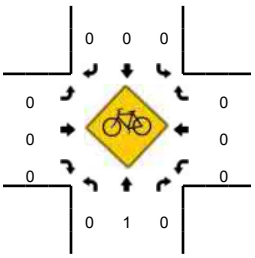


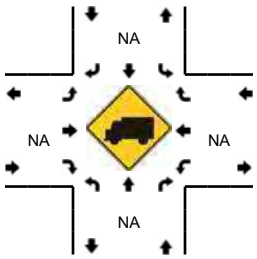
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

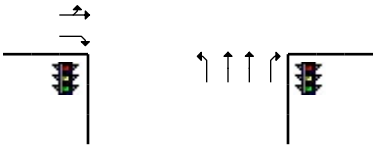


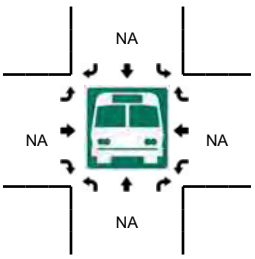












5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Elwert Rd/SW Sunset Blvd (Eastbound)				SW Elwert Rd/SW Sunset Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	15	71	6	1	11	141	3	4	3	11	27	0	10	6	6	0	315	
4:05 PM	4	62	14	0	14	154	0	1	0	12	26	0	7	5	11	0	310	
4:10 PM	12	76	3	0	11	132	0	2	0	10	27	0	9	8	10	0	300	
4:15 PM	13	96	13	1	10	111	3	3	1	7	25	0	11	8	15	0	317	
4:20 PM	16	91	13	1	13	149	0	5	0	12	18	0	13	7	11	0	349	
4:25 PM	13	82	5	0	12	140	2	3	1	9	21	0	12	10	16	0	326	
4:30 PM	22	73	10	0	12	110	3	2	0	11	28	0	6	7	11	0	295	
4:35 PM	16	82	8	0	19	121	2	6	0	11	26	0	10	8	11	0	320	
4:40 PM	24	100	17	1	13	129	1	2	0	7	29	0	12	8	9	0	352	
4:45 PM	23	79	9	0	19	136	0	3	1	7	22	0	11	19	15	0	344	
4:50 PM	22	87	11	0	22	124	1	3	2	12	27	0	11	10	12	0	344	
4:55 PM	14	78	16	0	25	136	1	1	2	6	28	0	12	8	18	0	345	3917
5:00 PM	19	77	8	0	10	117	0	5	2	11	29	0	9	11	10	0	308	3910
5:05 PM	13	63	8	0	16	153	2	2	0	12	22	0	17	6	16	0	330	3930
5:10 PM	16	80	9	0	22	158	0	0	1	13	23	0	13	4	10	0	349	3979
5:15 PM	15	95	17	0	14	157	2	2	5	7	22	0	11	10	8	0	365	4027
5:20 PM	14	108	4	0	25	154	1	4	0	12	22	0	12	9	12	0	377	4055
5:25 PM	22	75	7	0	16	142	1	5	0	13	24	0	6	8	7	0	326	4055
5:30 PM	21	93	11	0	25	110	2	1	0	9	27	0	7	6	11	0	323	4083
5:35 PM	15	77	8	0	21	153	2	2	0	13	19	0	6	7	7	0	330	4093
5:40 PM	17	89	9	0	21	131	0	7	0	10	25	0	4	8	8	0	329	4070
5:45 PM	17	88	13	0	8	136	3	1	1	5	26	0	7	8	11	0	324	4050
5:50 PM	19	87	15	0	22	134	0	3	1	11	25	0	10	5	11	0	343	4049
5:55 PM	17	64	8	0	31	134	4	2	0	12	15	0	11	6	11	0	315	4019

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	180	1132	120	0	244	1876	12	24	24	128	268	0	144	92	120	0	4364
Heavy Trucks	8	40	4		0	20	0		4	0	8		8	0	0		92
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/19/2017 4:01 PM

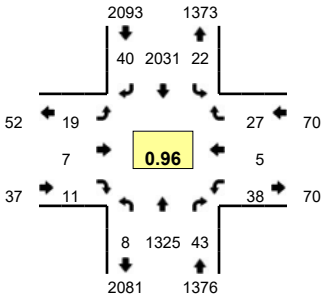
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

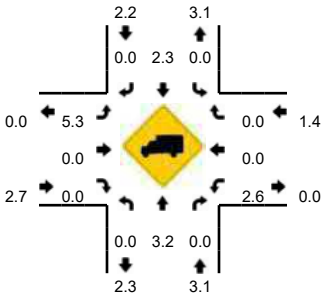
Method for determining peak hour: Total Entering Volume

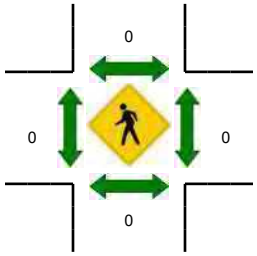
LOCATION: SW Pacific Hwy -- SW Chapman Rd
CITY/STATE: Sherwood, OR

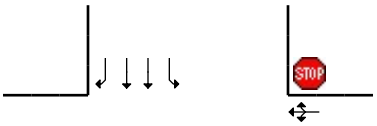
QC JOB #: 14401707
DATE: Thu, May 11 2017

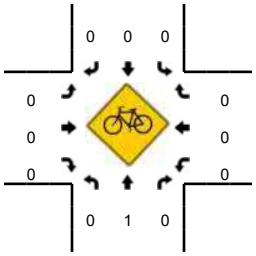


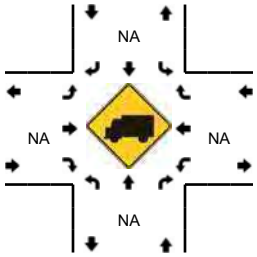
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

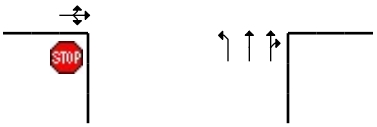


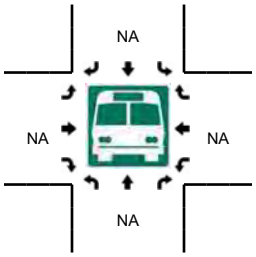












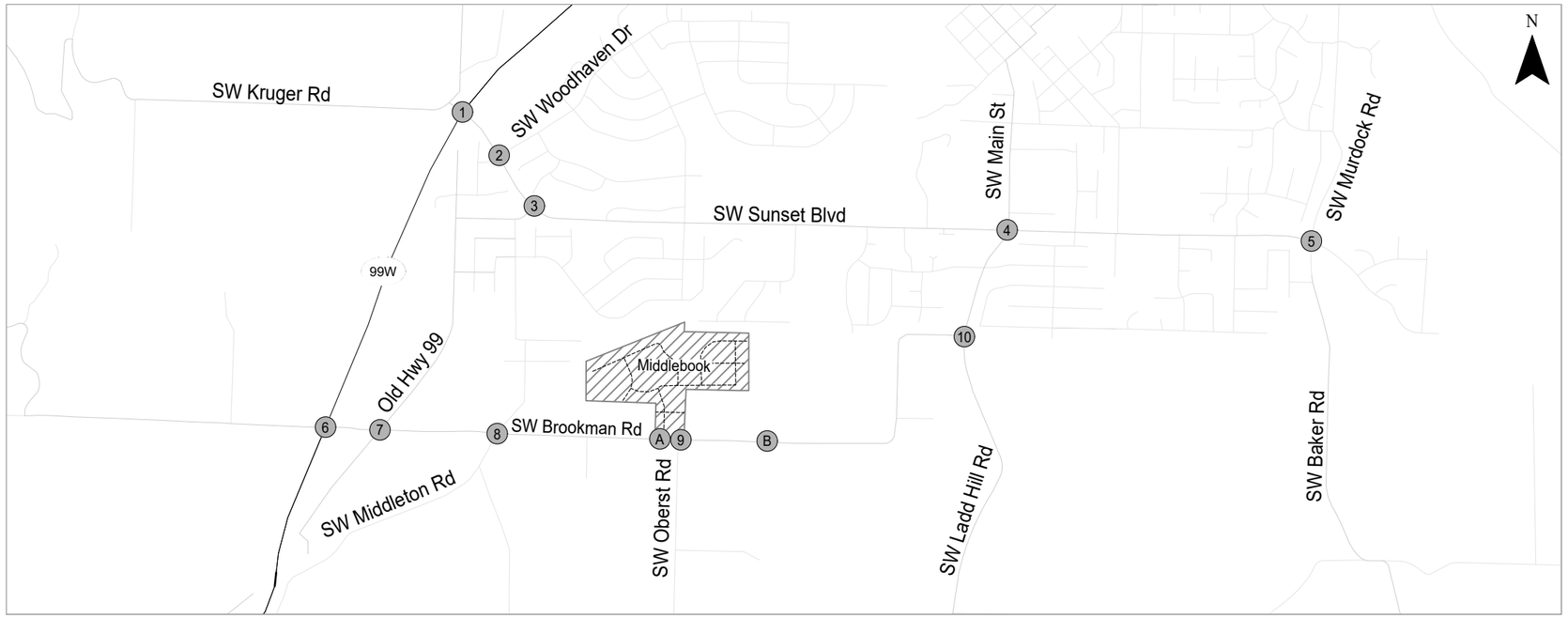
5-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Chapman Rd (Eastbound)				SW Chapman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	89	1	0	1	184	2	0	1	1	0	0	2	0	0	0	281	
4:05 PM	0	72	6	1	0	166	3	0	0	0	1	0	5	0	0	0	254	
4:10 PM	1	103	2	1	1	160	1	0	1	0	1	0	3	0	1	0	275	
4:15 PM	0	126	4	0	1	163	4	0	4	0	0	0	4	0	2	0	308	
4:20 PM	0	124	1	0	1	153	1	0	1	0	0	0	4	0	0	0	285	
4:25 PM	1	92	5	0	1	172	4	0	1	0	0	0	4	0	2	0	282	
4:30 PM	1	102	2	0	3	149	0	0	0	0	0	0	4	0	2	0	263	
4:35 PM	2	114	0	0	1	153	3	0	2	2	0	0	1	0	4	0	282	
4:40 PM	0	117	2	0	3	149	4	0	5	1	3	0	6	0	4	0	294	
4:45 PM	0	108	2	0	0	176	3	0	3	1	1	0	3	0	5	0	302	
4:50 PM	0	117	5	0	2	177	4	0	0	1	1	0	4	1	1	0	313	
4:55 PM	2	121	3	0	1	173	5	0	0	0	1	0	1	0	3	0	310	3449
5:00 PM	0	102	6	0	4	159	1	1	0	0	2	0	3	0	1	0	279	3447
5:05 PM	0	91	2	0	2	183	3	0	1	0	1	0	0	1	0	0	284	3477
5:10 PM	0	110	6	0	4	187	2	1	4	0	0	0	5	0	1	0	320	3522
5:15 PM	2	119	3	0	1	189	5	0	0	1	1	0	2	1	1	0	325	3539
5:20 PM	1	107	1	1	0	161	3	0	2	0	0	0	6	0	5	0	287	3541
5:25 PM	0	114	6	0	2	177	5	0	1	0	1	0	4	0	0	0	310	3569
5:30 PM	0	105	7	0	0	147	2	0	1	1	0	0	3	2	2	0	270	3576
5:35 PM	0	100	0	0	1	164	2	1	1	0	1	0	4	1	2	0	277	3571
5:40 PM	0	132	4	0	0	156	2	0	1	0	1	0	0	0	1	0	297	3574
5:45 PM	0	114	4	0	0	149	1	0	4	0	0	0	5	0	2	0	279	3551
5:50 PM	0	93	3	0	3	158	1	0	0	4	0	0	5	1	1	0	269	3507
5:55 PM	0	82	3	0	2	151	0	0	1	2	0	0	5	0	1	0	247	3444

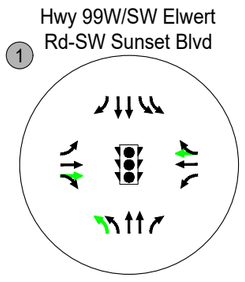
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	1344	40	4	20	2148	40	4	24	4	4	0	52	4	28	0	3728
Heavy Trucks	0	44	0		0	40	0		0	0	0		0	0	0		84
Pedestrians		0				0				0				0			0
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

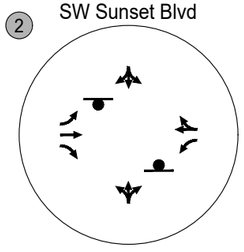
Comments:

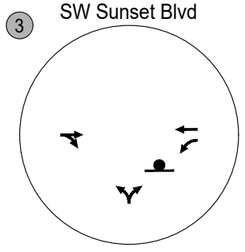
Report generated on 5/19/2017 4:01 PM

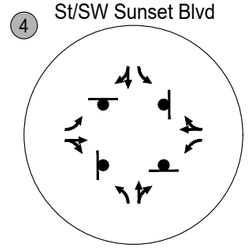
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

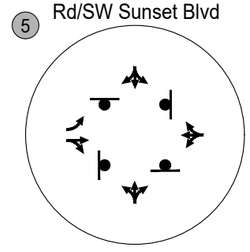


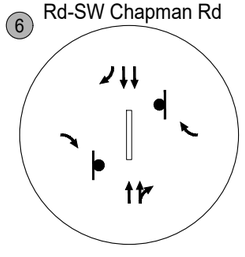


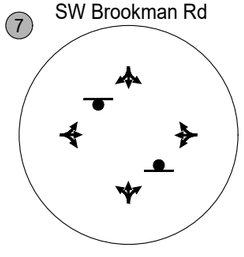


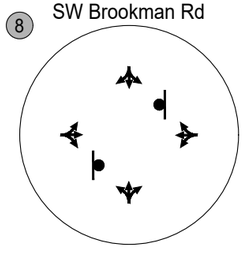


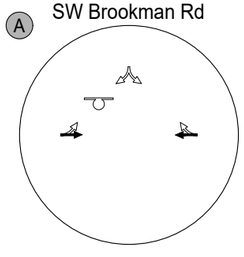


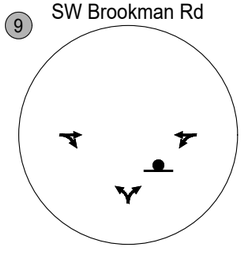


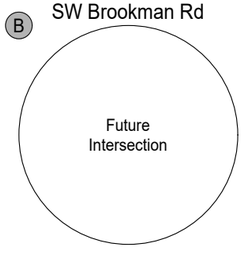


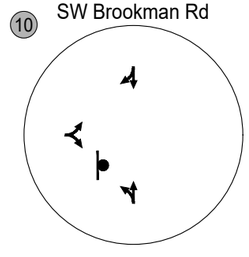








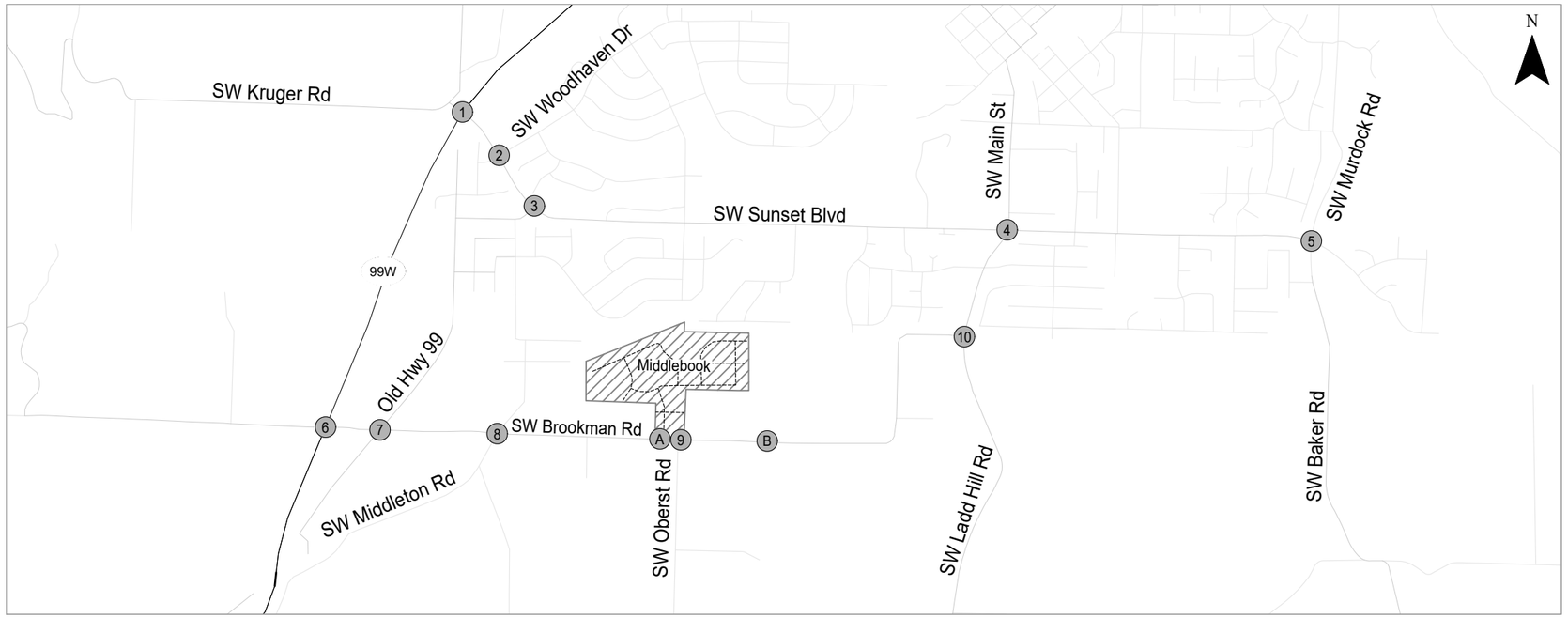




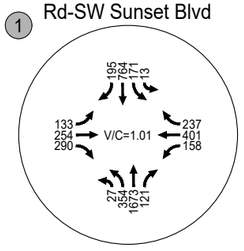
- STOP SIGN
- TRAFFIC SIGNAL
- RAISED MEDIAN
- EXISTING
- PLANNED IMPROVEMENT
- MOVEMENT/IMPROVEMENT ADDED WITH MIDDLEBROOK DEVELOPMENT

Year 2024 Background Assumed Lane Configurations and Traffic Control Devices
Sherwood, Oregon

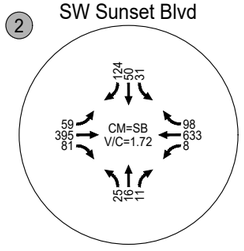
Figure 6



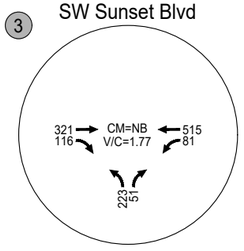
Hwy 99W/SW Elwert Rd-SW Sunset Blvd



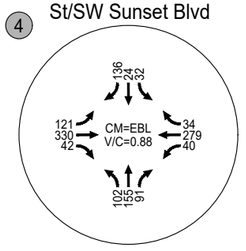
SW Woodhaven Dr/ SW Sunset Blvd



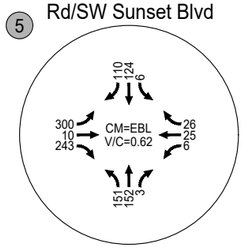
SW Timbrel Ln/ SW Sunset Blvd



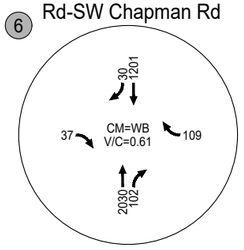
SW Ladd Hill Rd-SW Main St/SW Sunset Blvd



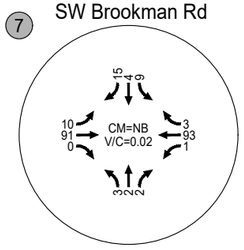
SW Baker Rd-SW Murdock Rd/SW Sunset Blvd



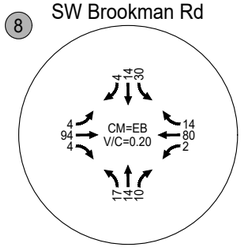
Hwy 99W/SW Brookman Rd-SW Chapman Rd



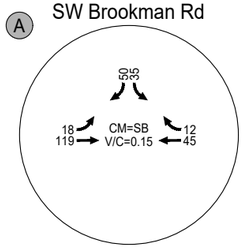
Old Hwy 99W/ SW Brookman Rd



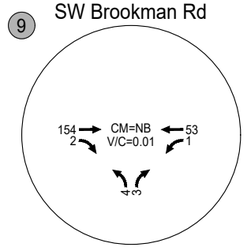
SW Middleton Rd/ SW Brookman Rd



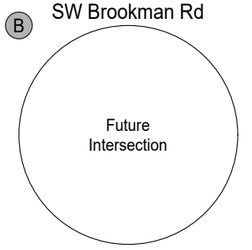
Middlebrook Access/ SW Brookman Rd



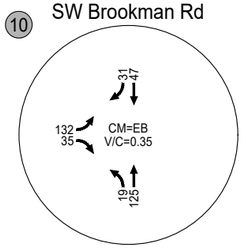
SW Oberst Rd/ SW Brookman Rd



The Reserve Access/ SW Brookman Rd



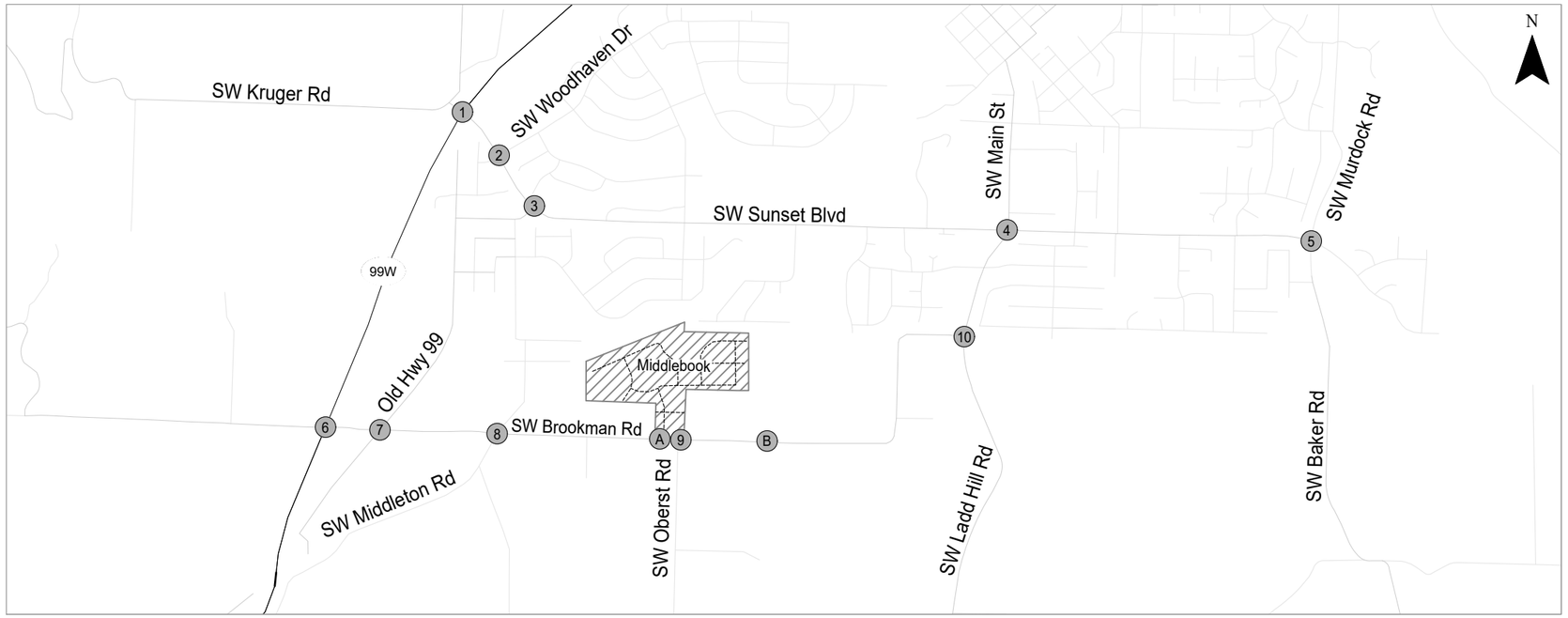
SW Ladd Hill Rd/ SW Brookman Rd



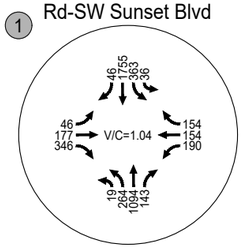
CM = CRITICAL MOVEMENT (TWSC)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
TWSC = TWO-WAY STOP CONTROL
AWSC= ALL-WAY STOP CONTROL

Year 2024 Background Intersection Operations Weekday AM Peak Hour Sherwood, Oregon

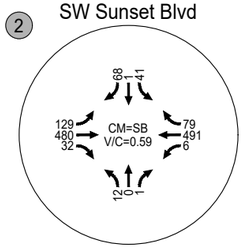
Figure 7



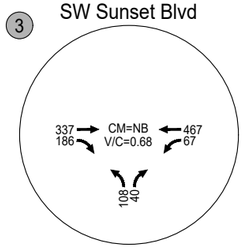
Hwy 99W/SW Elwert Rd-SW Sunset Blvd



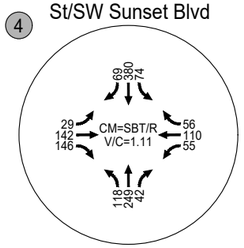
SW Woodhaven Dr/ SW Sunset Blvd



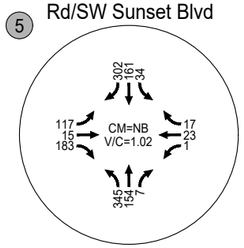
SW Timbrel Ln/ SW Sunset Blvd



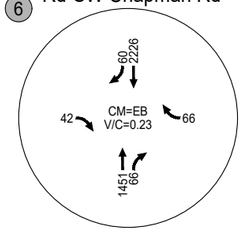
SW Ladd Hill Rd-SW Main St/SW Sunset Blvd



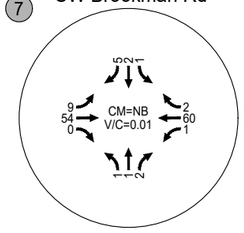
SW Baker Rd-SW Murdock Rd/SW Sunset Blvd



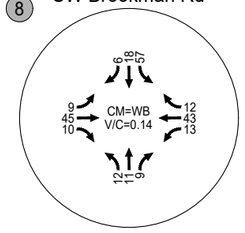
Hwy 99W/SW Brookman Rd-SW Chapman Rd



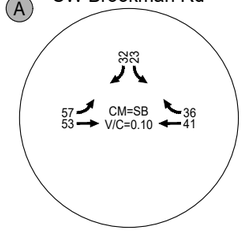
Old Hwy 99W/ SW Brookman Rd



SW Middleton Rd/ SW Brookman Rd



Middlebrook Access/ SW Brookman Rd



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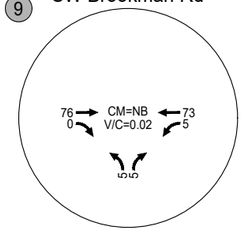
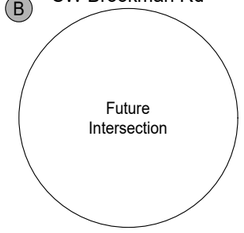
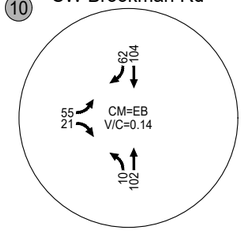


The Reserve Access/ SW Brookman Rd



SW Ladd Hill Rd/ SW Brookman Rd



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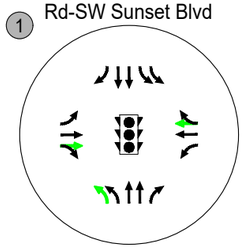
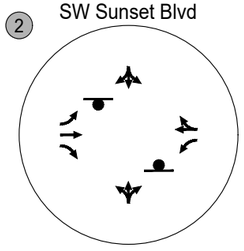
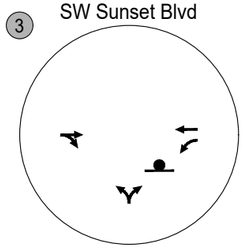
Year 2024 Background Intersection Operations
Weekday PM Peak Hour
Sherwood, Oregon

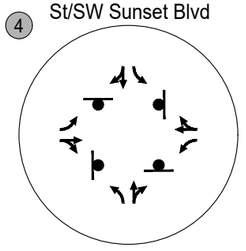
Figure 8

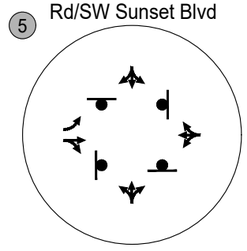
KITTELSON & ASSOCIATES

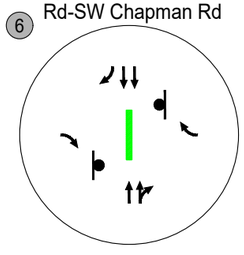


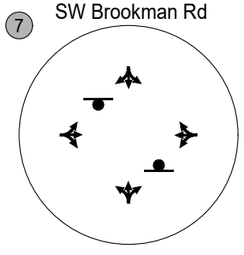


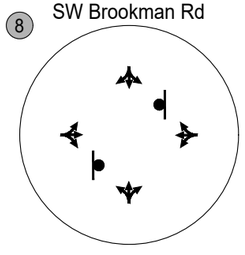


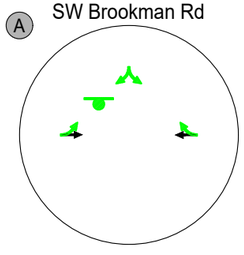


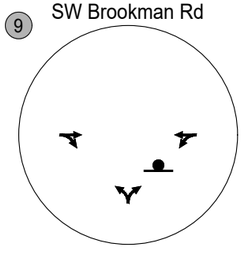


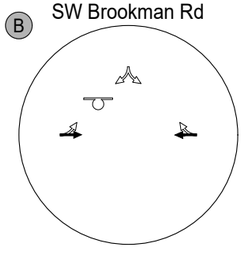


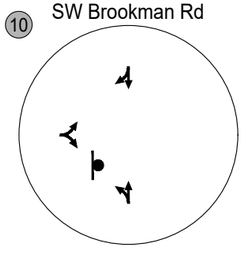








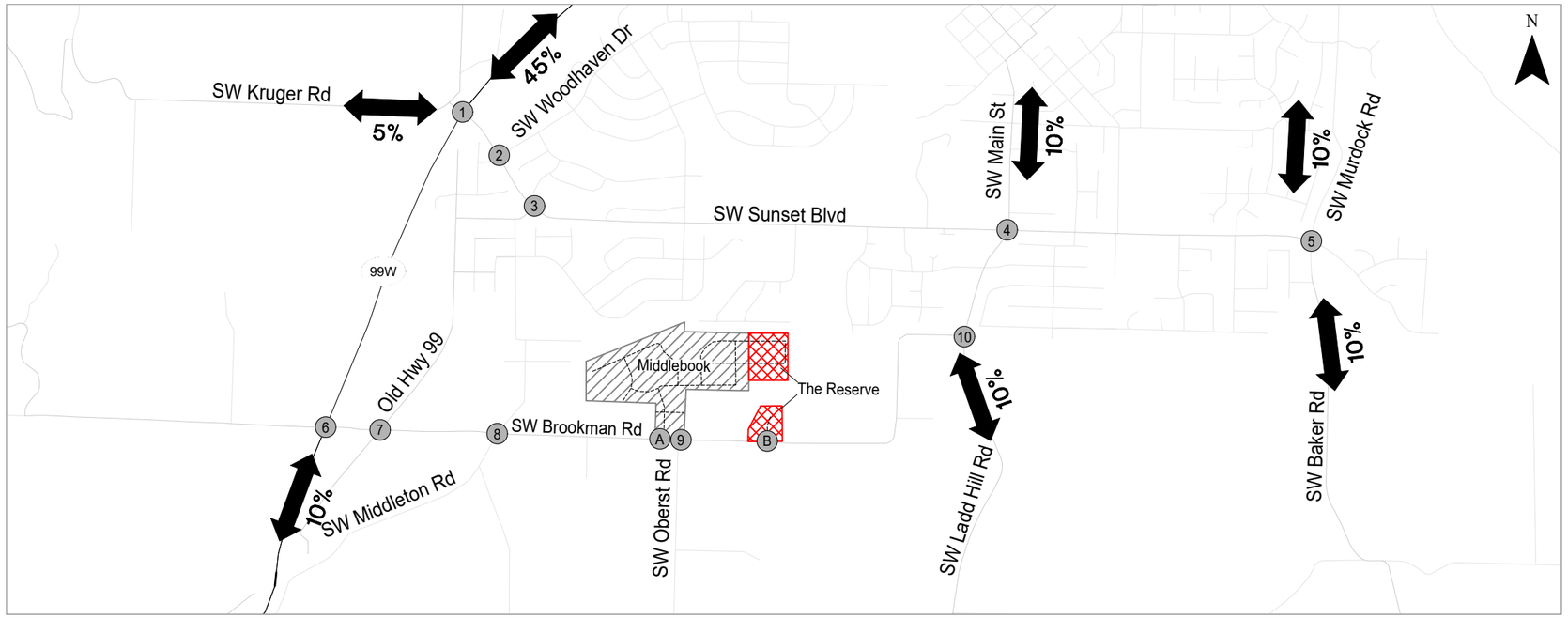


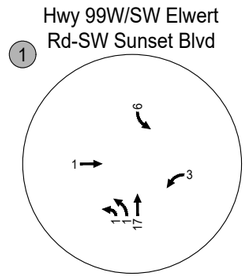


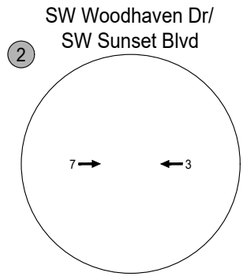
- STOP SIGN
- TRAFFIC SIGNAL
- RAISED MEDIAN
- EXISTING
- PLANNED IMPROVEMENT
- MOVEMENT ADDED WITH THE RESERVE DEVELOPMENT

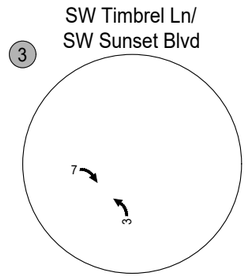
Year 2024 Background Assumed Lane Configurations and Traffic Control Devices
Sherwood, Oregon

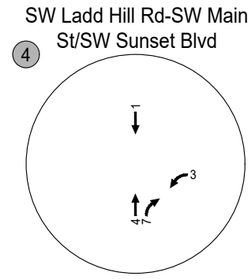
Figure 9

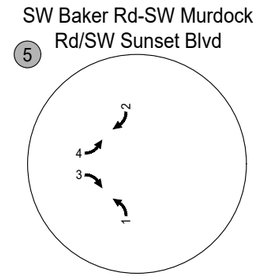


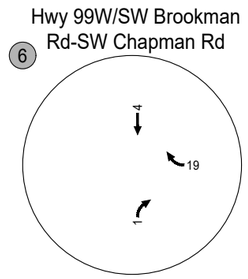


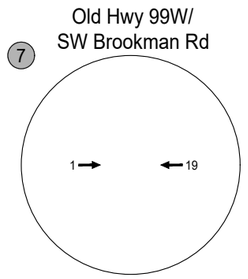


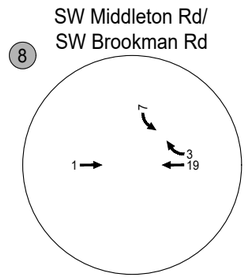


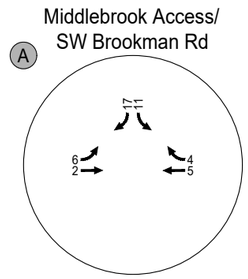


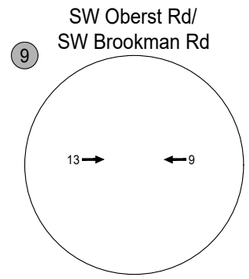


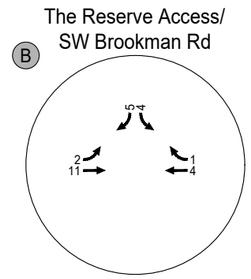


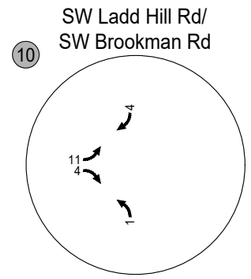






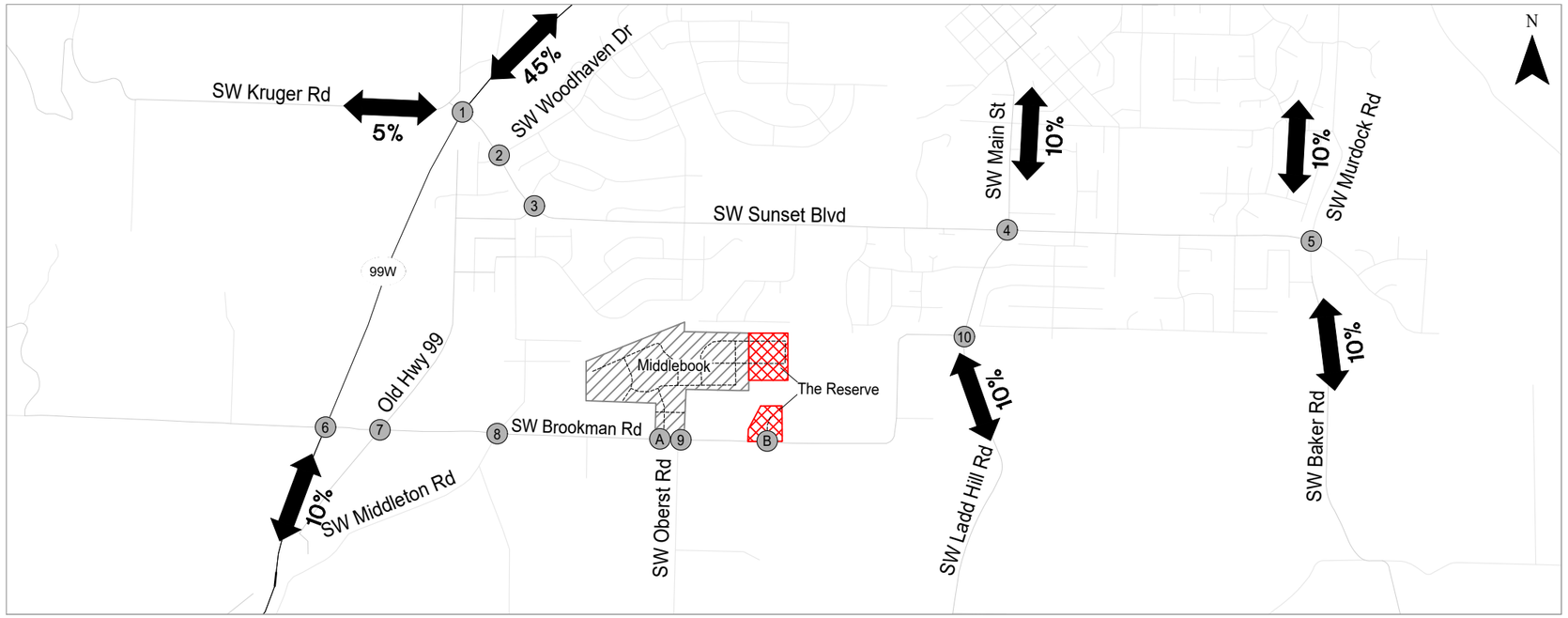


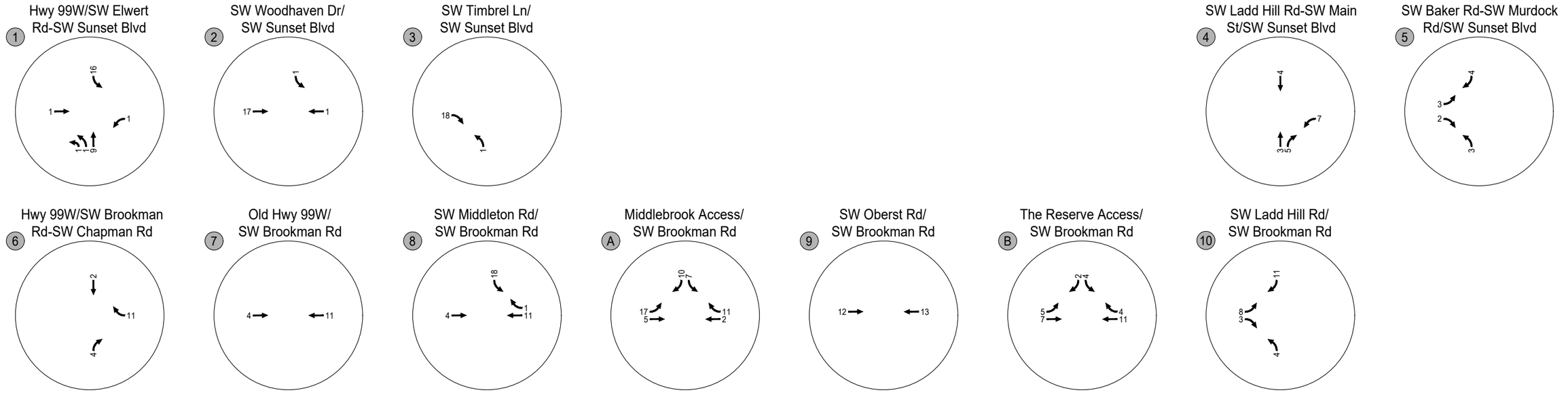




Assumed Trip Distribution and Assignment with RIRO at Highway 99W/SW Brookman Road-SW Chapman Road
Weekday AM Peak Hour
Sherwood, Oregon

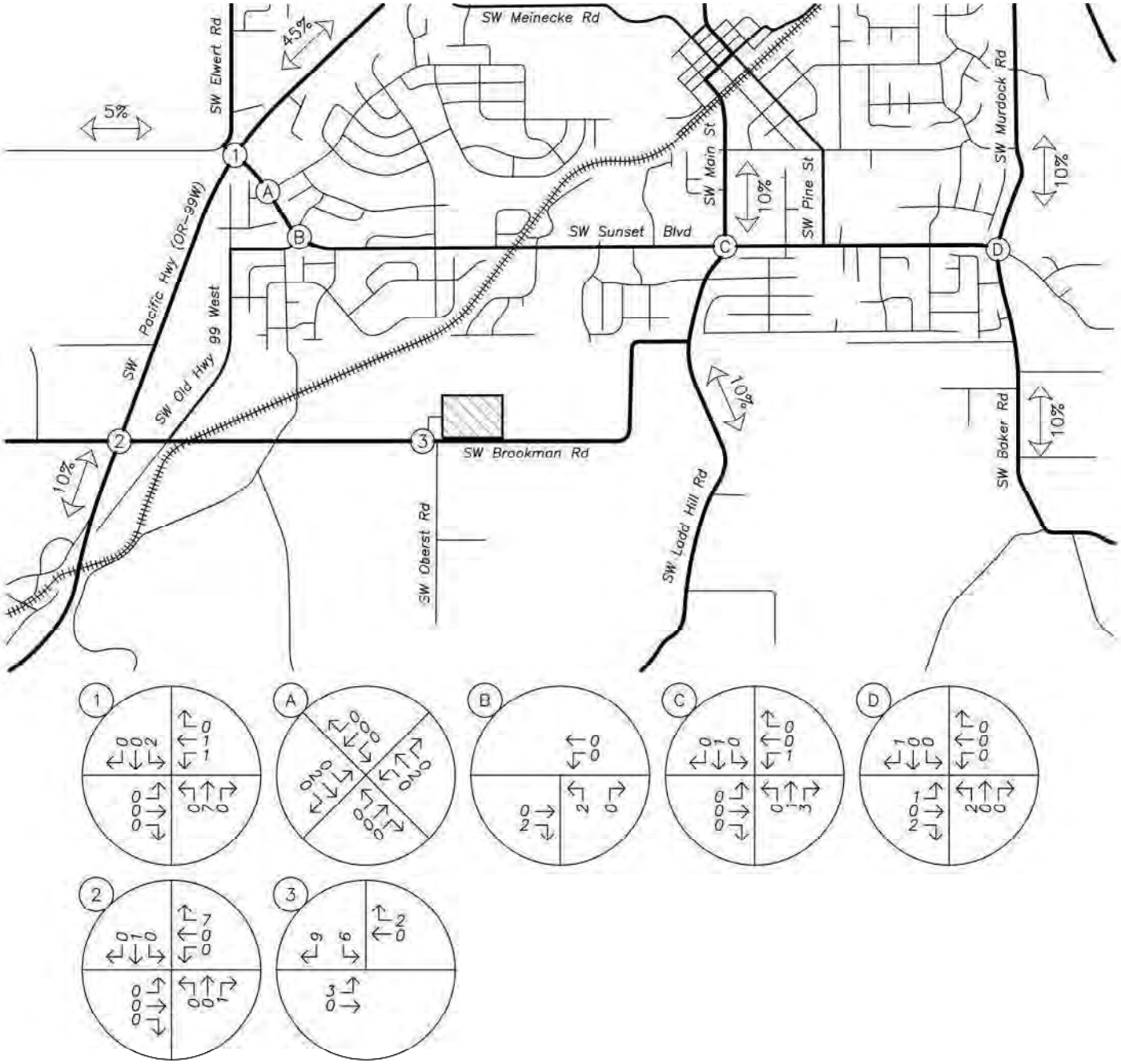
Figure
10





Assumed Trip Distribution and Assignment with RIRO at Highway 99W/SW Brookman Road-SW Chapman Road
Weekday PM Peak Hour
Sherwood, Oregon

Figure
11



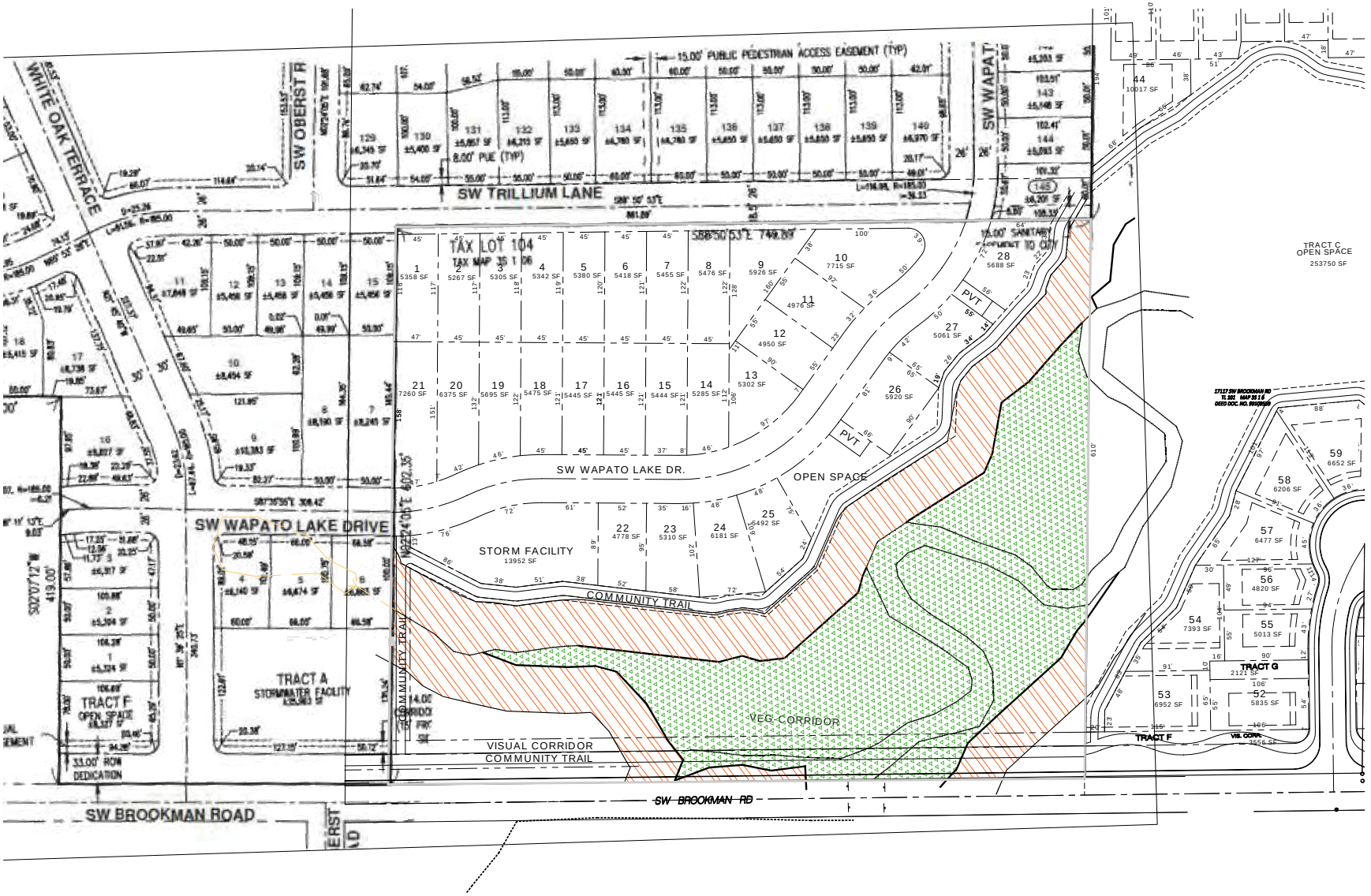
no scale

SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM Peak Hour

Figure 2
Cedar Creek Subdivision
3/31/2020

Exhibit A27



TVWD FILE #?????
WACO CASEFILE # ??-???-?

PIONEER DESIGN GROUP
9465 SW BEVERA CREEK | SUITE 100 | HILLSBORO, OREGON 97123
PORTLAND | OREGON | HONOLULU, HAWAII
PH: 503.643.3286
WWW.PIO-GRP.COM

PRELIMINARY SITE PLAN

SCOTT PROPERTY
CITY OF SHERWOOD, OREGON

Designed by MLS Date 10/29
Drawn by TCC Date 10/29
Reviewed by MLS Date 10/29
Project No. 131-999 REF.
Horiz. Scale: 1"=50'
Vert. Scale:

No.	Revision	By	Date

Project SCOTT PROPERTY
No. 131-999
Type PLANNING
Sheet P0.0

B:\Projects\131-999\Brookman Road\Scott Property\P2.dwg 10/10/2019 3:58:51 PM

1 - 4 of 63 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02154	N	N	N	N	N	N	05/01/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY							WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	NONE	N	DRY	REAR		PRVTE	NE-SW									000	00
N							5P	PORTLAND UA	16.57		SW ELWERT RD	03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		043	000		07
N							45 21 16.15	-122 51 59.28			009100100S00		(04)													OR<25					
																		02	NONE 0	STOP										
																			PRVTE	NE-SW									011	00
																			PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		000	000		00
																										OR<25				
08211	N	N	N	N			11/30/2016	WASHINGTON	1 14			STRGHT		N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										29
NONE							WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		N/A	NE-SW									000	00
N							3P	PORTLAND UA	16.60		SW SUNSET BLVD	03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 14.96	-122 52 .91			009100100S00		(04)													UNK					
																		02	NONE 9	STOP										
																			N/A	NE-SW									011	00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
04096	N	N	N	N	N	N	08/12/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY							MO	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000	00
N							4P	PORTLAND UA	16.60		SW ELWERT RD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		043	000		07
N							45 21 14.96	-122 52 .91			009100100S00		(04)													OR>25					
																		02	NONE 0	STOP										
																			PRVTE	NE-SW									011	00
																			PSNGR CAR		01	DRVR	INJC	36	F	OR-Y		000	000		00
																										OR<25				
07960	N	N	N	N			12/22/2015	WASHINGTON	1 14			STRGHT		N	N	RAIN	S-1STOP	01	NONE 1	STRGHT										29
NO RPT							TU	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	NE-SW									000	00
N							4P	PORTLAND UA	16.61		SW ELWERT RD	04			N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	72	M	OR-Y		026	000		29
N							45 21 14.53	-122 52 1.4			009100100S00		(04)													OR<25					
																		02	NONE 0	STOP										
																			PRVTE	NE-SW									011	00
																			PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000		00
																										OR<25				
																		02	NONE 0	STOP										
																			PRVTE	NE-SW									011	00
																			PSNGR CAR		02	PSNG	INJC	65	M			000	000		00
03457	N	N	N	N			06/21/2015	WASHINGTON	1 14			STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										29
NONE							SU	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000	00
N							6P	PORTLAND UA	16.64		SW SUNSET BLVD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		042	000		29
N							45 21 13.21	-122 52 2.83			009100100S00		(04)													OR>25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J G N	S H V	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	INJC	18	F	OR-Y OR<25		000	006 000		00 00
04458 NONE N N	N	N	N N	N		08/06/2015 TH 6P 45 21 13.21	WASHINGTON SHERWOOD PORTLAND UA -122 52 2.83	1 14 MN 0 16.64	SW PACIFIC HY 99W SW SUNSET BLVD 009100100S00	STRGHT NE 04	(DIVMD) (04)	N UNKNOWN	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	F	UNK		026	000		29 00 29
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	30	F	OR-Y OR<25		000	011 000		00 00
03929 NONE N N	N	N	N N	N		06/15/2016 WE 3P 45 21 13.21	WASHINGTON SHERWOOD PORTLAND UA -122 52 2.83	1 14 MN 0 16.64	SW PACIFIC HY 99W SW ELWERT RD 009100100S00	STRGHT NE 04	(DIVMD) (04)	N UNKNOWN	N N	CLR DRY DAY	S-STRGHT SS-O PDO	01	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000		13 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
03493 NONE N N	N	N	N N	N		05/28/2016 SA 11A 45 21 12.76	WASHINGTON SHERWOOD PORTLAND UA -122 52 3.29	1 14 MN 0 16.65	SW PACIFIC HY 99W SW SUNSET BLVD 009100100S00	STRGHT NE 03	(DIVMD) (04)	Y UNKNOWN	N N	CLR DRY DAY	S-STRGHT REAR PDO	01	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000		29 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
80504 NONE N N	N	N	N N	N		05/17/2018 TH 4P 45 21 12.75	WASHINGTON SHERWOOD PORTLAND UA -122 52 3.29	1 14 MN 0 16.65	SW PACIFIC HY 99W SW SUNSET BLVD 009100100S00	STRGHT NE 03	(DIVMD) (04)	Y UNKNOWN	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	46	M	OR-Y OR<25		026	000		29 00 29
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	32	M	OR-Y OR<25		000	011 000		00 00
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	02	PSNG	INJC	31	M			000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R E A	M J U G	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
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NONE							MO	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	NE-SW									000	00
N							3P	PORTLAND UA	16.65		SW SUNSET BLVD	04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		026	000		29
N							45 21 12.76	-122 52 3.29			009100100S00		(04)													OR<25					
																		02	NONE 0	STOP										
																			PRVTE	NE-SW									011	00
																			PSNGR CAR		01	DRVR	INJC	60	F	OR-Y		000	000		00
																										OR<25					
00684	N	N	N	N	N	N	02/08/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
CITY							TH	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		UNKN	NE-SW									000	00
N							6P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		026	000		29
N							45 21 11.85	-122 52 4.18			009100100S00															UNK					
																		02	NONE 0	STOP										
																			PRVTE	NE-SW									011	00
																			PSNGR CAR		01	DRVR	INJC	49	F	OR-Y		000	000		00
																										OR<25					
02155	N	N	N	N	N	N	04/30/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT										07
CITY							MO	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000	00
N							5P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00															UNK					
																		02	NONE 9	STOP										
																			N/A	NE-SW									011	00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
07290	N	N	N	N			12/19/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT										07
CITY							WE	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000	00
N							4P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00															UNK					
																		02	NONE 9	STOP										
																			N/A	NE-SW									011	00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
00764	N	N	N	N			02/13/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							WE	SHERWOOD	MN 0		SW ELWERT RD	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000	00
N							2P	PORTLAND UA	16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 11.85	-122 52 4.18			009100100S00															UNK					
																		02	NONE 9	STOP										
																			N/A	NE-SW									011	00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U G	M J / N V	S / H L	W / O / R / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04035	N	N	N	N	N	N	08/08/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	TURN-L										29
CITY				TH			SHERWOOD		MN 0		SW ELWERT RD	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NW								000		00
N				3P			PORTLAND UA		16.67		SW PACIFIC HY 99W	05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		026	000		29
N				45 21 11.85			-122 52 4.18				009100100S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NW								011		00
																			PSNGR CAR		01	DRVR	INJC	38	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NW								011		00
																			PSNGR CAR		02	PSNG	INJB	43	F			000	000		00
05867	N	N	N	N			10/28/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-STP	01	NONE 9	TURN-R										08
NONE				SU			SHERWOOD		MN 0		SW ELWERT RD	NW		TRF SIGNAL	N	WET	TURN		N/A	NW-SE								000		00
N				UNK			PORTLAND UA		16.67		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 21 11.85			-122 52 4.18				009100100S00															UNK					
																		02	NONE 9	STOP										
																			N/A	NW-SE								012		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
00404	N	N	N	N	N	N	01/23/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
COUNTY				FR					MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S								000		00
N				6A			PORTLAND UA		16.67			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		020	000		04
N				45 21 11.85			-122 52 4.18				009100100S00															OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	S -W								000		00
																			PSNGR CAR		01	DRVR	INJC	29	M	OR-Y		000	000		00
																										OR>25					
03342	N	N	N	N	N	N	06/06/2017	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										087	27,04
CITY				TU					MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -W								000		00
N				2P			PORTLAND UA		16.67			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	21	M	OR-Y		016,004,020	038		27,04
N				45 21 11.85			-122 52 4.18				009100100S00															OR>25					
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		01	DRVR	INJC	25	F	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		02	PSNG	NO<5	01	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	087	00
																			PSNGR CAR		03	PSNG	NO<5	02	F			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	D R / U G / S	M J / N H / V L	S / C	W / O / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02588	N	N	N	N	N	N	05/23/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
CITY			WE				SHERWOOD		MN 0		SW ELWERT RD	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	NE-SW								000		00
N			5A				PORTLAND UA		16.67		SW PACIFIC HY 99W	01	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		000	000		00
N			45 21 11.85				-122 52 4.18				009100100S00															OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	SW-NW								000		00
																			PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		020	000		04
																										OR<25					
05940	N	N	N	N	N	N	11/03/2018	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT										013	02,29
CITY			SA				SHERWOOD		MN 0		SW ELWERT RD	CN		L-GRN-SIG	N	WET	TURN		PRVTE	NE-SW								022	013	00
N			8P				PORTLAND UA		16.67		SW PACIFIC HY 99W	01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	55	F	SUSP		000	000		00
N			45 21 11.84				-122 52 4.18				009100100S00															OR<25					
																		02	NONE 0	TURN-L										
																			PRVTE	SW-NW								022		00
																			TRUCK		01	DRVR	NONE	35	M	OR-Y		004,028	000		02
																										OR<25					
																		03	NONE 0	STRGHT										
																			PRVTE	NE-SW								000		00
																			PSNGR CAR		01	DRVR	NONE	24	F	SUSP		026	000		29
																										N-RES					
06954	N	N	N	N	N	N	12/18/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	TURN-L										04
CITY			TU						MN 0			CN		L-GRN-SIG	N	WET	TURN		PRVTE	SW-NW								000		00
N			2P				PORTLAND UA		16.67			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	22	F	OR-Y		020,004	000		04
N			45 21 11.85				-122 52 4.19				009100100S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	NE-SW								000		00
																			PSNGR CAR		01	DRVR	INJB	56	F	OR-Y		000	000		00
																										OR<25					
05733	N	N	N	N	N	N	10/26/2018	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 9	STRGHT										04
CITY			FR				SHERWOOD		MN 0		SW ELWERT RD	CN		TRF SIGNAL	N	WET	TURN		N/A	NE-SW								000		00
N			1P				PORTLAND UA		16.67		SW PACIFIC HY 99W	01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 21 11.85				-122 52 4.18				009100100S00															UNK					
																		02	NONE 9	TURN-L										
																			N/A	SW-NW								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
03825	N	N	N	N			07/08/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	BIKE	01	NONE 0	TURN-L										02
NONE			WE						MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SE-SW								000		00
N			7P				PORTLAND UA		16.67			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	F	OTH-Y		027	000		02
N			45 21 11.85				-122 52 4.18				009100100S00															OR<25					
																				-										
																				STRGHT	01	BIKE	INJB	23	M		I INRD	000	035		00
																				NW SE										

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J U V	S I N L	C N H K	W O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03238	N	N	N	N	N	N	N	06/25/2018	WASHINGTON	1 14			INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										010	04
CITY				MO				SHERWOOD		MN 0		SW ELWERT RD	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	NE-SW								000	010	00
N				2P				PORTLAND UA		16.67		SW PACIFIC HY 99W	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	18	F	OR-Y		020	000		04
N				45 21 11.85				-122 52 4.18				009100100S00															OR<25					
																			02	NONE 0	STRGHT											
																				PRVTE	NW-SE								000		00
																				PSNGR CAR		01	DRVR	NONE	69	M	OR-Y		000	000		00
																											OR<25					
03471	Y	Y	N	N	N	N	N	06/22/2015	WASHINGTON	1 14			STRGHT		N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT										079,010	01
CITY				MO						MN 0		Not Related to Intersection	UN	(DIVMD)	UNKNOWN	N	DRY	FIX		PRVTE	NE-SW								000	079,010	00
Y				2A				PORTLAND UA		16.68			01			N	DARK	INJ		MTRCYCLE		01	DRVR	INJA	44	M	OR-Y		047,080,081	000		01
N				45 21 11.41				-122 52 4.6				009100100S00		(04)													OR<25					
03619	N	N	N	N				07/05/2018	WASHINGTON	1 14			STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											29
NONE				TH						MN 0			UN	(NONE)	UNKNOWN	N	DRY	REAR		N/A	NE-SW								000		00
N				6P				PORTLAND UA		16.73			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 21 9.15				-122 52 6.49				009100100S00		(02)													UNK					
																			02	NONE 9	STRGHT											
																				N/A	NE-SW								006		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
05208	N	N	N	N				10/03/2018	WASHINGTON	2 14			STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE				WE				SHERWOOD		MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	SW-NE								000		00
N				6A				PORTLAND UA		16.55		SW SUNSET BLVD	00			N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		026	000		29
N				45 21 15.95				-122 51 58.08				009100200S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJB	36	F	OR-Y		000	000		00
																											OR<25					
01494	N	N	N	N				03/17/2017	WASHINGTON	2 14			STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE				FR				SHERWOOD		MN 0		SW PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	SW-NE								000		00
N				6A				PORTLAND UA		16.57		SW SUNSET BLVD	04			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		026	000		29
N				45 21 15.23				-122 51 59.17				009100200S00		(04)													OR<25					
																			02	NONE 0	STOP											
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		000	000		00
																											OR<25					
																			02	NONE 0	STOP											
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		02	PSNG	INJC	24	F			000	000		00
																			02	NONE 0	STOP											
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		03	PSNG	NO<5	03	M			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R E A	M J L G	S U S N	W I V H	C N L L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04491	N	N	N	N				04/13/2016	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE								WE	SHERWOOD	MN 0		SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW								000		00
N								5P	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 11.45	-122 52 3.31			009100200S00															UNK					
																			02	NONE 9	STOP										
																				N/A	NE-SW								011		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK				
04670	N	N	N	N	N	N		07/31/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										07
CITY								MO	SHERWOOD	MN 0		SW ELWERT RD	NE		UNKNOWN	N	DRY	REAR		PRVTE	NE-SW								000		00
N								4P	PORTLAND UA	16.66		SW PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	16	M	OR-Y		043	000		07
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			01	NONE 0	STRGHT										
																				PRVTE	NE-SW								000		00
																				PSNGR CAR		02	PSNG	INJC	18	F		000	000		00
																			02	NONE 0	STRGHT										
																				PRVTE	NE-SW								006		00
																				PSNGR CAR		01	DRVR	INJC	18	F	OR-Y	000	000		00
																											OR<25				
04289	N	N	N	N				04/27/2017	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE								TH	SHERWOOD	MN 0		SW PACIFIC HY 99W	E		TRF SIGNAL	N	DRY	REAR		N/A	SE-NW								000		00
N								7A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 11.45	-122 52 3.31			009100200S00															UNK					
																			02	NONE 9	STOP										
																				N/A	SE-NW								013		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK				
04990	N	N	N	N	N	N		07/21/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY								TU	SHERWOOD	MN 0		SW ELWERT RD	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								4P	PORTLAND UA	16.66		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	29	F	SUSP		043	000		07
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					
																			02	NONE 0	STOP										
																				PRVTE	SW-NE								011		00
																				PSNGR CAR		01	DRVR	NONE	61	M	OR-Y	000	000		00
																											OR<25				
05463	N	N	N	N				09/04/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE								FR	SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N								11A	PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		026	000		29
N								45 21 11.45	-122 52 3.31			009100200S00															OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	C O R K	W DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH COLL SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																									OR<25					
01834	Y	Y	N	N	N	N	03/19/2016	WASHINGTON	2 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										013	07,30
CITY			SA				SHERWOOD		MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N			6P				PORTLAND UA		16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	NONE		043,050	000		07,30
N			45 21 11.45				-122 52 3.31			009100200S00															OR<25					
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									012	013	00
																		PSNGR CAR		01	DRVR	INJC	46	M	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									012	013	00
																		PSNGR CAR		02	PSNG	INJC	28	F			000	000		00
																	03	NONE 0	STOP										
																		PRVTE	SW-NE									022		00
																		PSNGR CAR		01	DRVR	NONE	34	M	OR-Y		000	000		00
																									OR<25					
02965	N	N	N	N			05/06/2016	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE			FR				SHERWOOD		MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N			8A				PORTLAND UA		16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		026	000		29
N			45 21 11.45				-122 52 3.31			009100200S00															OR<25					
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		01	DRVR	INJC	40	M	OR-Y		000	000		00
																									OR<25					
06420	N	N	N	N	N	N	09/22/2016	WASHINGTON	2 14		INTER	CROSS	N	N	CLD	S-STRGHT	01	NONE 0	STRGHT										087	07
CITY			TH				SHERWOOD		MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	SNO	REAR		PRVTE	SW-NE								000	087	00
N			5P				PORTLAND UA		16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y		043	000		07
N			45 21 11.45				-122 52 3.31			009100200S00															OR<25					
																	02	NONE 0	STRGHT										
																		PRVTE	SW-NE									006	087	00
																		PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		000	000		00
																									OR<25					
08928	N	N	N	N			12/25/2016	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE			SU				SHERWOOD		MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N			12P				PORTLAND UA		16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y		026	000		29
N			45 21 11.45				-122 52 3.31			009100200S00															OR<25					
																	02	NONE 0	STOP										
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		01	DRVR	INJC	59	F	OR-Y		000	000		00
																									OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J U N V	S I H L	C O R K	W	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		02	PSNG	INJC	40	M			000	000		00
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		03	PSNG	INJC	54	M			000	000		00
07321	N	N	N	N	N	N		11/18/2017	WASHINGTON	2 14		INTER	CROSS	N	N	FOG	S-STRGHT	01	NONE 9	STRGHT										07
CITY			SA						SHERWOOD	MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		N/A	SW-NE								000		00
N			8P						PORTLAND UA	16.66	SW SUNSET BLVD	06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 21 11.45						-122 52 3.31		009100200S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	SW-NE									006		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
01690	N	N	N	N	N	N		04/04/2019	WASHINGTON	2 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										07
CITY			TH						SHERWOOD	MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE								000		00
N			7A						PORTLAND UA	16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		043	000		07
N			45 21 11.45						-122 52 3.31		009100200S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		000	000		00
																										OR<25					
03081	N	N	N	N	N	N		06/16/2019	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
CITY			SU						SHERWOOD	MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N			3P						PORTLAND UA	16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		026	000		29
N			45 21 11.45						-122 52 3.31		009100200S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	NONE	43	F	OR-Y		000	000		00
																										OR>25					
01913	N	N	N	N				04/16/2019	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NO RPT			TU						SHERWOOD	MN 0	SW PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		UNKN	SW-NE								000		00
N			4P						PORTLAND UA	16.66	SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000		29
N			45 21 11.45						-122 52 3.31		009100200S00															UNK					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		01	DRVR	INJC	28	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE									011		00
																			PSNGR CAR		02	PSNG	INJC	29	M			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J G U I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / TO / FROM	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02665	N	N	N N N	N	N	05/25/2019	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										27,29
CITY			SA				SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			4P				PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	21	M	OR-Y		016,026	038		27,29
N			45 21 11.45				-122 52 3.31			009100200S00															OR<25					
																	02	NONE 0	STOP											
																		RENTL	SW-NE									011		00
																		PSNGR CAR		01	DRVR	INJC	30	F	OTH-Y		000	000		00
																									N-RES					
																	02	NONE 0	STOP											
																		RENTL	SW-NE									011		00
																		PSNGR CAR		02	PSNG	INJC	36	M			000	000		00
																	02	NONE 0	STOP											
																		RENTL	SW-NE									011		00
																		PSNGR CAR		03	PSNG	INJC	21	M			000	000		00
06006	N	N	N N		Y	11/15/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											10
CITY			FR				SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			6A				PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		000	000		00
N			45 21 11.45				-122 52 3.31			009100200S00															OR<25					
																	02	NONE 0	STOP											
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		009	000		10
																									OR<25					
06647	N	N	N N		Y	12/14/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											27,07
CITY			SA				SHERWOOD	MN 0		SW PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW-NE									000		00
N			1P				PORTLAND UA	16.66		SW SUNSET BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	F	SUSP		016,043	038		27,07
N			45 21 11.45				-122 52 3.31			009100200S00															UNK					
																	02	NONE 0	STOP											
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	STOP											
																		PRVTE	SW-NE									011		00
																		PSNGR CAR		02	PSNG	INJC	63	M			000	000		00
04827	N	N	N N N	N	N	08/24/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY			MO				SHERWOOD	MN 0		SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW-NE									000		00
N			1P				PORTLAND UA	16.66		SW SUNSET BLVD	02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	93	F	OR-Y		020	000		04
N			45 21 11.45				-122 52 3.31			009100200S00															OR<25					
																	02	NONE 0	TURN-L											
																		PRVTE	SE-SW									000		00
																		PSNGR CAR		01	DRVR	INJB	35	F	OR-Y		000	000		00
																									OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	C O R L	W K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / OWNER / TRLR QTY / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 0	TURN-L										
																		PRVTE	SE-SW									000		00
																		PSNGR CAR		02	PSNG	INJC	05	M			000	000		00
05220	N	N	N	N	N	N	10/03/2018	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04,27
CITY			WE				SHERWOOD	MN 0	SW PACIFIC HY 99W	CN		TRF SIGNAL	N		DRY	ANGL		PRVTE	SE-NW									000		00
N			11A				PORTLAND UA	16.66	SW SUNSET BLVD	02	0		N		DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		000	000		00
N			45 21 11.45				-122 52 3.31		009100200S00																OR<25					
																	01	NONE 0	STRGHT											
																		PRVTE	SE-NW									000		00
																		PSNGR CAR		02	PSNG	INJC	24	F			000	000		00
																	02	NONE 0	STRGHT											
																		PRVTE	SW-NE									000		00
																		PSNGR CAR		01	DRVR	INJC	55	M	OTH-Y N-RES		020,016	038		04,27
06861	N	N	N	N	N	N	10/30/2017	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L											04
CITY			MO				SHERWOOD	MN 0	SW ELWERT RD	CN		TRF SIGNAL	N		DRY	TURN		N/A	SE-SW									000		00
N			6A				PORTLAND UA	16.66	SW PACIFIC HY 99W	03	0		N		DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 21 11.45				-122 52 3.31		009100200S00																UNK					
																	02	NONE 9	STRGHT											
																		N/A	NW-SE									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
05152	N	N	N	N	N	N	08/23/2017	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY			WE				SHERWOOD	MN 0	SW PACIFIC HY 99W	CN		TRF SIGNAL	N		DRY	ANGL		PRVTE	SW-NE									000		00
N			12P				PORTLAND UA	16.66	SW SUNSET BLVD	04	0		N		DAY	INJ		PSNGR CAR		01	DRVR	NONE	59	M	EXP		020	000		04
N			45 21 11.45				-122 52 3.31		009100200S00																OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	NW-SE									000		00
																		PSNGR CAR		01	DRVR	INJC	36	F	OR-Y OR<25		000	000		00
																	03	NONE 0	TURN-R											
																		PRVTE	SE-NE									022		00
																		PSNGR CAR		01	DRVR	INJC	19	F	OR-Y OR<25		000	000		00
02603	N	N	N	N	N	N	05/13/2015	WASHINGTON	2 14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
CITY			WE					MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N									000		00
N			7A				PORTLAND UA	16.68		03				N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	48	F	OR-Y		043	000		07
N			45 21 10.55				-122 52 4.06		009100200S00			(04)														OR<25					
																	02	NONE 0	STOP											
																		PRVTE	S -N									011		00
																		PSNGR CAR		01	DRVR	INJC	45	F	OR-Y OR<25		000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A C	M J U S	S E G V	W I N L	C C H K	O O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06998	N	Y	N	N	N	N	N	12/20/2018	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
CITY								TH		MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N								5P	PORTLAND UA	16.68			04			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		043	000		07
N								45 21 10.56	-122 52 4.05			009100200S00		(04)													OR<25					
																			02	NONE 0	STOP										
																				PRVTE	S -N								011		00
																				PSNGR CAR		01	DRVR	INJC	30	M	OTH-Y		000	000		00
																											N-RES				
04365	N	N	N	N	N	N	N	08/02/2015	WASHINGTON	2	14		STRGHT		N	N	CLD	S-1STOP	01	NONE 0	STRGHT										33
CITY								SU		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	S -N								000		00
N								9P	PORTLAND UA	16.69			03			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	38	F	SUSP		051,026	000		33
N								45 21 10.11	-122 52 4.43			009100200S00		(04)													OR<25					
																			02	NONE 0	STOP										
																				PRVTE	S -N								011		00
																				PSNGR CAR		01	DRVR	INJB	60	F	OTH-Y		000	000		00
																											N-RES				
06659	N	N	N	N	N	N	N	11/06/2015	WASHINGTON	2	14		STRGHT		Y	N	FOG	S-1STOP	01	NONE 0	STRGHT										07
CITY								FR		MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N								7A	PORTLAND UA	16.69			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		043,026	000		07
N								45 21 10.11	-122 52 4.43			009100200S00		(02)													OR<25					
																			02	NONE 0	STOP										
																				PRVTE	S -N								011		00
																				PSNGR CAR		01	DRVR	NONE	31	F	OR-Y		000	000		00
																											OR<25				
08008	N	N	N	N	N	N	N	12/14/2017	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT									087	29
CITY								TH		MN 0			UN	(DIVMD)	TRF SIGNAL	N	DRY	REAR		PRVTE	S -N								000	087	00
N								1P	PORTLAND UA	16.69			03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	68	M	OR-Y		042	000		29
N								45 21 10.11	-122 52 4.43			009100200S00		(04)													OR<25					
																			02	NONE 0	STRGHT										
																				PRVTE	S -N								006	087	00
																				PSNGR CAR		01	DRVR	NONE	68	F	OR-Y		000	000		00
																											OR<25				
04297	N	Y	N	N	N	N	N	08/24/2019	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										07
CITY								SA		MN 0			UN	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	S -N								000		00
N								3P	PORTLAND UA	16.69			03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	M	OTH-Y		043	000		07
N								45 21 10.11	-122 52 4.44			009100200S00		(04)													OR<25					
																			02	NONE 0	STRGHT										
																				PRVTE	S -N								006		00
																				PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		000	000		00
																											OR<25				
																			02	NONE 0	STRGHT										
																				PRVTE	S -N								006		00
																				PSNGR CAR		02	PSNG	INJA	26	M			000	000		00
06116	N	N	N	N	N	N	N	10/02/2017	WASHINGTON	2	14		STRGHT		N	N	CLD	S-STRGHT	01	NONE 9	STRGHT										27,07
CITY								MO		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	S -N								000		00
N								5A	PORTLAND UA	16.69			04			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 10.11	-122 52 4.43			009100200S00		(04)													UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	006 000		00 00
05060 CITY N N	N	N	N	N			09/03/2015 TH 5P 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 009100200S00		STRGHT UN 03	(DIVMD) (04)	N UNKNOWN	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	26	F	OR-Y OR<25		043	000	013	07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	27	F	OR-Y OR<25		000	011 000	013	00 00
																	03	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	NONE	30	F	OR-Y OR<25		000	022 000		00 00
07488 CITY N N	N	N	N	N	N	N	12/08/2015 TU 12P 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 009100200S00		STRGHT UN 03	(DIVMD) (05)	N L-GRN-SIG	N N	RAIN WET DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	INJC	25	F	OR-Y OR<25		043	000		07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	NONE	57	F	OR-Y OR<25	000	000	011 000		00 00
07584 NONE N N	N	N	N	N			12/11/2015 FR 7A 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.79	2 14 MN 0 16.70 009100200S00		STRGHT UN 03	(DIVMD) (04)	N UNKNOWN	N N	UNK UNK DAWN	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	32	F	OR-Y UNK		026	000 000		29 00 29
																	02	NONE 0 PRVTE PSNGR CAR	STOP SW-NE	01	DRVR	INJC	40	F	OR-Y OR<25	000	000	011 000		00 00
04867 COUNTY N N	N	N	N	N	N	N	09/21/2019 SA 10A 45 21 9.65	WASHINGTON PORTLAND UA -122 52 4.77	2 14 MN 0 16.70 009100200S00		STRGHT UN 04	(DIVMD) (04)	N NONE	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	31	M	OTH-Y OR<25		043	000		07 00 07
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	01	DRVR	INJC	23	F	OR-Y OR<25	000	000	011 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	02	PSNG	INJC	22	F		000	000	011 000		00 00
																	02	NONE 0 PRVTE PSNGR CAR	STOP S -N	03	PSNG	INJC	17	M		000	000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A C	M J U S	S N G V	W I H L	C O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06414	N	N	N	N	N	N	09/22/2016	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT										29
CITY							TH		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	S -N									000		00
N							1P	PORTLAND UA	16.71			04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 9.19	-122 52 5.13			009100200S00		(04)													UNK					
																		02	NONE 9	STRGHT											
																			N/A	S -N									000		00
																			TRUCK		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
01275	N	N	N	N	N	N	03/05/2017	WASHINGTON	2	14		STRGHT		N	N	CLD	S-1STOP	01	NONE 0	STRGHT										07,32
CITY							SU		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	S -N								000		00
N							11A	PORTLAND UA	16.71			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	81	M	OR-Y		043,052	000		07,32
N							45 21 9.19	-122 52 5.13			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	S -N									011	013	00
																			PSNGR CAR		01	DRVR	INJC	69	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP											
																			PRVTE	S -N									011	013	00
																			PSNGR CAR		02	PSNG	INJC	63	F			000	000		00
																		03	NONE 0	STOP											
																			PRVTE	S -N									022		00
																			PSNGR CAR		01	DRVR	INJC	71	M	OR-Y		000	000		00
																										OR<25					
05618	N	N	N	N	N	N	09/20/2017	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	07
CITY							WE		MN 0			UN	(DIVMD)	TRF SIGNAL	N	WET	REAR		PRVTE	S -N								000		00
N							3P	PORTLAND UA	16.71			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		043	000		07
N							45 21 9.19	-122 52 5.13			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	S -N									011	013	00
																			PSNGR CAR		01	DRVR	INJB	52	M	OR-Y		000	000		00
																										OR<25					
																		03	NONE 0	STOP											
																			PRVTE	S -N									022		00
																			PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000		00
																										OR<25					
01240	N	N	N	N	N	N	03/12/2019	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
COUNTY							TU		MN 0			UN	(DIVMD)	UNKNOWN	N	WET	REAR		PRVTE	S -N								000		00
N							7A	PORTLAND UA	16.71			04			N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		043	000		07
N							45 21 9.18	-122 52 5.13			009100200S00		(04)													OR<25					
																		02	NONE 0	STOP											
																			PRVTE	S -N									011		00
																			PSNGR CAR		01	DRVR	INJC	43	M	OR-Y		000	000		00
																										OR<25					

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 17.41 to 17.51 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

1 - 7 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	M R G S	J U N V	S I H L	C N	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03760	N	N	N	N				07/24/2019	WASHINGTON	1 14			STRGHT		N	N	CLR	ANIMAL	01	NONE 9	STRGHT										035	12
NONE								WE		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	OTH		N/A	N -S									000		00
N								9P	PORTLAND UA	17.42			03			N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 35.36	-122 52 24.81			009100100S00		(04)													UNK					
06064	N	N	N	N				09/29/2017	WASHINGTON	1 14			INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT											29
NONE								FR		MN 0			N		STOP SIGN	N	WET	REAR		N/A	N -S									000		00
N								2P	PORTLAND UA	17.47			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															UNK					
																			02	NONE 9	STRGHT											
																				N/A	N -S									000		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
04243	N	N	N	N				08/16/2018	WASHINGTON	1 14			INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE								TH		MN 0			E		STOP SIGN	N	DRY	REAR		PRVTE	E -W									000		00
N								4P	PORTLAND UA	17.47			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		026	000		29
N								45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																			02	NONE 0	STOP											
																				PRVTE	E -W									012		00
																				PSNGR CAR		01	DRVR	INJC	53	F	OR-Y		000	000		00
																											OR<25					
01401	N	N	N	N	N	N		03/20/2018	WASHINGTON	1 14			INTER	CROSS	N	Y	CLD	FIX OBJ	01	NONE 9	STRGHT										058	26
COUNTY								TU		MN 0			S		STOP SIGN	N	DRY	FIX		N/A	N -S									000		00
N								2P	PORTLAND UA	17.47			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															UNK					
00236	N	N	N	N				01/15/2015	WASHINGTON	1 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY								TH		MN 0			CN		STOP SIGN	N	WET	TURN		PRVTE	N -S									000		00
N								5P	PORTLAND UA	17.47			01	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																			02	NONE 0	TURN-L											
																				PRVTE	E -S									015		00
																				PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		028	000		02
																											OR<25					
08443	N	N	N	N	N	N		12/09/2016	WASHINGTON	1 14			INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											03
COUNTY								FR		MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	N -S									000		00
N								3P	PORTLAND UA	17.47			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13			009100100S00															UNK					
																			02	NONE 9	STRGHT											
																				N/A	E -W									000		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
07975	N	N	N	N				12/13/2017	WASHINGTON	1 14			INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											03
COUNTY								WE		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	E -W									000		00
N								7P	PORTLAND UA	17.47			01	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	48	M	OR-Y		021	000		03
N								45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																			02	NONE 0	STRGHT											
																				PRVTE	N -S									000		00
																				PSNGR CAR		01	DRVR	INJC	56	F	OR-Y		000	000		00
																											OR<25					

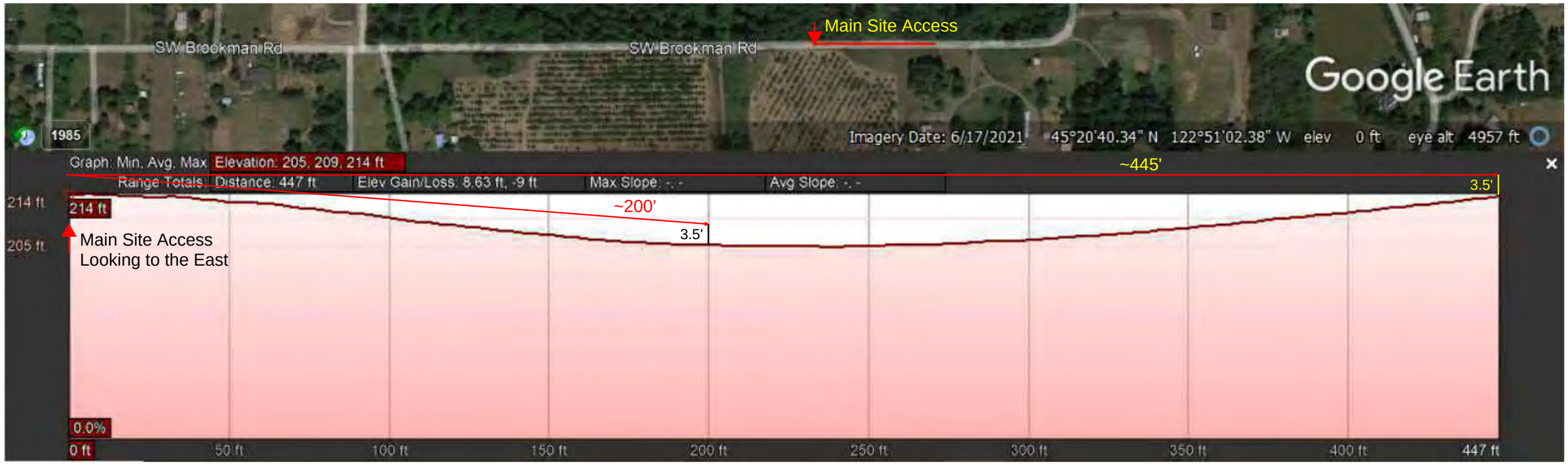
SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N H	W C O R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01598	N	N	N	N		03/21/2017	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											02
NO RPT						TU		MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	E -W									000		00
N						7A	PORTLAND UA	17.47			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															UNK					
																	02	NONE 9	STRGHT											
																		N/A	N -S									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
02701	N	N	N	N		05/18/2015	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											02
NO RPT						MO		MN 0			CN		STOP SIGN	N	DRY	TURN		PRVTE	W -E									000		00
N						5P	PORTLAND UA	17.47			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	40	F	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	TURN-L											
																		PRVTE	E -S									000		00
																		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		004,028	000		02
																									OR<25					
01335	N	N	N	N	N N	03/08/2017	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										058	02
COUNTY						WE		MN 0			CN		STOP SIGN	N	WET	ANGL		PRVTE	W -E									000	053	00
N						5P	PORTLAND UA	17.47			03	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	N -S									000		00
																		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		028	000		02
																									OR<25					
05249	N	N	N	N		08/27/2017	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L											02
NONE						SU		MN 0			CN		STOP SIGN	N	DRY	TURN		N/A	E -S									000		00
N						12P	PORTLAND UA	17.47			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															UNK					
																	02	NONE 9	STRGHT											
																		N/A	W -E									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
03053	N	N	N	N	N N	06/15/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						SA		MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S									000		00
N						2P	PORTLAND UA	17.47			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	24	M	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	W -E									015		00
																		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		028	000		02
																									OR<25					
05515	N	N	N	N	N N	10/24/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L											02
COUNTY						TH		MN 0			CN		STOP SIGN	N	DRY	TURN		PRVTE	E -S									000		00
N						11A	PORTLAND UA	17.47			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		000	000		00
N						45 20 32.89	-122 52 26.13			009100100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	W -E									000		00
																		PSNGR CAR		01	DRVR	INJC	47	F	OR-Y		028	000		02
																									OR<25					

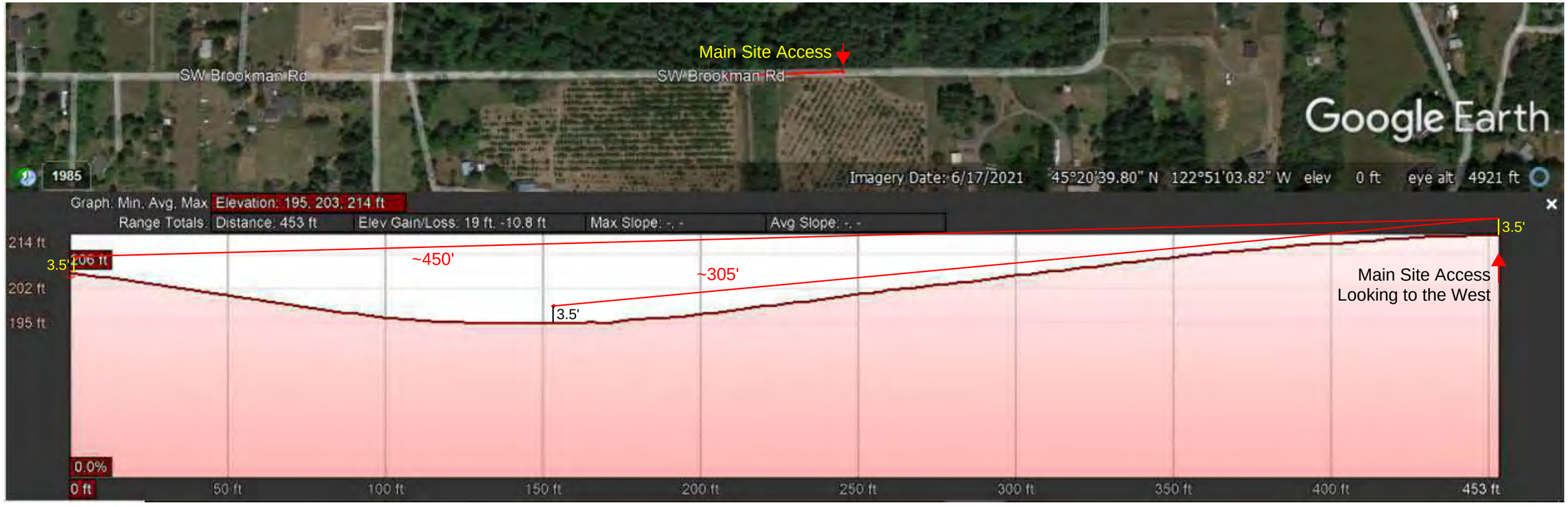
SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J U N V	S I H L	C N R K	O W	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06735	N	N	N	N	N	N	N	12/19/2019	WASHINGTON	1 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										02
COUNTY								TH		MN 0		CN		STOP SIGN	N	WET	ANGL		N/A	W -E								000		00
N								4P	PORTLAND UA	17.47		03	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.89	-122 52 26.13		009100100S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	N -S								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
03675	N	N	N	N	N	N	N	07/20/2019	WASHINGTON	1 14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT									010	13
COUNTY								SA		MN 0		UN	(DIVMD)	UNKNOWN	N	DRY	SS-O		PRVTE	N -S								000	010	00
N								9P	PORTLAND UA	17.50		04			N	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	21	M	UNK		045	000		13
N								45 20 31.43	-122 52 26.93		009100100S00		(04)													OR>25					
																		01	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		02	PSNG	INJB	00	M			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		01	DRVR	INJB	42	M	OR-Y		000	000		00
																										OR>25				
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		02	PSNG	INJB	13	F		000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		03	PSNG	INJB	15	F		000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	N -S								000	010	00
																			PSNGR CAR		04	PSNG	INJB	12	F		000	000		00
00536	Y	N	N	N	N	N	N	01/28/2017	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE 9	TURN-R										01,08
COUNTY								SA		MN 0		E		STOP SIGN	N	DRY	TURN		N/A	S -E								000		00
N								4P	PORTLAND UA	17.46		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.9	-122 52 24.87		009100200S00															UNK					
																		02	NONE 9	STOP										
																			N/A	E -W								011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
05762	N	N	N	N	N	N	N	09/18/2017	WASHINGTON	2 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										27,02
COUNTY								MO		MN 0		S		STOP SIGN	N	WET	TURN		N/A	N -S								000		00
N								10A	PORTLAND UA	17.46		03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 20 32.9	-122 52 24.87		009100200S00															UNK					
																		02	NONE 9	TURN-R										
																			N/A	W -S								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				

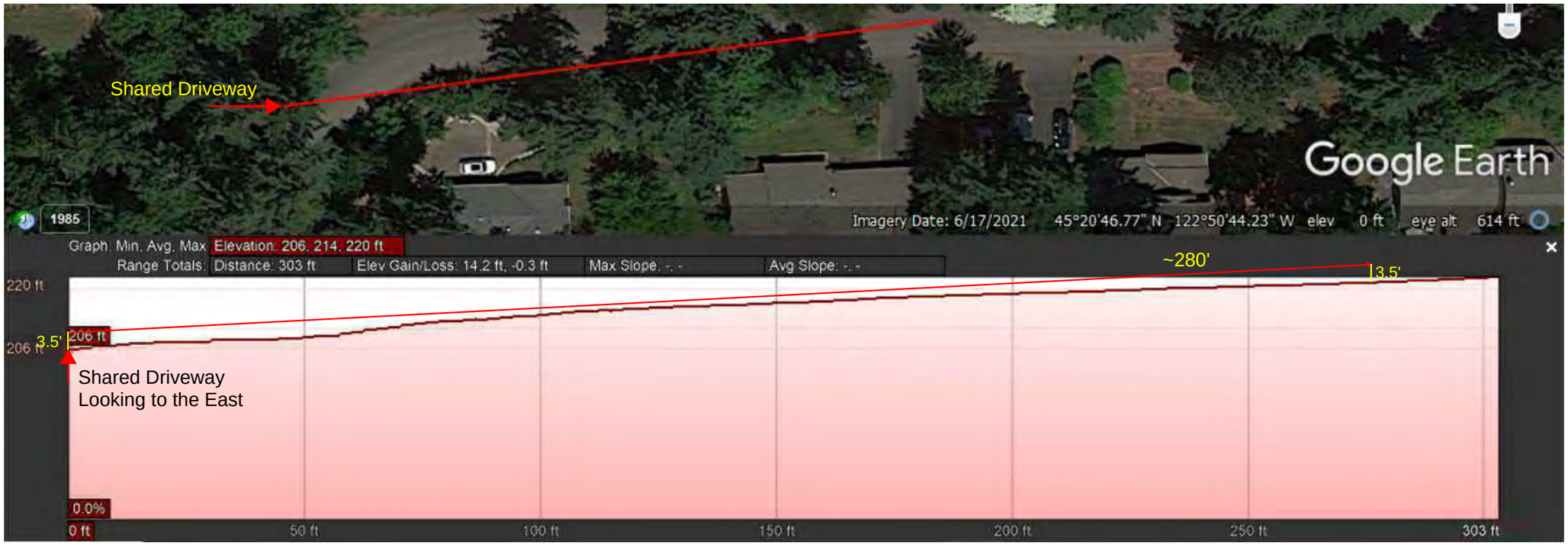
SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A C	M J U S	S W I V	C O N L	W H K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05017	N	N	N	N	N	N	09/29/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	TURN-L										08
COUNTY			SU						MN 0			W		STOP SIGN	N	DRY	TURN		PRVTE	E -S								000		00
N			2P				PORTLAND UA		17.46			05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		002	000		08
N			45 20 32.9				-122 52 24.87				009100200S00															OR<25				
																		02	NONE 0	STOP										
																			PRVTE	W -E								011		00
																			PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000		00
																										OR<25				
02243	N	N	N	N	N	N	04/27/2015	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY			MO						MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N			2P				PORTLAND UA		17.46			01	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJA	68	M	OTH-Y		000	000		00
N			45 20 32.9				-122 52 24.87				009100200S00															N-RES				
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								015		00
																			PSNGR CAR		01	DRVR	NONE	74	F	OR-Y		028	000		02
																										OR<25				
03254	N	N	N	N			05/18/2016	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										02
NO RPT			WE						MN 0			CN		STOP SIGN	N	DRY	TURN		N/A	W -N								000		00
N			6A				PORTLAND UA		17.46			02	0		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 20 32.9				-122 52 24.87				009100200S00															UNK				
																		02	NONE 9	STRGHT										
																			N/A	E -W								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
05465	N	N	N	N			10/15/2018	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY			MO						MN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N			6A				PORTLAND UA		17.46			02	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	INJC	39	M	OTH-Y		000	000		00
N			45 20 32.91				-122 52 24.87				009100200S00															N-RES				
																		01	NONE 0	STRGHT										
																			PRVTE	S -N								000		00
																			PSNGR CAR		02	PSNG	INJC	52	F			000	000		00
																		01	NONE 0	STRGHT										
																			PRVTE	S -N								000		00
																			PSNGR CAR		03	PSNG	INJC	32	F			000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								000		00
																			PSNGR CAR		01	DRVR	INJB	60	M	OR-Y		028	000		02
																										OR<25				
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								000		00
																			PSNGR CAR		02	PSNG	INJB	55	M			000	000		00
07013	N	N	N	N	N	N	12/20/2018	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT										02
COUNTY			TH						MN 0			CN		STOP SIGN	N	WET	ANGL		N/A	E -W								000		00
N			6P				PORTLAND UA		17.46			02	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 20 32.9				-122 52 24.87				009100200S00															UNK				

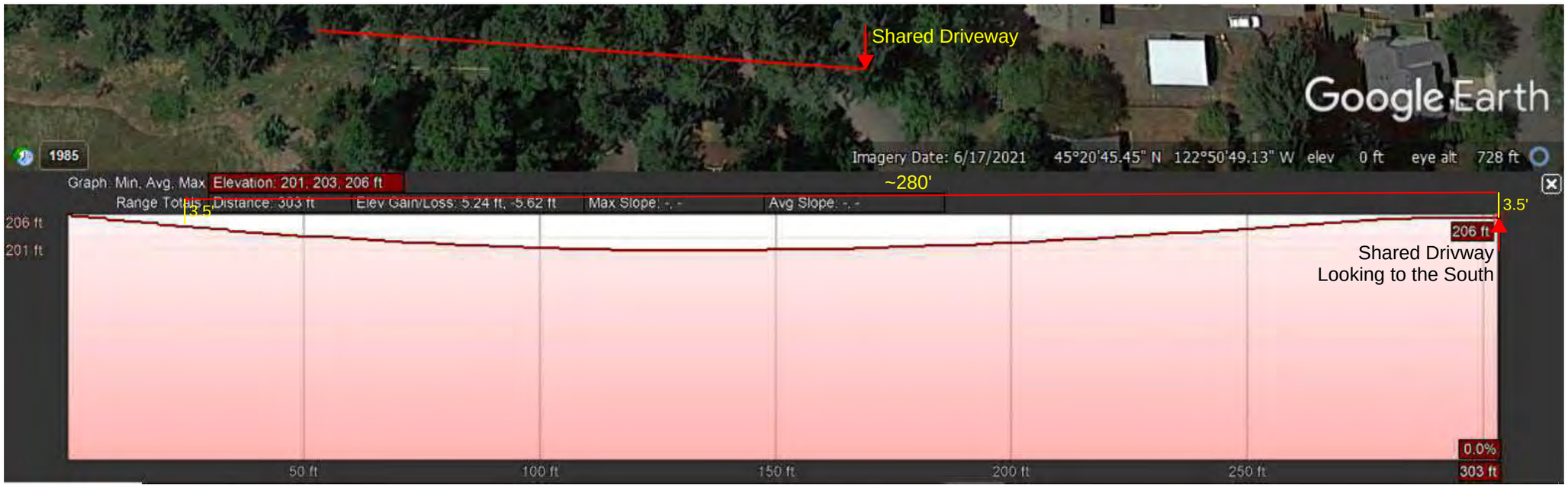
SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS / RES / LOC	PED	ERROR	ACT	EVENT	CAUSE
																		02	NONE 9	STRGHT										
																			N/A	S -N								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
05536	N	N	N	N	N	N	10/17/2018	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02
COUNTY							WE		MN	0		CN		STOP SIGN	N	DRY	ANGL		N/A	S -N								000		00
N							4P	PORTLAND UA	17.46			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	E -W								015		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
00282	N	N	N	N	N	N	01/16/2019	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY							WE		MN	0		CN		STOP SIGN	N	WET	ANGL		PRVTE	S -N								000		00
N							7P	PORTLAND UA	17.46			02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	INJB	53	F	OR-Y		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								015		00
																			PSNGR CAR		01	DRVR	INJC	30	M	OR-Y		028	000		02
																										OR<25					
01141	N	N	N	N	N	N	03/05/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY							TU		MN	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N							5P	PORTLAND UA	17.46			02	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	65	M	OR-Y		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								015		00
																			PSNGR CAR		01	DRVR	INJB	63	M	OR-Y		028	000		02
																										OR<25					
00125	N	N	N	N			01/08/2019	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY							TU		MN	0		CN		STOP SIGN	N	WET	ANGL		PRVTE	S -N								000		00
N							8A	PORTLAND UA	17.46			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000		00
N							45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								015		00
																			PSNGR CAR		01	DRVR	NONE	36	M	OR-Y		028	000		02
																										OR<25					
06521	N	N	N	N	N	N	12/10/2019	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT									079	03
COUNTY							TU		MN	0		CN		STOP SIGN	N	WET	ANGL		PRVTE	E -W								000		00
N							5P	PORTLAND UA	17.46			02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		021	000		03
N							45 20 32.9	-122 52 24.87			009100200S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	S -N								000		00
																			PSNGR CAR		01	DRVR	INJB	23	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	S -N								000		00
																			PSNGR CAR		02	PSNG	INJC	22	F			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R J S	M U G S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																			03	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	62	M	OR-Y OR<25		000	022 000	079	00 00
06925 COUNTY N N	N	N	N	N	N	N		12/27/2019 FR 7P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 02	CROSS 0	N STOP SIGN	N N N	CLR DRY DLIT	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	INJC	32	F	OR-Y OR<25		000	000 000	079	27,02,32 00 00
																			02	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	INJC	42	M	OR-Y OR<25		016,028,052	000 038	079	00 27,02,32
07481 COUNTY N N	N	N	N	N	N	N		11/25/2017 SA 8P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 04	CROSS 0	N STOP SIGN	N N N	CLD WET DARK	ANGL-OTH ANGL PDO	01	NONE 9 N/A PSNGR CAR	STRGHT W -E	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		02,32 00 00
																			02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00
02527 COUNTY N N	N	N	N	N	N	N		05/19/2018 SA 2P 45 20 32.9	WASHINGTON PORTLAND UA -122 52 24.87	2 14 MN 0 17.46 009100200S00			INTER CN 04	CROSS 0	N STOP SIGN	N N N	CLR DRY DAY	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	16	F	OR-Y OR<25		028,052	000 000		02,32 00 02,32
																			01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	02	PSNG	INJB	16	M			000	015 000		00 00
																			02	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	53	M	OTH-Y N-RES		000	000 000		00 00


SW Brookman Rd
SW Brookman Rd
Main Site Access
Google Earth
1985
Imagery Date: 6/17/2021 45°20'40.34" N 122°51'02.38" W elev 0 ft eye alt 4957 ft
Graph: Min, Avg, Max Elevation: 205, 209, 214 ft
Range Totals: Distance: 447 ft Elev Gain/Loss: 8.63 ft, -9 ft Max Slope: -, - Avg Slope: -, -
~445'
3.5'
214 ft
214 ft
205 ft
~200'
3.5'
Main Site Access
Looking to the East
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
300 ft
350 ft
400 ft
447 ft


SW Brookman Rd
SW Brookman Rd
Main Site Access
Google Earth
1985
Imagery Date: 6/17/2021 45°20'39.80" N 122°51'03.82" W elev 0 ft eye alt 4921 ft
Graph: Min, Avg, Max Elevation: 195, 203, 214 ft
Range Totals: Distance: 453 ft Elev Gain/Loss: 19 ft, -10.8 ft Max Slope: -, - Avg Slope: -, -
3.5'
214 ft
206 ft
202 ft
195 ft
3.5'
~450'
~305'
3.5'
Main Site Access
Looking to the West
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
300 ft
350 ft
400 ft
453 ft


Shared Driveway
Google Earth
1985
Imagery Date: 6/17/2021 45°20'46.77" N 122°50'44.23" W elev 0 ft eye alt 614 ft
Graph: Min, Avg, Max Elevation: 206, 214, 220 ft
Range Totals: Distance: 303 ft Elev Gain/Loss: 14.2 ft, -0.3 ft Max Slope: -, - Avg Slope: -, -
~280'
3.5'
220 ft
206 ft
3.5'
206 ft
Shared Driveway
Looking to the East
0.0%
0 ft
50 ft
100 ft
150 ft
200 ft
250 ft
303 ft


Shared Driveway
Google Earth
1985
Imagery Date: 6/17/2021 45°20'45.45" N 122°50'49.13" W elev 0 ft eye alt 728 ft
Graph: Min, Avg, Max Elevation: 201, 203, 206 ft
Range Totals: Distance: 303 ft Elev Gain/Loss: 5.24 ft, -5.62 ft Max Slope: -, - Avg Slope: -, -
~280'
3.5'
3.5'
206 ft
201 ft
206 ft
Shared Drivway
Looking to the South
0.0%
50 ft
100 ft
150 ft
200 ft
250 ft
303 ft

Left-Turn Lane Warrant Analysis

Project: Cedar Creek Gardens
Intersection: Main Access
Date: 11/4/2021
Scenario: Year 2024 Buildout Conditions - AM Peak Hour

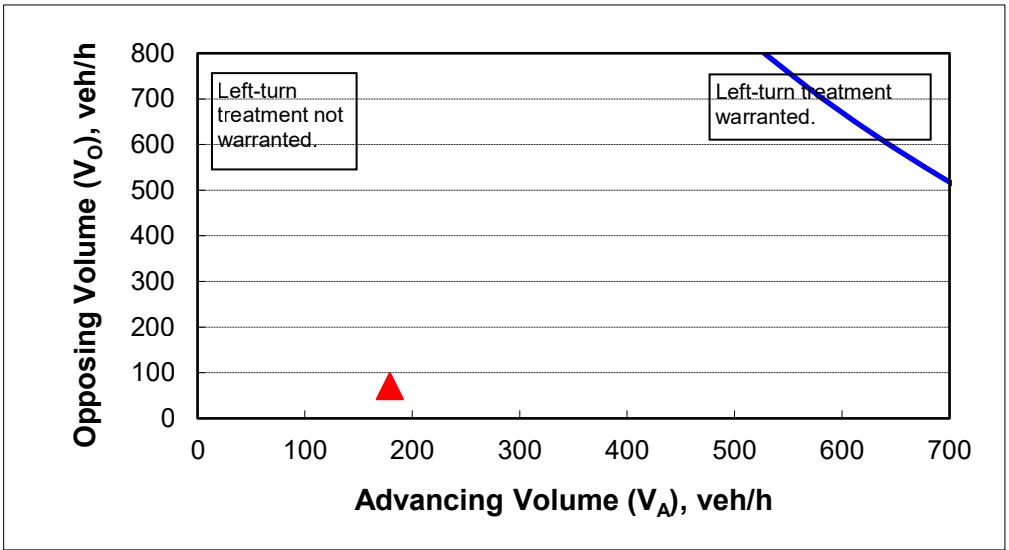
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Left-turns in advancing volume (V_A), veh/hr:	4
Advancing volume (V_A), veh/h:	179
Opposing volume (V_O), veh/h:	71

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1145
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Cedar Creek Gardens
Intersection: Main Access
Date: 11/4/2021
Scenario: Year 2024 Buildout Conditions - PM Peak Hour

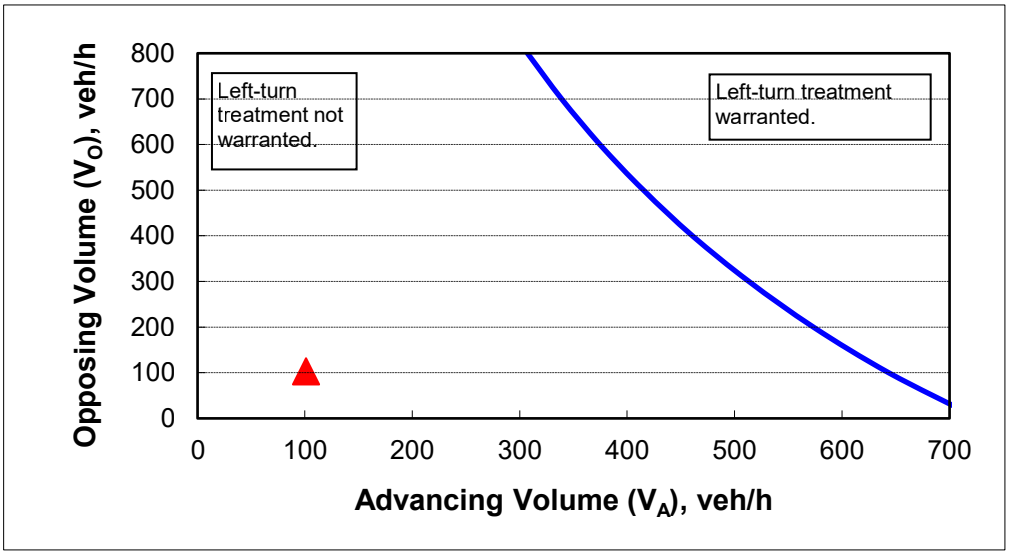
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Left-turns in advancing volume (V_A), veh/hr:	7
Advancing volume (V_A), veh/h:	101
Opposing volume (V_O), veh/h:	103

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	641
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Level of Service Definitions

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

- *Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.
- *Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.
- *Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.
- *Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.
- *Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.
- *Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

Level of Service Criteria
For Signalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

Level of Service Criteria
For Unsignalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

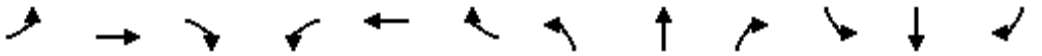
11/10/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	114	244	147	195	244	269	1644	114	141	800	16
Future Volume (vph)	22	114	244	147	195	244	269	1644	114	141	800	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3212		3367	3471	1553	3213	3312	1482
Flt Permitted	0.29	1.00	1.00	0.51	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	537	1845	1568	933	3212		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	120	257	155	205	257	283	1731	120	148	842	17
RTOR Reduction (vph)	0	0	216	0	153	0	0	0	49	0	0	8
Lane Group Flow (vph)	23	120	41	155	309	0	283	1731	71	148	842	9
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	21.5	18.2	18.2	27.1	21.0		13.5	62.4	62.4	8.2	57.1	57.1
Effective Green, g (s)	23.5	19.2	18.2	29.1	22.0		14.5	63.4	63.4	9.2	58.1	58.1
Actuated g/C Ratio	0.20	0.17	0.16	0.25	0.19		0.13	0.55	0.55	0.08	0.51	0.51
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	308	248	286	615		424	1915	856	257	1674	749
v/s Ratio Prot	0.01	0.07		c0.03	0.10		c0.08	c0.50		0.05	0.25	
v/s Ratio Perm	0.02		0.03	c0.10					0.05			0.01
v/c Ratio	0.15	0.39	0.16	0.54	0.50		0.67	0.90	0.08	0.58	0.50	0.01
Uniform Delay, d1	37.1	42.6	41.8	36.0	41.6		47.9	23.0	12.1	51.0	18.8	14.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8	0.3	2.1	0.6		4.0	6.5	0.0	3.1	0.2	0.0
Delay (s)	37.5	43.4	42.1	38.1	42.2		51.9	29.5	12.1	54.1	19.1	14.1
Level of Service	D	D	D	D	D		D	C	B	D	B	B
Approach Delay (s)		42.2			41.2			31.5			24.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	114.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	114	244	147	195	244	269	1644	114	141	800	16
Future Volume (veh/h)	22	114	244	147	195	244	269	1644	114	141	800	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	23	120	46	155	205	99	283	1731	67	148	842	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	190	198	153	245	320	149	386	2041	910	282	1868	833
Arrive On Green	0.04	0.11	0.10	0.07	0.14	0.13	0.11	0.58	0.58	0.09	0.56	0.56
Sat Flow, veh/h	1767	1856	1572	1767	2337	1086	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	23	120	46	155	153	151	283	1731	67	148	842	12
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1660	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	1.2	6.4	2.8	7.0	8.4	8.9	8.3	42.0	1.9	4.5	15.3	0.4
Cycle Q Clear(g_c), s	1.2	6.4	2.8	7.0	8.4	8.9	8.3	42.0	1.9	4.5	15.3	0.4
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	190	198	153	245	241	227	386	2041	910	282	1868	833
V/C Ratio(X)	0.12	0.61	0.30	0.63	0.63	0.67	0.73	0.85	0.07	0.53	0.45	0.01
Avail Cap(c_a), veh/h	244	306	244	245	291	274	528	2411	1075	285	2086	930
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	43.9	43.2	38.7	42.0	42.5	44.1	17.7	9.3	45.0	13.5	10.2
Incr Delay (d2), s/veh	0.3	3.0	1.1	5.3	3.2	4.6	3.4	2.6	0.0	1.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.0	1.1	3.8	3.8	3.9	3.5	15.1	0.6	1.8	5.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	46.9	44.3	44.0	45.2	47.1	47.5	20.3	9.4	46.8	13.7	10.2
LnGrp LOS	D	D	D	D	D	D	D	C	A	D	B	B
Approach Vol, veh/h		189			459			2081			1002	
Approach Delay, s/veh		45.3			45.4			23.7			18.5	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	64.1	11.0	15.0	15.7	61.3	7.9	18.1
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	70.0	6.0	16.0	15.0	63.0	6.0	16.0
Max Q Clear Time (g_c+I1), s	6.5	44.0	9.0	8.4	10.3	17.3	3.2	10.9
Green Ext Time (p_c), s	0.1	15.1	0.0	0.4	0.4	6.4	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	5	5	0	0	47	11	1925	92	22	1151	21
Future Vol, veh/h	27	5	5	0	0	47	11	1925	92	22	1151	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	275	-	-	260	-	240
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	28	5	5	0	0	49	11	2005	96	23	1199	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2270	3368	600	-	-	1051	1221	0	0	2101	0	0
Stage 1	1245	1245	-	-	-	-	-	-	-	-	-	-
Stage 2	1025	2123	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	-	-	7.08	4.18	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	-	-	3.39	2.24	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 20	7	427	0	0	212	556	-	-	241	-	-
Stage 1	174	231	-	0	0	-	-	-	-	-	-	-
Stage 2	239	82	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 14	6	427	-	-	212	556	-	-	241	-	-
Mov Cap-2 Maneuver	108	52	-	-	-	-	-	-	-	-	-	-
Stage 1	171	209	-	-	-	-	-	-	-	-	-	-
Stage 2	180	80	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	59.5	27	0.1	0.4
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	556	-	-	103	212	241	-	-
HCM Lane V/C Ratio	0.021	-	-	0.374	0.231	0.095	-	-
HCM Control Delay (s)	11.6	-	-	59.5	27	21.5	-	-
HCM Lane LOS	B	-	-	F	D	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.9	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

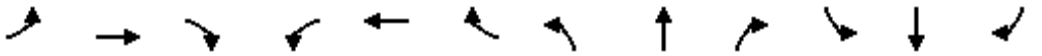
11/10/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	130	319	178	114	146	243	1051	135	281	1743	16
Future Volume (vph)	16	130	319	178	114	146	243	1051	135	281	1743	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3179		3400	3505	1568	3433	3539	1583
Flt Permitted	0.57	1.00	1.00	0.48	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1057	1863	1583	870	3179		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	138	339	189	121	155	259	1118	144	299	1854	17
RTOR Reduction (vph)	0	0	126	0	120	0	0	0	73	0	0	8
Lane Group Flow (vph)	17	138	213	189	156	0	259	1118	71	299	1854	9
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	24.8	22.5	22.5	32.2	26.2		9.0	59.2	59.2	13.9	64.1	64.1
Effective Green, g (s)	26.8	23.5	22.5	34.2	27.2		10.0	60.2	60.2	14.9	65.1	65.1
Actuated g/C Ratio	0.22	0.19	0.19	0.28	0.22		0.08	0.50	0.50	0.12	0.54	0.54
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	252	360	292	294	711		279	1735	776	420	1894	847
v/s Ratio Prot	0.00	0.07		c0.04	0.05		c0.08	0.32		c0.09	c0.52	
v/s Ratio Perm	0.01		0.13	c0.14					0.05			0.01
v/c Ratio	0.07	0.38	0.73	0.64	0.22		0.93	0.64	0.09	0.71	0.98	0.01
Uniform Delay, d1	37.3	42.7	46.7	38.1	38.5		55.4	22.8	16.2	51.3	27.6	13.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.7	8.8	4.8	0.2		35.0	0.8	0.1	5.6	15.8	0.0
Delay (s)	37.4	43.4	55.4	42.8	38.7		90.4	23.6	16.3	56.9	43.3	13.2
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		51.5			40.4			34.3			45.0	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	130	319	178	114	146	243	1051	135	281	1743	16
Future Volume (veh/h)	16	130	319	178	114	146	243	1051	135	281	1743	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	17	138	190	189	121	27	259	1118	85	299	1854	12
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	291	276	220	252	508	110	298	1902	848	390	2009	896
Arrive On Green	0.03	0.15	0.14	0.06	0.18	0.17	0.09	0.54	0.54	0.11	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	1753	2857	621	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	17	138	190	189	73	75	259	1118	85	299	1854	12
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1729	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	0.9	7.8	13.5	7.0	4.1	4.3	8.6	24.6	3.0	9.7	54.5	0.4
Cycle Q Clear(g_c), s	0.9	7.8	13.5	7.0	4.1	4.3	8.6	24.6	3.0	9.7	54.5	0.4
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	291	276	220	252	311	307	298	1902	848	390	2009	896
V/C Ratio(X)	0.06	0.50	0.86	0.75	0.23	0.24	0.87	0.59	0.10	0.77	0.92	0.01
Avail Cap(c_a), veh/h	345	326	262	252	311	307	298	1902	848	481	2072	924
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	45.1	48.4	43.1	40.5	40.8	51.8	17.8	12.9	49.5	22.7	10.9
Incr Delay (d2), s/veh	0.1	1.4	21.8	11.9	0.4	0.4	22.8	0.5	0.1	5.8	7.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.7	6.6	2.7	1.8	1.9	4.5	9.2	1.1	4.4	22.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3	46.5	70.3	54.9	40.9	41.2	74.6	18.3	12.9	55.3	30.1	10.9
LnGrp LOS	D	D	E	D	D	D	E	B	B	E	C	B
Approach Vol, veh/h		345			337			1462			2165	
Approach Delay, s/veh		59.2			48.8			28.0			33.4	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	66.0	11.0	20.9	14.0	69.0	7.5	24.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	15.0	60.0	6.0	19.0	9.0	66.0	6.0	19.0
Max Q Clear Time (g_c+I1), s	11.7	26.6	9.0	15.5	10.6	56.5	2.9	6.3
Green Ext Time (p_c), s	0.3	9.3	0.0	0.5	0.0	7.5	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	34.9
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	5	11	0	0	32	16	1379	49	27	2155	48
Future Vol, veh/h	22	5	11	0	0	32	16	1379	49	27	2155	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	275	-	-	260	-	240
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	23	5	11	0	0	33	17	1436	51	28	2245	50

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3053	3822	1123	-	-	744	2295	0	0	1487	0	0
Stage 1	2301	2301	-	-	-	-	-	-	-	-	-	-
Stage 2	752	1521	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	-	-	6.92	4.16	-	-	4.14	-	-
Critical Hdwy Stg 1	6.56	5.56	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	-	-	3.31	2.23	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 5	~ 4	198	0	0	359	213	-	-	448	-	-
Stage 1	39	71	-	0	0	-	-	-	-	-	-	-
Stage 2	366	178	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 4	~ 3	198	-	-	359	213	-	-	448	-	-
Mov Cap-2 Maneuver	34	55	-	-	-	-	-	-	-	-	-	-
Stage 1	36	67	-	-	-	-	-	-	-	-	-	-
Stage 2	306	164	-	-	-	-	-	-	-	-	-	-

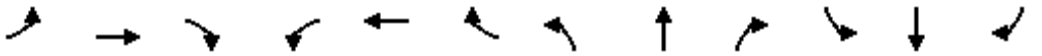
Approach	EB	WB	NB	SB
HCM Control Delay, s	212	16.1	0.3	0.2
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	213	-	-	48	359	448	-	-
HCM Lane V/C Ratio	0.078	-	-	0.825	0.093	0.063	-	-
HCM Control Delay (s)	23.3	-	-	212	16.1	13.6	-	-
HCM Lane LOS	C	-	-	F	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	3.4	0.3	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

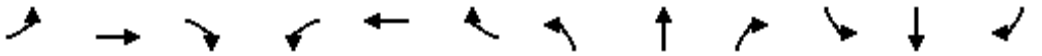


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	255	290	162	402	237	383	1697	121	192	764	195
Future Volume (vph)	133	255	290	162	402	237	383	1697	121	192	764	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3310		3367	3471	1553	3213	3312	1482
Flt Permitted	0.18	1.00	1.00	0.24	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	325	1845	1568	441	3310		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	268	305	171	423	249	403	1786	127	202	804	205
RTOR Reduction (vph)	0	0	168	0	70	0	0	0	50	0	0	110
Lane Group Flow (vph)	140	268	137	171	602	0	403	1786	77	202	804	95
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	27.7	21.7	21.7	29.7	22.7		18.2	64.1	64.1	8.0	53.9	53.9
Effective Green, g (s)	29.7	22.7	21.7	31.7	23.7		19.2	65.1	65.1	9.0	54.9	54.9
Actuated g/C Ratio	0.25	0.19	0.18	0.26	0.20		0.16	0.54	0.54	0.07	0.45	0.45
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	346	281	202	649		535	1870	836	239	1505	673
v/s Ratio Prot	0.05	0.15		c0.06	c0.18		c0.12	c0.51		0.06	0.24	
v/s Ratio Perm	0.16		0.09	0.17					0.05			0.06
v/c Ratio	0.86	0.77	0.49	0.85	0.93		0.75	0.96	0.09	0.85	0.53	0.14
Uniform Delay, d1	40.7	46.6	44.5	39.6	47.7		48.5	26.5	13.5	55.2	23.7	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	10.3	1.3	26.4	19.4		5.9	11.9	0.0	23.0	0.4	0.1
Delay (s)	75.6	57.0	45.9	66.0	67.1		54.5	38.3	13.6	78.2	24.1	19.3
Level of Service	E	E	D	E	E		D	D	B	E	C	B
Approach Delay (s)		55.9			66.9			39.8			32.3	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	255	290	162	402	237	383	1697	121	192	764	195
Future Volume (veh/h)	133	255	290	162	402	237	383	1697	121	192	764	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	140	268	94	171	423	91	403	1786	74	202	804	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	197	313	252	211	512	109	496	1922	857	251	1614	720
Arrive On Green	0.06	0.17	0.16	0.07	0.18	0.17	0.15	0.55	0.55	0.08	0.48	0.48
Sat Flow, veh/h	1767	1856	1572	1767	2890	617	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	140	268	94	171	257	257	403	1786	74	202	804	200
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1745	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	7.0	16.4	6.3	8.0	16.4	16.7	13.4	55.0	2.6	7.1	19.2	9.4
Cycle Q Clear(g_c), s	7.0	16.4	6.3	8.0	16.4	16.7	13.4	55.0	2.6	7.1	19.2	9.4
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	313	252	211	312	309	496	1922	857	251	1614	720
V/C Ratio(X)	0.71	0.86	0.37	0.81	0.82	0.83	0.81	0.93	0.09	0.81	0.50	0.28
Avail Cap(c_a), veh/h	197	333	269	211	331	328	610	1971	879	251	1614	720
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	47.3	43.9	41.5	46.4	46.7	48.5	24.3	12.5	53.2	20.8	18.2
Incr Delay (d2), s/veh	11.1	18.6	0.9	20.8	14.6	15.9	6.8	8.3	0.0	17.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	9.1	2.5	2.3	8.4	8.5	6.0	22.5	0.9	3.4	7.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	65.9	44.9	62.4	61.0	62.6	55.3	32.6	12.5	70.4	21.0	18.4
LnGrp LOS	D	E	D	E	E	E	E	C	B	E	C	B
Approach Vol, veh/h		502			685			2263			1206	
Approach Delay, s/veh		58.0			62.0			36.0			28.8	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	68.4	12.0	23.7	21.1	60.3	11.0	24.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	65.0	7.0	20.0	20.0	53.0	6.0	21.0
Max Q Clear Time (g_c+I1), s	9.1	57.0	10.0	18.4	15.4	21.2	9.0	18.7
Green Ext Time (p_c), s	0.0	6.3	0.0	0.3	0.6	6.6	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	40.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	37	0	0	135	0	2030	104	0	1206	30
Future Vol, veh/h	0	0	37	0	0	135	0	2030	104	0	1206	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	0	0	39	0	0	141	0	2115	108	0	1256	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	628	-	-	1112	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.08	-	-	7.08	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.39	-	-	3.39	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	409	0	0	192	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	409	-	-	192	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	62.6	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	409	192	-	-
HCM Lane V/C Ratio	-	-	0.094	0.732	-	-
HCM Control Delay (s)	-	-	14.7	62.6	-	-
HCM Lane LOS	-	-	B	F	-	-
HCM 95th %tile Q(veh)	-	-	0.3	4.7	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	121	50	18	52	77
Future Vol, veh/h	27	121	50	18	52	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	40	178	74	26	76	113

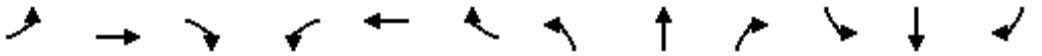
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	100	0	-	0	345	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1499	-	-	-	656	977
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1499	-	-	-	636	977
Mov Cap-2 Maneuver	-	-	-	-	636	-
Stage 1	-	-	-	-	913	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1499	-	-	-	803
HCM Lane V/C Ratio	0.026	-	-	-	0.236
HCM Control Delay (s)	7.5	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

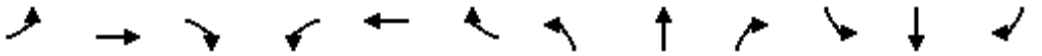


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	177	346	192	155	154	285	1107	143	423	1755	46
Future Volume (vph)	46	177	346	192	155	154	285	1107	143	423	1755	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3212		3400	3505	1568	3433	3539	1583
Flt Permitted	0.45	1.00	1.00	0.36	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	831	1863	1583	655	3212		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	188	368	204	165	164	303	1178	152	450	1867	49
RTOR Reduction (vph)	0	0	138	0	132	0	0	0	84	0	0	23
Lane Group Flow (vph)	49	188	230	204	197	0	303	1178	68	450	1867	26
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.7	20.2	20.2	31.7	22.7		10.0	54.2	54.2	19.9	64.1	64.1
Effective Green, g (s)	28.7	21.2	20.2	33.7	23.7		11.0	55.2	55.2	20.9	65.1	65.1
Actuated g/C Ratio	0.23	0.17	0.16	0.27	0.19		0.09	0.45	0.45	0.17	0.53	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	250	320	259	266	617		303	1569	701	581	1868	835
v/s Ratio Prot	0.01	0.10		c0.06	0.06		c0.09	0.34		0.13	c0.53	
v/s Ratio Perm	0.03		0.15	c0.15					0.04			0.02
v/c Ratio	0.20	0.59	0.89	0.77	0.32		1.00	0.75	0.10	0.77	1.00	0.03
Uniform Delay, d1	37.4	47.0	50.4	39.0	42.9		56.1	28.3	19.7	48.9	29.1	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.7	28.5	12.4	0.3		51.7	2.1	0.1	6.4	20.5	0.0
Delay (s)	37.8	49.8	78.9	51.4	43.2		107.9	30.4	19.7	55.3	49.6	14.0
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		66.5			46.3			43.8			50.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	177	346	192	155	154	285	1107	143	423	1755	46
Future Volume (veh/h)	46	177	346	192	155	154	285	1107	143	423	1755	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	49	188	219	204	165	36	303	1178	93	450	1867	44
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	305	281	225	259	530	113	315	1677	748	544	1923	858
Arrive On Green	0.05	0.15	0.14	0.08	0.18	0.18	0.09	0.48	0.48	0.16	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1753	2868	611	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	49	188	219	204	99	102	303	1178	93	450	1867	44
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1731	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	2.7	11.4	16.5	10.0	5.9	6.1	10.6	31.5	4.0	15.1	60.9	1.6
Cycle Q Clear(g_c), s	2.7	11.4	16.5	10.0	5.9	6.1	10.6	31.5	4.0	15.1	60.9	1.6
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	281	225	259	323	320	315	1677	748	544	1923	858
V/C Ratio(X)	0.16	0.67	0.97	0.79	0.31	0.32	0.96	0.70	0.12	0.83	0.97	0.05
Avail Cap(c_a), veh/h	367	281	225	259	323	320	315	1677	748	663	1927	859
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	48.1	51.2	41.2	42.2	42.5	54.2	24.8	17.5	48.9	26.6	13.0
Incr Delay (d2), s/veh	0.2	6.0	52.6	14.7	0.5	0.6	40.8	1.3	0.1	7.2	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.7	9.7	2.2	2.6	2.7	6.2	12.6	1.4	6.9	26.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	54.1	103.8	55.9	42.7	43.0	95.0	26.1	17.6	56.1	40.8	13.0
LnGrp LOS	D	D	F	E	D	D	F	C	B	E	D	B
Approach Vol, veh/h		456			405			1574			2361	
Approach Delay, s/veh		76.5			49.4			38.9			43.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.9	61.0	14.0	22.0	15.0	68.9	9.8	26.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	22.0	52.0	9.0	17.0	10.0	64.0	9.0	17.0
Max Q Clear Time (g_c+I1), s	17.1	33.5	12.0	18.5	12.6	62.9	4.7	8.1
Green Ext Time (p_c), s	0.7	8.0	0.0	0.0	0.0	1.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	42	0	0	81	0	1451	72	0	2229	60
Future Vol, veh/h	0	0	42	0	0	81	0	1451	72	0	2229	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	0	0	44	0	0	84	0	1511	75	0	2322	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1161	-	-	793	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.96	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.33	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	187	0	0	334	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	187	-	-	334	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	19.4	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	187	334	-	-
HCM Lane V/C Ratio	-	-	0.234	0.253	-	-
HCM Control Delay (s)	-	-	30	19.4	-	-
HCM Lane LOS	-	-	D	C	-	-
HCM 95th %tile Q(veh)	-	-	0.9	1	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	85	59	43	54	34	48
Future Vol, veh/h	85	59	43	54	34	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	123	86	62	78	49	70

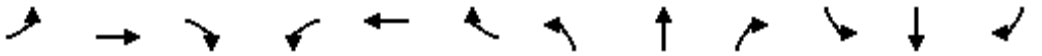
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	140	0	-	0	433	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1443	-	-	-	584	960
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	731	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1443	-	-	-	532	960
Mov Cap-2 Maneuver	-	-	-	-	532	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	731	-

Approach	EB	WB	SB
HCM Control Delay, s	4.6	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1443	-	-	-	720
HCM Lane V/C Ratio	0.085	-	-	-	0.165
HCM Control Delay (s)	7.7	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

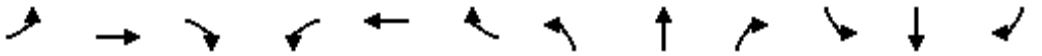


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	255	290	165	403	239	383	1707	121	196	764	195
Future Volume (vph)	133	255	290	165	403	239	383	1707	121	196	764	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	3309		3367	3471	1553	3213	3312	1482
Flt Permitted	0.18	1.00	1.00	0.22	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	337	1845	1568	413	3309		3367	3471	1553	3213	3312	1482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	268	305	174	424	252	403	1797	127	206	804	205
RTOR Reduction (vph)	0	0	168	0	71	0	0	0	50	0	0	109
Lane Group Flow (vph)	140	268	137	174	605	0	403	1797	77	206	804	96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	9%	9%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.9	20.9	20.9	28.9	21.9		18.2	64.7	64.7	8.0	54.5	54.5
Effective Green, g (s)	28.9	21.9	20.9	30.9	22.9		19.2	65.7	65.7	9.0	55.5	55.5
Actuated g/C Ratio	0.24	0.18	0.17	0.26	0.19		0.16	0.54	0.54	0.07	0.46	0.46
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	335	271	194	628		536	1890	846	239	1524	682
v/s Ratio Prot	0.05	0.15		c0.06	c0.18		c0.12	c0.52		0.06	0.24	
v/s Ratio Perm	0.16		0.09	0.17					0.05			0.06
v/c Ratio	0.86	0.80	0.51	0.90	0.96		0.75	0.95	0.09	0.86	0.53	0.14
Uniform Delay, d1	41.1	47.3	45.2	40.5	48.4		48.4	25.9	13.2	55.2	23.2	18.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	12.8	1.5	37.0	26.8		5.9	11.2	0.0	25.8	0.3	0.1
Delay (s)	76.0	60.0	46.7	77.5	75.2		54.3	37.2	13.2	81.0	23.5	18.9
Level of Service	E	E	D	E	E		D	D	B	F	C	B
Approach Delay (s)		57.5			75.7			38.8			32.5	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	255	290	165	403	239	383	1707	121	196	764	195
Future Volume (veh/h)	133	255	290	165	403	239	383	1707	121	196	764	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1767	1767	1767
Adj Flow Rate, veh/h	140	268	94	174	424	94	403	1797	74	206	804	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	9	9	9
Cap, veh/h	193	309	249	207	504	111	495	1936	863	249	1625	725
Arrive On Green	0.06	0.17	0.16	0.07	0.18	0.17	0.15	0.55	0.55	0.08	0.48	0.48
Sat Flow, veh/h	1767	1856	1572	1767	2873	632	3401	3497	1560	3264	3357	1497
Grp Volume(v), veh/h	140	268	94	174	259	259	403	1797	74	206	804	200
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1763	1742	1700	1749	1560	1632	1678	1497
Q Serve(g_s), s	7.0	16.6	6.3	8.0	16.7	17.0	13.5	55.7	2.6	7.3	19.2	9.4
Cycle Q Clear(g_c), s	7.0	16.6	6.3	8.0	16.7	17.0	13.5	55.7	2.6	7.3	19.2	9.4
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	193	309	249	207	309	305	495	1936	863	249	1625	725
V/C Ratio(X)	0.73	0.87	0.38	0.84	0.84	0.85	0.81	0.93	0.09	0.83	0.49	0.28
Avail Cap(c_a), veh/h	193	315	253	207	314	310	605	1987	886	249	1625	725
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	47.9	44.4	42.4	47.0	47.3	48.9	24.2	12.3	53.7	20.6	18.1
Incr Delay (d2), s/veh	12.7	21.3	0.9	25.2	17.6	19.2	7.0	8.2	0.0	20.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	9.4	0.1	2.7	8.8	8.9	6.1	22.6	0.9	3.6	7.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	69.2	45.4	67.6	64.6	66.5	55.9	32.4	12.4	73.8	20.9	18.3
LnGrp LOS	D	E	D	E	E	E	E	C	B	E	C	B
Approach Vol, veh/h		502			692			2274			1210	
Approach Delay, s/veh		60.5			66.1			35.9			29.4	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	69.3	12.0	23.7	21.2	61.1	11.0	24.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	8.0	66.0	7.0	19.0	20.0	54.0	6.0	20.0
Max Q Clear Time (g_c+I1), s	9.3	57.7	10.0	18.6	15.5	21.2	9.0	19.0
Green Ext Time (p_c), s	0.0	6.6	0.0	0.1	0.6	6.6	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	41.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	37	0	0	145	0	2030	105	0	1206	30
Future Vol, veh/h	0	0	37	0	0	145	0	2030	105	0	1206	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	4	4	4	7	7	7
Mvmt Flow	0	0	39	0	0	151	0	2115	109	0	1256	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	628	-	-	1112	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.08	-	-	7.08	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.39	-	-	3.39	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	409	0	0	192	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	409	-	-	192	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	70.3	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	409	192	-	-
HCM Lane V/C Ratio	-	-	0.094	0.787	-	-
HCM Control Delay (s)	-	-	14.7	70.3	-	-
HCM Lane LOS	-	-	B	F	-	-
HCM 95th %tile Q(veh)	-	-	0.3	5.4	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	125	61	19	54	80
Future Vol, veh/h	28	125	61	19	54	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	41	184	90	28	79	118

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	118	0	-	0	370	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1476	-	-	-	634	956
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1476	-	-	-	614	956
Mov Cap-2 Maneuver	-	-	-	-	614	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1476	-	-	-	781
HCM Lane V/C Ratio	0.028	-	-	-	0.252
HCM Control Delay (s)	7.5	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	175	69	2	6	11
Future Vol, veh/h	4	175	69	2	6	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	1	1	8	8	0	0
Mvmt Flow	6	257	101	3	9	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	104	0	-	0	372	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	269	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1494	-	-	-	633	957
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	781	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1494	-	-	-	630	957
Mov Cap-2 Maneuver	-	-	-	-	630	-
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	781	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1494	-	-	-	809
HCM Lane V/C Ratio	0.004	-	-	-	0.031
HCM Control Delay (s)	7.4	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	181	71	0
Future Vol, veh/h	2	0	0	181	71	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	1	1	8	8
Mvmt Flow	3	0	0	266	104	0

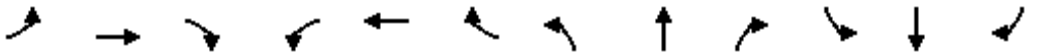
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	370	104	104	0	-	0
Stage 1	104	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	630	951	1494	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	630	951	1494	-	-	-
Mov Cap-2 Maneuver	630	-	-	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	779	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	630	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	10.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM Signalized Intersection Capacity Analysis
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021

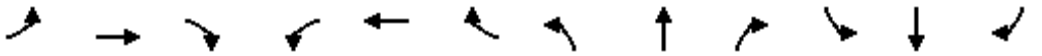


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	178	346	193	156	155	285	1114	143	429	1755	46
Future Volume (vph)	46	178	346	193	156	155	285	1114	143	429	1755	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1736	3212		3400	3505	1568	3433	3539	1583
Flt Permitted	0.44	1.00	1.00	0.36	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	826	1863	1583	651	3212		3400	3505	1568	3433	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	189	368	205	166	165	303	1185	152	456	1867	49
RTOR Reduction (vph)	0	0	138	0	133	0	0	0	84	0	0	23
Lane Group Flow (vph)	49	189	230	205	198	0	303	1185	68	456	1867	26
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.7	20.2	20.2	31.7	22.7		10.0	54.1	54.1	20.0	64.1	64.1
Effective Green, g (s)	28.7	21.2	20.2	33.7	23.7		11.0	55.1	55.1	21.0	65.1	65.1
Actuated g/C Ratio	0.23	0.17	0.16	0.27	0.19		0.09	0.45	0.45	0.17	0.53	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	249	320	259	265	617		303	1566	700	584	1868	835
v/s Ratio Prot	0.01	0.10		c0.06	0.06		c0.09	0.34		0.13	c0.53	
v/s Ratio Perm	0.03		0.15	c0.15					0.04			0.02
v/c Ratio	0.20	0.59	0.89	0.77	0.32		1.00	0.76	0.10	0.78	1.00	0.03
Uniform Delay, d1	37.4	47.1	50.4	39.1	42.9		56.1	28.5	19.7	48.9	29.1	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.9	28.5	13.1	0.3		51.7	2.1	0.1	6.7	20.5	0.0
Delay (s)	37.8	50.0	78.9	52.2	43.2		107.9	30.6	19.8	55.7	49.6	14.0
Level of Service	D	D	E	D	D		F	C	B	E	D	B
Approach Delay (s)		66.6			46.6			43.9			50.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 99W & SW Elwert/SW Sunset

11/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	178	346	193	156	155	285	1114	143	429	1755	46
Future Volume (veh/h)	46	178	346	193	156	155	285	1114	143	429	1755	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	49	189	219	205	166	37	303	1185	93	456	1867	44
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	2	2	2
Cap, veh/h	304	281	225	259	528	115	315	1671	745	549	1923	858
Arrive On Green	0.05	0.15	0.14	0.08	0.18	0.18	0.09	0.47	0.47	0.16	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1753	2856	622	3428	3526	1572	3456	3554	1585
Grp Volume(v), veh/h	49	189	219	205	100	103	303	1185	93	456	1867	44
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1753	1749	1729	1714	1763	1572	1728	1777	1585
Q Serve(g_s), s	2.7	11.5	16.5	10.0	5.9	6.2	10.6	31.9	4.0	15.3	60.9	1.6
Cycle Q Clear(g_c), s	2.7	11.5	16.5	10.0	5.9	6.2	10.6	31.9	4.0	15.3	60.9	1.6
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	304	281	225	259	323	320	315	1671	745	549	1923	858
V/C Ratio(X)	0.16	0.67	0.97	0.79	0.31	0.32	0.96	0.71	0.12	0.83	0.97	0.05
Avail Cap(c_a), veh/h	366	281	225	259	323	320	315	1671	745	663	1927	859
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	48.2	51.2	41.3	42.2	42.5	54.2	25.0	17.6	48.8	26.6	13.0
Incr Delay (d2), s/veh	0.2	6.2	52.6	15.3	0.5	0.6	40.8	1.4	0.1	7.4	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.8	9.7	2.3	2.6	2.7	6.2	12.8	1.4	7.0	26.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	54.3	103.8	56.6	42.8	43.1	95.0	26.4	17.7	56.3	40.8	13.0
LnGrp LOS	D	D	F	E	D	D	F	C	B	E	D	B
Approach Vol, veh/h		457			408			1581			2367	
Approach Delay, s/veh		76.5			49.8			39.0			43.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.1	60.8	14.0	22.0	15.0	68.9	9.8	26.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	22.0	52.0	9.0	17.0	10.0	64.0	9.0	17.0
Max Q Clear Time (g_c+I1), s	17.3	33.9	12.0	18.5	12.6	62.9	4.7	8.2
Green Ext Time (p_c), s	0.7	7.9	0.0	0.0	0.0	1.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	45.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	42	0	0	88	0	1451	74	0	2229	60
Future Vol, veh/h	0	0	42	0	0	88	0	1451	74	0	2229	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	240
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	0	0	44	0	0	92	0	1511	77	0	2322	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1161	-	-	794	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.96	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.33	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	187	0	0	333	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	187	-	-	333	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	19.9	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	187	333	-	-
HCM Lane V/C Ratio	-	-	0.234	0.275	-	-
HCM Control Delay (s)	-	-	30	19.9	-	-
HCM Lane LOS	-	-	D	C	-	-
HCM 95th %tile Q(veh)	-	-	0.9	1.1	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	87	66	50	55	35	50
Future Vol, veh/h	87	66	50	55	35	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	126	96	72	80	51	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	460	112
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1429	-	-	-	563	947
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1429	-	-	-	511	947
Mov Cap-2 Maneuver	-	-	-	-	511	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	SB
HCM Control Delay, s	4.4	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	701
HCM Lane V/C Ratio	0.088	-	-	-	0.176
HCM Control Delay (s)	7.8	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	94	98	5	4	7
Future Vol, veh/h	7	94	98	5	4	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	10	136	142	7	6	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	149	0	-	0	302	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1432	-	-	-	694	906
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	877	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1432	-	-	-	688	906
Mov Cap-2 Maneuver	-	-	-	-	688	-
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	877	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1432	-	-	-	812
HCM Lane V/C Ratio	0.007	-	-	-	0.02
HCM Control Delay (s)	7.5	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	98	103	1
Future Vol, veh/h	1	0	0	98	103	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	2	2	1	1	8	8
Mvmt Flow	1	0	0	144	151	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	296	152	152	0	-	0
Stage 1	152	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	695	894	1435	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	883	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	695	894	1435	-	-	-
Mov Cap-2 Maneuver	695	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1435	-	695	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

PIONEER DESIGN GROUP, INC.
CIVIL LAND USE PLANNING SURVEY
P 503.643.8286 F 844.715.4743 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

Exhibit I – Sheet P7.0, Future Conceptual Connectivity Plan

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Project	CEDAR CREEK GARDENS		
No.	285-021		
Type	PLANNING		
Sheet			

No.	Date	Revision	By

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

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CONCEPTUAL FUTURE CONNECTIVITY PLAN

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

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Exhibit A27

WASHINGTON COUNTY
LAND USE AND TRANSPORTATION
SURVEYOR'S OFFICE

SUBDIVISION PLAT NAMING

I request that the Washington County Surveyor's Office reserve the following subdivision name:

PROPOSED NAME OF SUBDIVISION:	Cedar Creek Gardens
MAP AND TAX LOT NUMBER:	3S106 - 102/107
CITY JURISDICTION (Which City?) or COUNTY JURISDICTION:	Sherwood
SURVEYOR'S NAME: PLS NUMBER: COMPANY NAME:	Michael H Harris 57863 Pioneer Design Group
OWNER'S NAME:	Westwood Homes

I understand that if the name is not used within five years, it will be automatically canceled.

Name of person reserving name: Michael Harris
Company name: Pioneer Design Group
Address: 9020 SW Washington Sq. Rd Ste. 170 Portland, OR 97223
Telephone number: 503-643-8286
E-Mail: mharris@pd-grp.com

PA SHADOW 11-18-2021 Name added to SID ✓
Name approved *Date*
Washington County Surveyor's Office

155 North First Avenue, Suite 350, MS 15, Hillsboro, OR 97124 ***Phone: 503-846-8723***

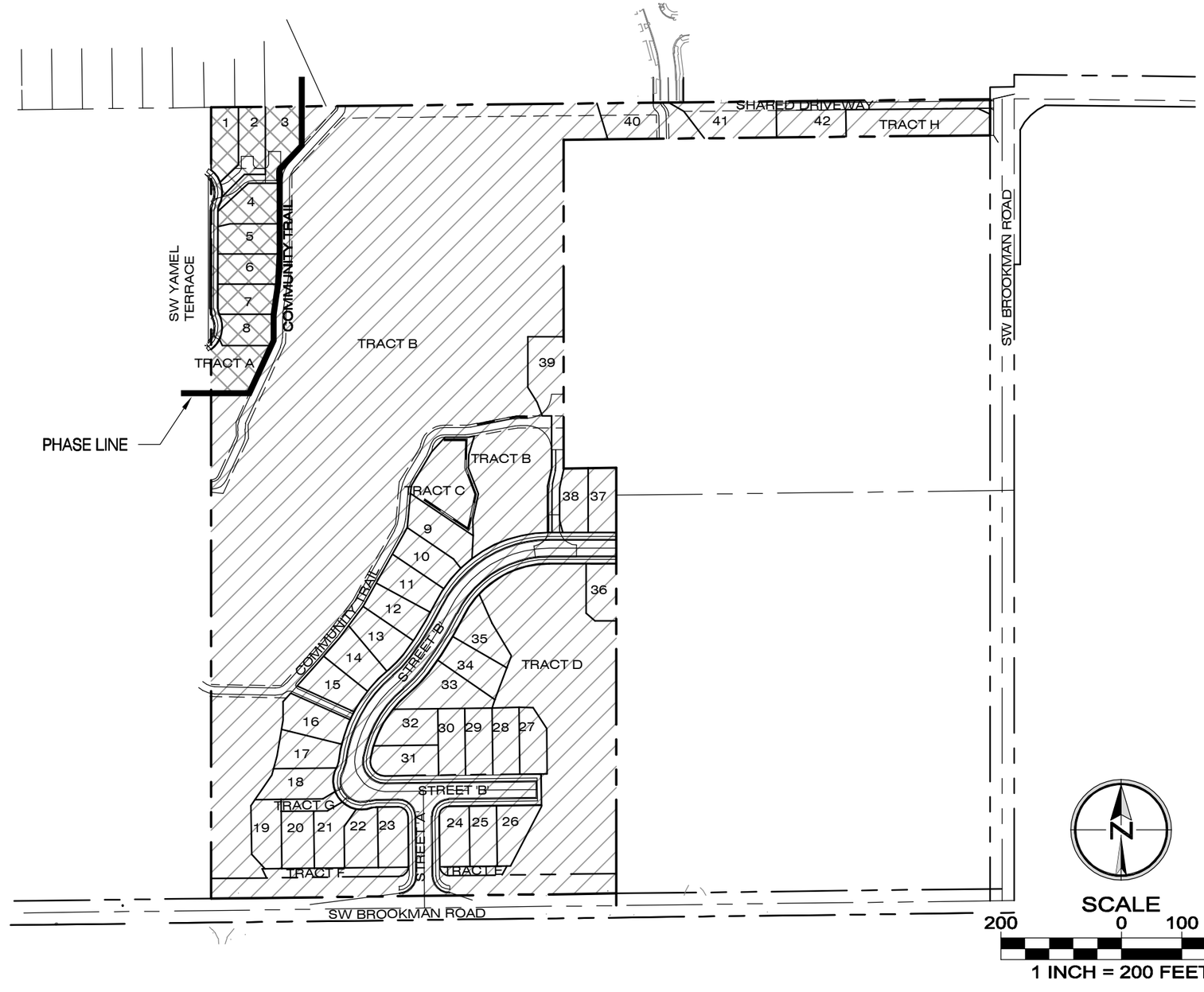
PROPOSED PHASE EXHIBIT

CEDAR CREEK GARDENS

LEGEND

PHASE 1

PHASE 2



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Designed by	MLS	Date	11/2021
Drawn by	CFS	Date	11/2021
Reviewed by	MLS	Date	11/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

PHASE EXHIBIT.DWG

Project
CEDAR CREEK GARDENS

No.
285-021

Type
PLANNING

Sheet
1 of 1

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CEDAR CREEK GARDENS

A 41 LOT SUBDIVISION ON TAX LOT 102 & 107 TAX MAP 3S106
16871 & 17033 SW BROOKMAN ROAD, SHERWOOD, OREGON, 97140

APPLICANT

WESTWOOD HOMES LLC
12700 NW CORNELL ROAD
PORTLAND, OR 97229
PHONE: (503) 330-2215

OWNER

WAYNE AND LINDA CHRONISTER (TAX LOT 107)
PO BOX 1474
SHERWOOD, OR 97140

CHARLES AND LOUISE BISSETT (TAX LOT 102)
16871 SW BROOKMAN ROAD
SHERWOOD, OR 97140

PLANNING/ENGINEERING/SURVEYING

PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQ RD., SUITE 170
PORTLAND, OR 97223
PHONE: (503) 643-8286
CONTACT: MATT SPRAGUE

SITE INFORMATION

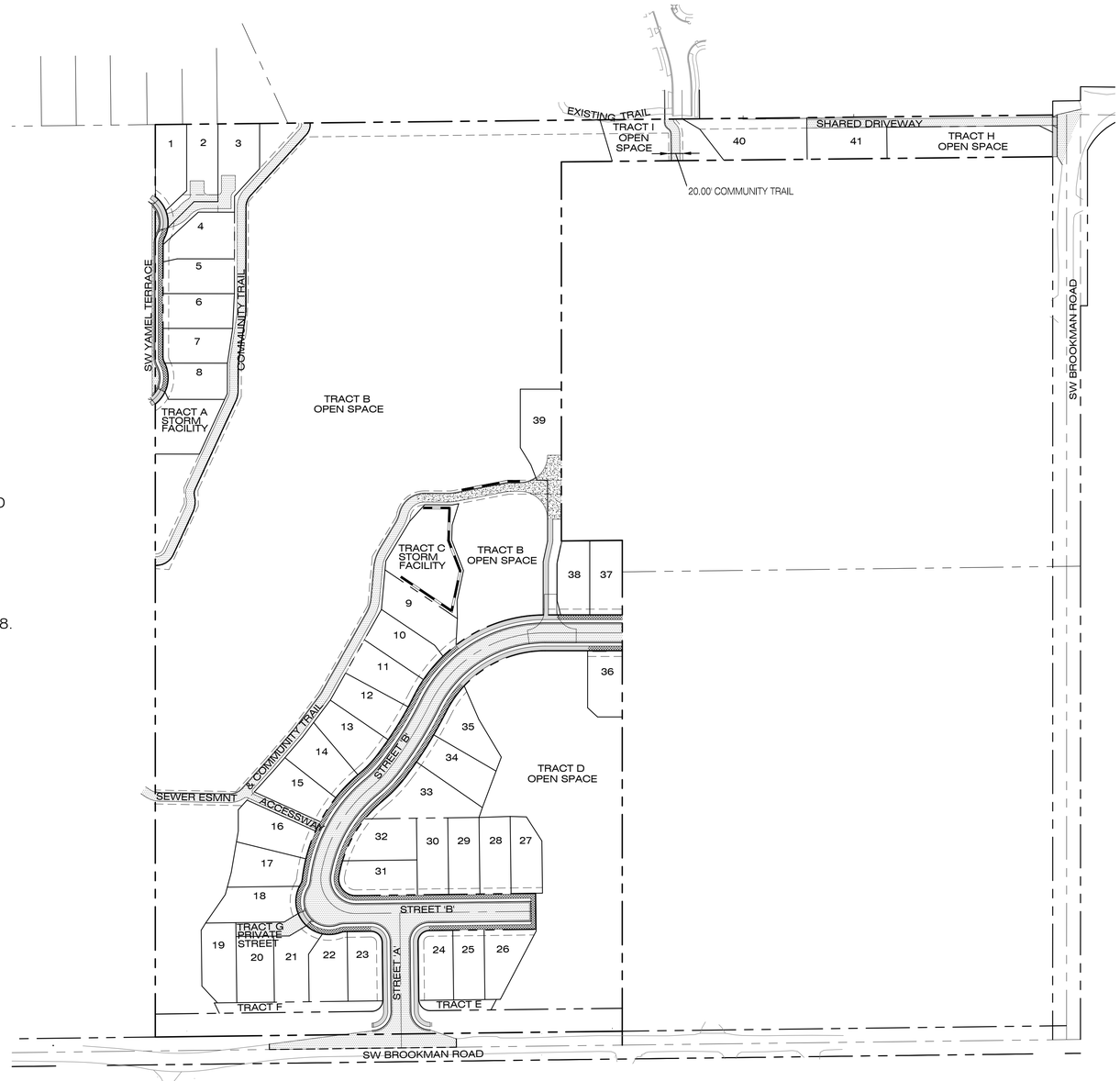
TAX MAP:	3S106
TAX LOT:	102 & 107
SITE ADDRESS:	16871 & 17033 SW BROOKMAN ROAD SHERWOOD, OREGON 97140
SITE SIZE:	19.99 ACRES
ZONING:	MDRL

VERTICAL DATUM

BENCHMARK: WASHINGTON COUNTY BENCHMARK NO. 118.

DESCRIPTION: A 3" BRASS DISK INSCRIBED "WASH. CO. BM 118" SET CONCRETE FILLED WITH METAL, NORTH SIDE OF BROOKMAN ROAD ON THE EXTENDED CENTERLINE OF OBERST ROAD

ELEVATION: 194.775' NGVD 29



SITE MAP
SCALE: 1"=100'

VICINITY MAP
N.T.S

SHEET INDEX

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COVER SHEET

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P1.0covr.dwg

No.	Date	Revision	By

Project CEDAR CREEK GARDENS
No. 285-021
Type PLANNING
Sheet **P1.0**

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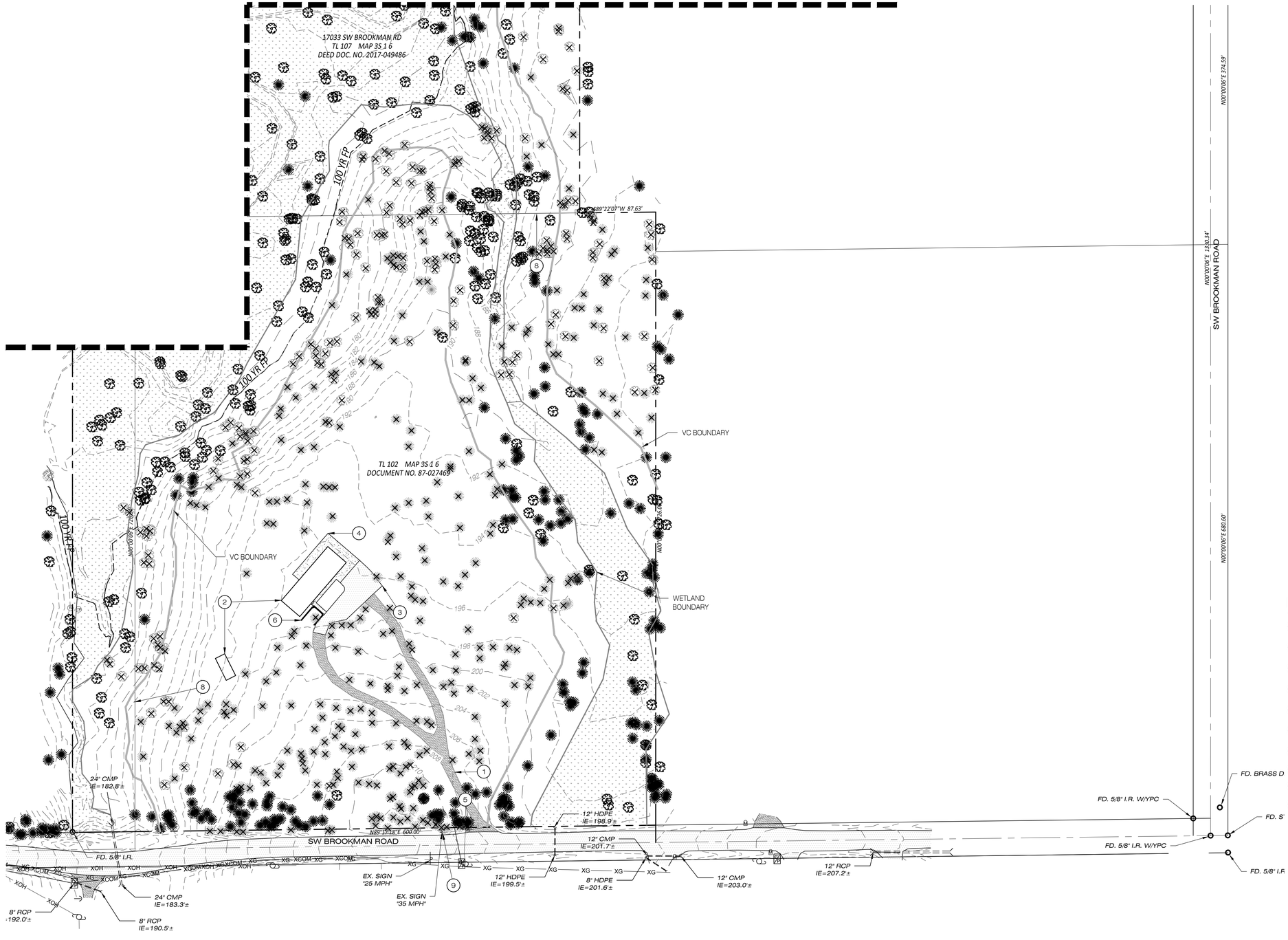

LEGEND

- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- EXISTING LOT LINE
- CENTER LINE
- SD — SD — STORM DRAINAGE LINE
- XSS — XSS — SANITARY SEWER LINE
- XW — XW — WATER LINE
- XG — XG — GAS LINE
- XCOM — COMMUNICATION LINE
- XE — XE — UNDERGROUND POWER LINE
- XOH — XOH — OVERHEAD WIRE
- X — X — WOOD FENCE (AS NOTED)
- 202 — EXISTING 2' CONTOUR
- 200 — EXISTING 10' CONTOUR
- CONIFEROUS TREE (DBH)
- DECIDUOUS TREE (DBH)
- CATCH BASIN/DRAIN INLET
- STORM DITCH INLET
- STORM MANHOLE
- SANITARY MANHOLE
- WATER VALVE
- FIRE HYDRANT ASSEMBLY
- WATER METER
- GAS VALVE
- GAS METER
- STREET SIGN
- MAILBOX
- ELECTRIC PEDESTAL
- LIGHT POLE
- POWER POLE
- COMMUNICATION VAULT
- TELECOMMUNICATION PEDESTAL
- UTILITY EXTENSION
- FOUND SURVEY MONUMENT AS NOTED
- EXISTING CONCRETE
- EXISTING ASPHALT PAVEMENT
- EXISTING GRAVEL SURFACE
- EXISTING BUILDING FOOTPRINT
- EXISTING WOOD DECK
- EXISTING TREE TO BE REMOVED
- -1.0% EXISTING SLOPE DIRECTION
- EXISTING VEGETATED CORRIDOR
- 100-YEAR FLOOD PLAIN
- EXISTING WETLANDS

DEMOLITION NOTES

1. EXISTING GRAVEL DRIVEWAY TO BE REMOVED.
2. EXISTING BUILDING TO BE REMOVED.
3. EXISTING PAVEMENT TO BE REMOVED.
4. EXISTING CONCRETE TO BE REMOVED.
5. EXISTING MAILBOX TO BE REMOVED.
6. EXISTING WALLS TO BE REMOVED.
7. EXISTING BARRICADE TO BE REMOVED.
8. EXISTING PROPERTY LINE TO BE VACATED.
9. EXISTING SIGN TO BE REMOVED AND REPLACED.
10. EXISTING POLE TO BE RELOCATED

SCALE
60 0 30 60
1 INCH = 60 FEET

215
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EXISTING CONDITIONS AND DEMOLITION PLAN (SOUTH)

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	REF.	
Project No.	285-021		
Horiz. Scale:			
Vert. Scale:			

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No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
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P2.0

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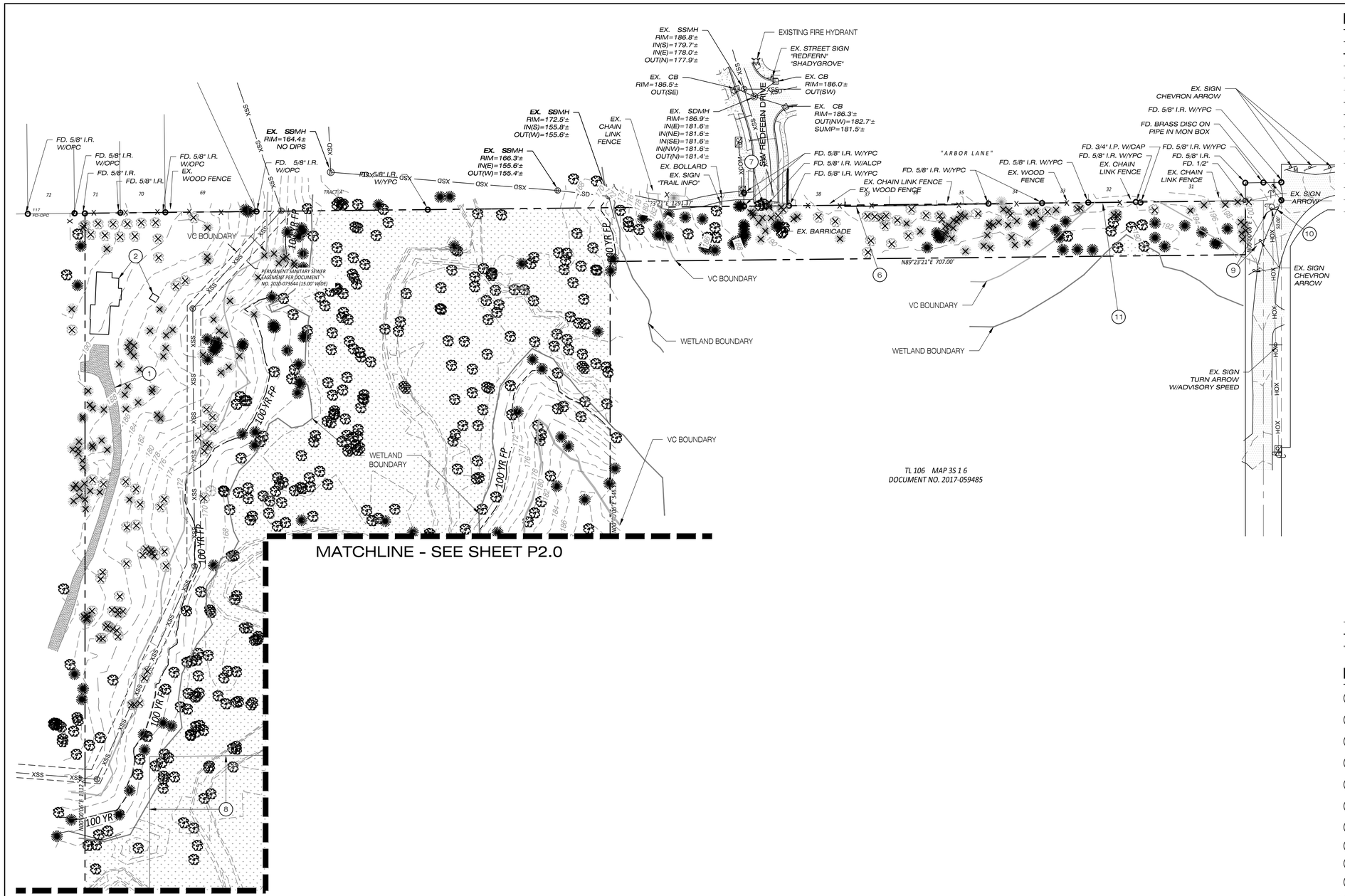

LEGEND

- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- EXISTING LOT LINE
- CENTER LINE
- STORM DRAINAGE LINE
- SANITARY SEWER LINE
- WATER LINE
- GAS LINE
- COMMUNICATION LINE
- UNDERGROUND POWER LINE
- OVERHEAD WIRE
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- EXISTING 10' CONTOUR
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- WATER METER
- GAS VALVE
- GAS METER
- STREET SIGN
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- ELECTRIC PEDESTAL
- LIGHT POLE
- POWER POLE
- COMMUNICATION VAULT
- TELECOMMUNICATION PEDESTAL
- UTILITY EXTENSION
- FOUND SURVEY MONUMENT AS NOTED
- EXISTING CONCRETE
- EXISTING ASPHALT PAVEMENT
- EXISTING GRAVEL SURFACE
- EXISTING BUILDING FOOTPRINT
- EXISTING WOOD DECK
- EXISTING TREE TO BE REMOVED
- -1.0% EXISTING SLOPE DIRECTION
- EXISTING VEGETATED CORRIDOR
- 100-YEAR FLOOD PLAIN
- EXISTING WETLANDS

DEMOLITION NOTES

1. EXISTING GRAVEL DRIVEWAY TO BE REMOVED.
2. EXISTING BUILDING TO BE REMOVED.
3. EXISTING PAVEMENT TO BE REMOVED.
4. EXISTING CONCRETE TO BE REMOVED.
5. EXISTING MAILBOX TO BE REMOVED.
6. EXISTING WALLS TO BE REMOVED.
7. EXISTING BARRICADE TO BE REMOVED.
8. EXISTING PROPERTY LINE TO BE VACATED.
9. EXISTING SIGN TO BE REMOVED AND REPLACED.
10. EXISTING POLE TO BE RELOCATED
11. EXISTING FENCE TO BE RELOCATED

SCALE
60 0 30 60
1 INCH = 60 FEET

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EXISTING CONDIITONS AND DEMOLITION PLAN (NORTH)

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

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No.	Date	Revision	By

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CEDAR CREEK GARDENS
No.
285-021
Type
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Sheet
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Exhibit A30

MATCHLINE - SEE SHEET P2.3

LEGEND

- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- PROPOSED VEGETATED CORRIDOR
- 100-YEAR FLOOD PLAIN
- EXISTING WETLANDS

SCALE
60 0 30 60
1 INCH = 60 FEET

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PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN (SOUTH)

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
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Vert. Scale:			

28521_P2.1tree.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P2.2

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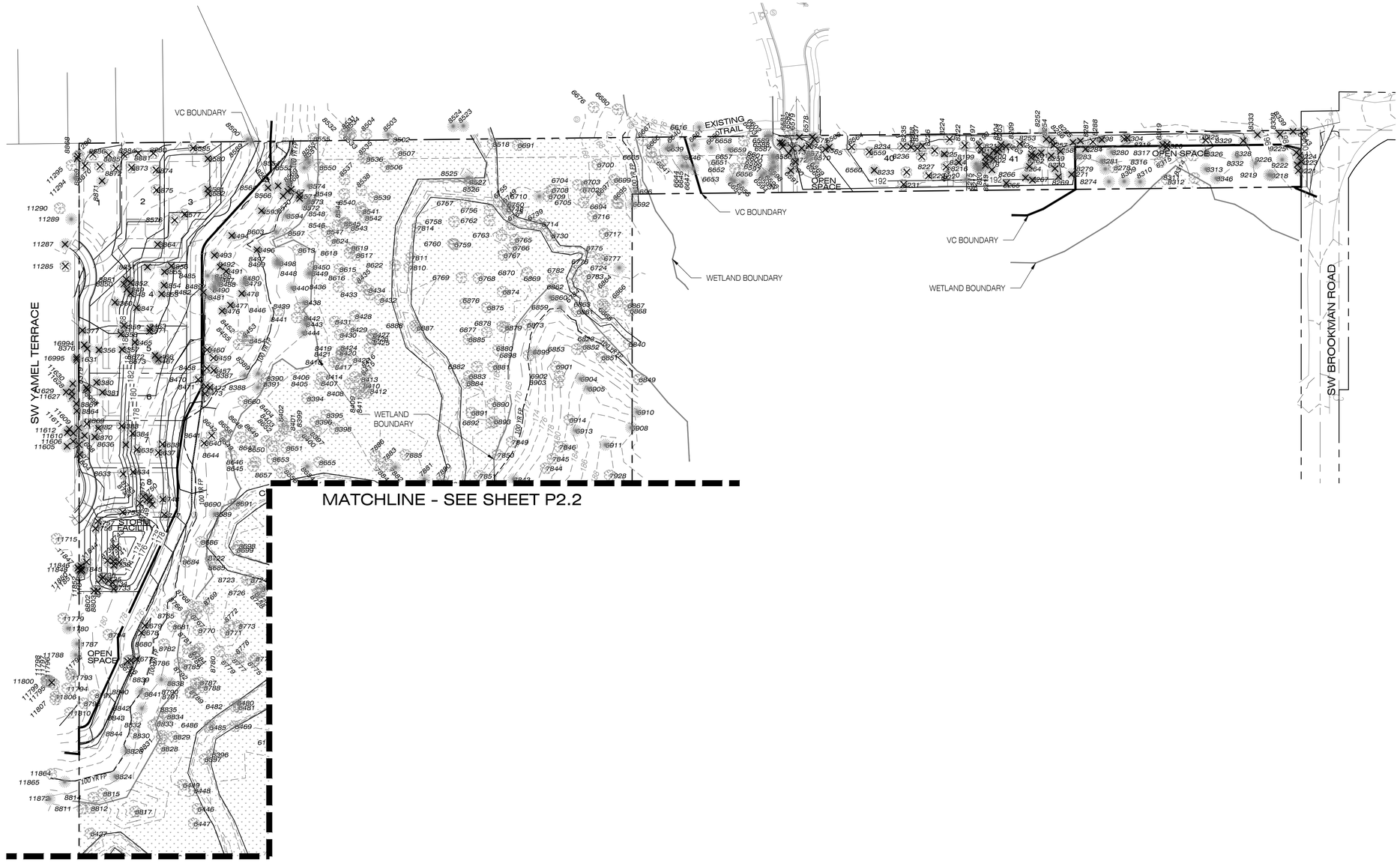

LEGEND

- 171 — EXISTING 1' CONTOUR
- 175 — EXISTING 5' CONTOUR
- 171 — PROPOSED 1' CONTOUR
- 175 — PROPOSED 5' CONTOUR
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- PROPOSED VEGETATED CORRIDOR
- 100-YEAR FLOOD PLAIN
- EXISTING WETLANDS

SCALE
60 0 30 60
1 INCH = 60 FEET

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PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN (NORTH)

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
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Horiz. Scale:			
Vert. Scale:			

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No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
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P2.3

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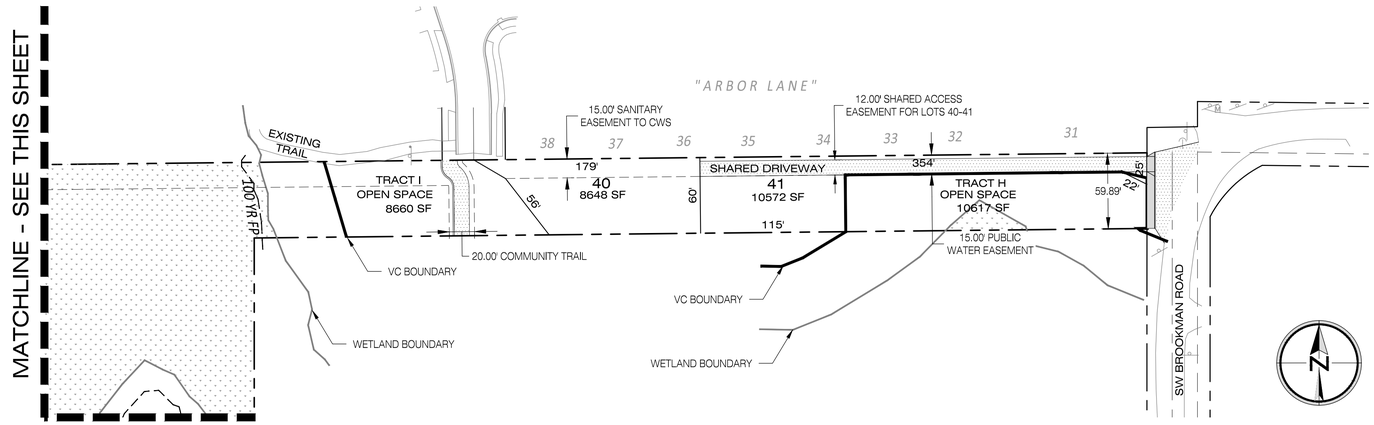

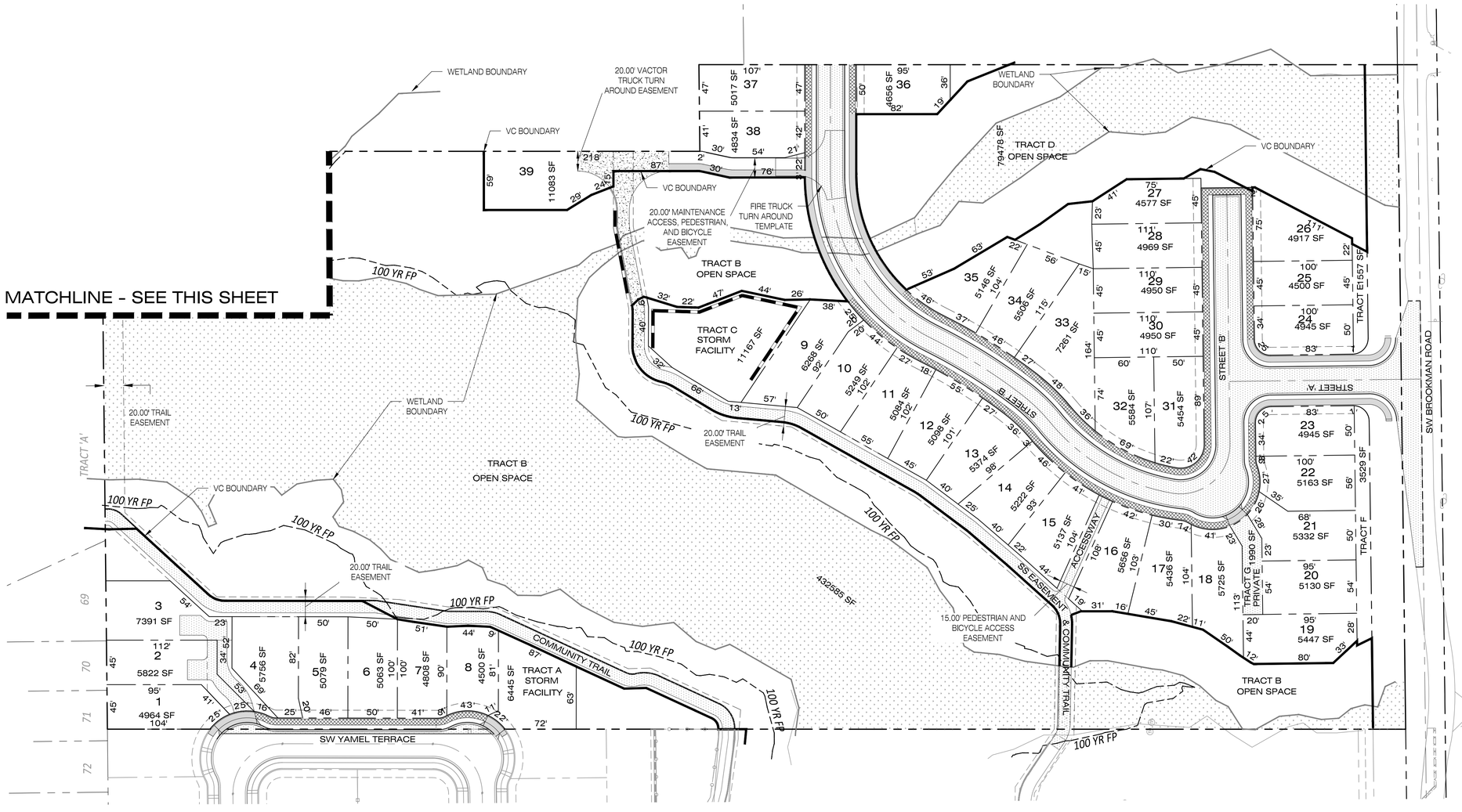

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PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

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Vert. Scale:			

28521_P3.0plat.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.0

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Exhibit A30

MATCHLINE - SEE THIS SHEET

"ARBOR LANE"

EXISTING TRAIL

TRACT I
OPEN SPACE

20.00' COMMUNITY TRAIL

38 37 36 35 34 33 32 31

40

41

SHARED DRIVEWAY

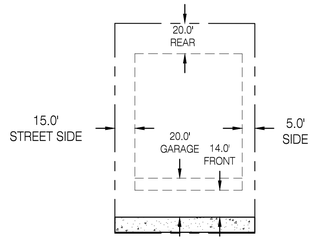
TRACT H
OPEN SPACE

SW BROOKMAN ROAD

N

SETBACK REQUIREMENTS

FRONT YARD:	14 FT.
FACE OF GARAGE:	20 FT.
SIDE YARD:	5 FT.
STREET SIDE YARD:	15 FT.
REAR BUILDING:	20 FT.



SETBACK REQUIREMENTS
NTS

= SOLAR ACCESS AVAILABLE

MATCHLINE - SEE THIS SHEET

37 36 38 39

VACTOR TRUCK TURN AROUND EASEMENT

FIRE TRUCK TURN AROUND TEMPLATE

TRACT B
OPEN SPACE

TRACT C
STORM
FACILITY

TRACT D
OPEN SPACE

TL 102 MAP 3S 1 6
DOCUMENT NO. 87-027469

27 28 29 30 26 25 24

20.00' GARAGE SETBACK (TYP.)

14.00' FRONT YARD SETBACK (TYP.)

5.00' SIDE YARD SETBACK (TYP.)

TRACT E

STREET 'B'

15.00' STREET SIDE YARD SETBACK (TYP.)

35 34 33 9 10 11 12 13 14 15 16 17 18

STREET 'B'

20.00' REAR YARD SETBACK (TYP.)

32 31

STREET 'A'

23 22 21 20 19

TRACT G
PRIVATE

TRACT F

SW BROOKMAN ROAD

ACCESSWAY

SS EASEMENT & COMMUNITY TRAIL

17033 SW BROOKMAN RD
TL 107 MAP 3S 1 6
DEED DOC. N 017-049486

TRACT B
OPEN SPACE

TRACT 'A'

20.00' COMMUNITY TRAIL EASEMENT

20.00' REAR YARD SETBACK (TYP.)

5.00' SIDE YARD SETBACK (TYP.)

COMMUNITY TRAIL

69 70 71 72

3 2 1 4 5 6 7 8

TRACT A
STORM
FACILITY

SW YAMEL TERRACE

14.00' FRONT YARD SETBACK (TYP.)

20.00' GARAGE SETBACK (TYP.)

N

SCALE
60 0 30 60
1 INCH = 60 FEET

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CONCEPTUAL BUILDING SETBACK PLAN

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
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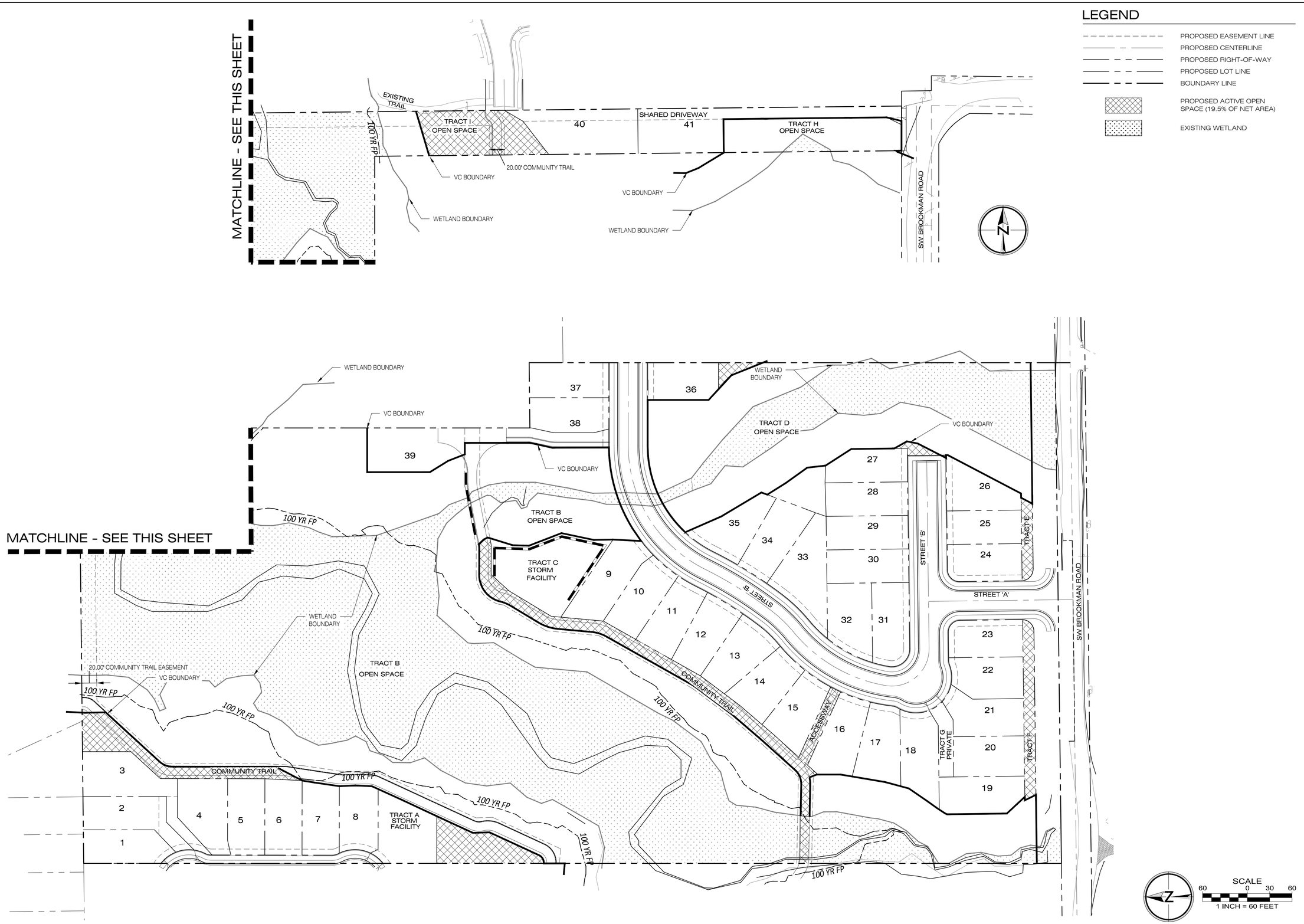
Horiz. Scale:			
Vert. Scale:			
28521_P3.1stbk.dwg			

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.1

Exhibit A30



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CONCEPTUAL OPEN SPACE PLAN

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

	Designed by	MLS	Date	08/2021
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	Reviewed by	MLS	Date	08/2021
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	Vert. Scale:			

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No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.2

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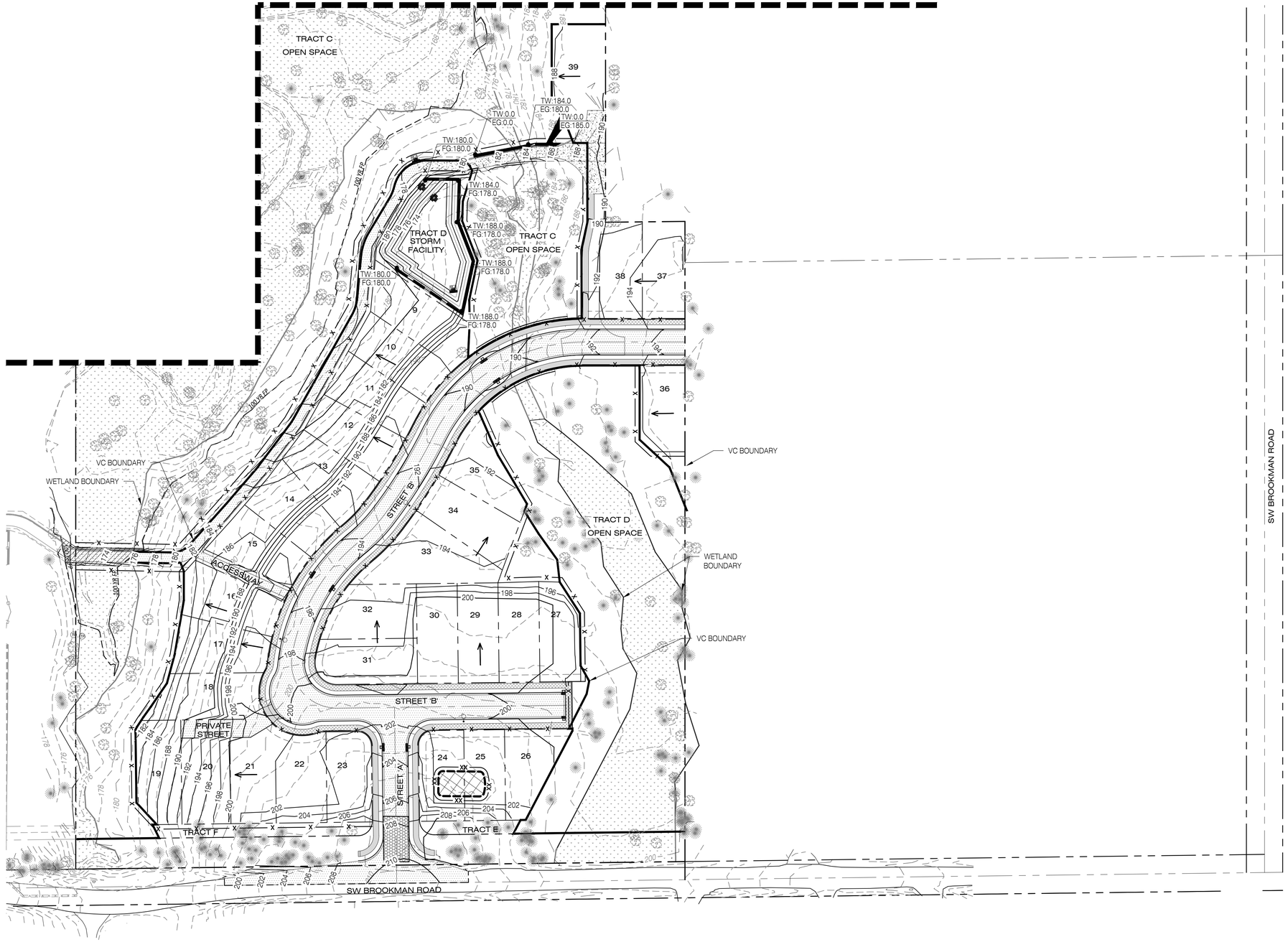
Exhibit A30

MATCHLINE - SEE SHEET P4.1



LEGEND

- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- PROPOSED EROSION CONTROL FENCING
- PROPOSED CONCRETE RETAINING WALL
- PROPOSED FLOW LINE
- FLOOD PLAIN CUT/FILL
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED STOCKPILE LOCATION
- TW:170.8 FG:168.7 — PROPOSED WALL HEIGHT
- TYPE 4 INLET PROTECTION

CUT / FILL FLOOD PLAIN

PROPOSED CUT = 157 CY

PROPOSED FILL = 152 CY

NET CUT / FILL = 5 CY CUT

SCALE
60 0 30 60
1 INCH = 60 FEET

PIONEER DESIGN GROUP
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PRELIMINARY GRADING AND EROSION CONTROL PLAN (SOUTH)

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P4.0grad.dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P4.0

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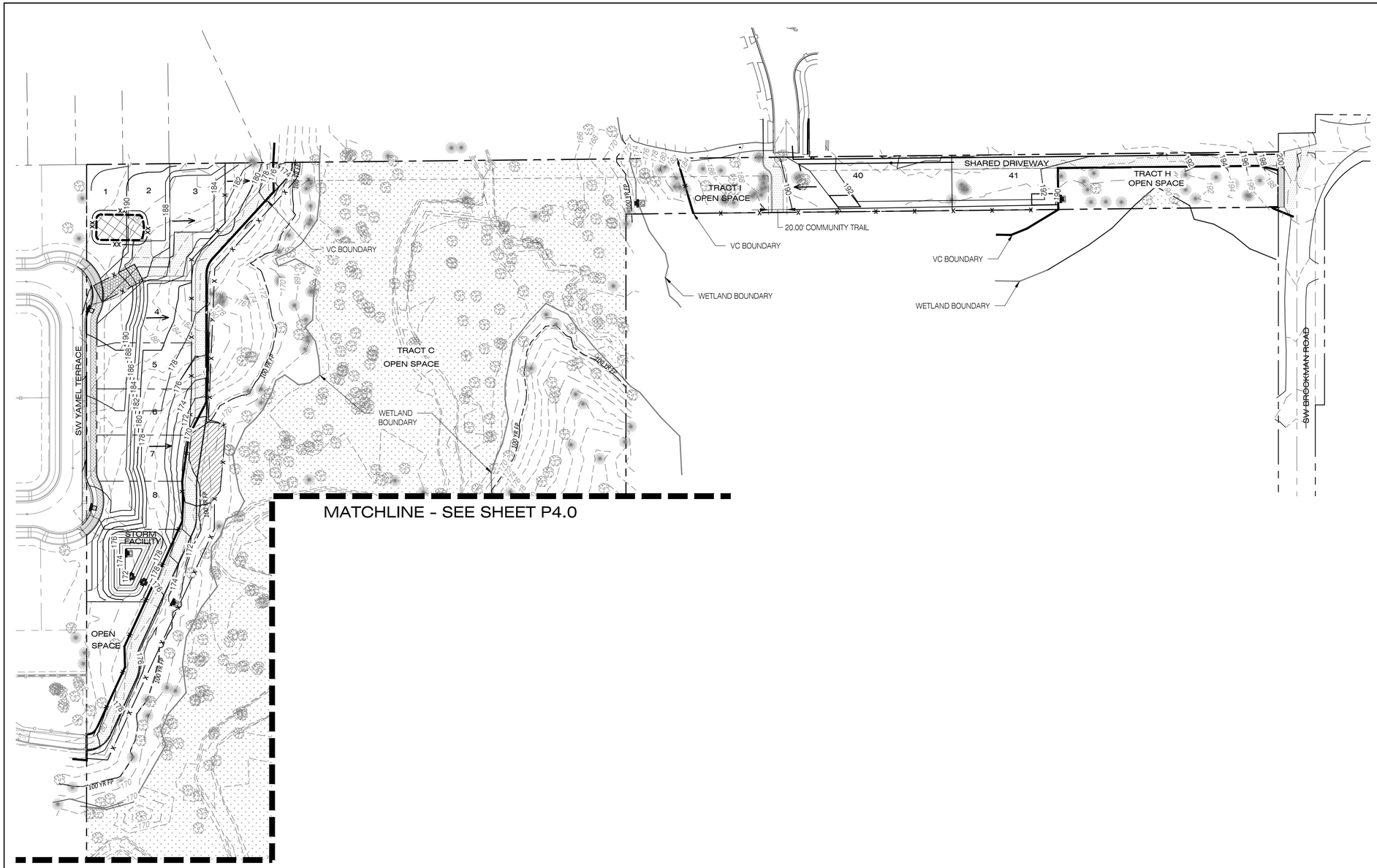

LEGEND

- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- PROPOSED EROSION CONTROL FENCING
- PROPOSED CONCRETE RETAINING WALL
- PROPOSED FLOW LINE
- FLOOD PLAIN CUT/FILL
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED STOCKPILE LOCATION
- TW:170.8 FG:168.7 — PROPOSED WALL HEIGHT
- TYPE 4 INLET PROTECTION

CUT / FILL FLOOD PLAIN

PROPOSED CUT = 157 CY

PROPOSED FILL = 152 CY

NET CUT / FILL = 5 CY CUT

SCALE
60 0 30 60
1 INCH = 60 FEET

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PRELIMINARY GRADING AND EROSION CONTROL PLAN (NORTH)

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

No.	Revision	By	Date

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
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Project
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No.
285-021
Type
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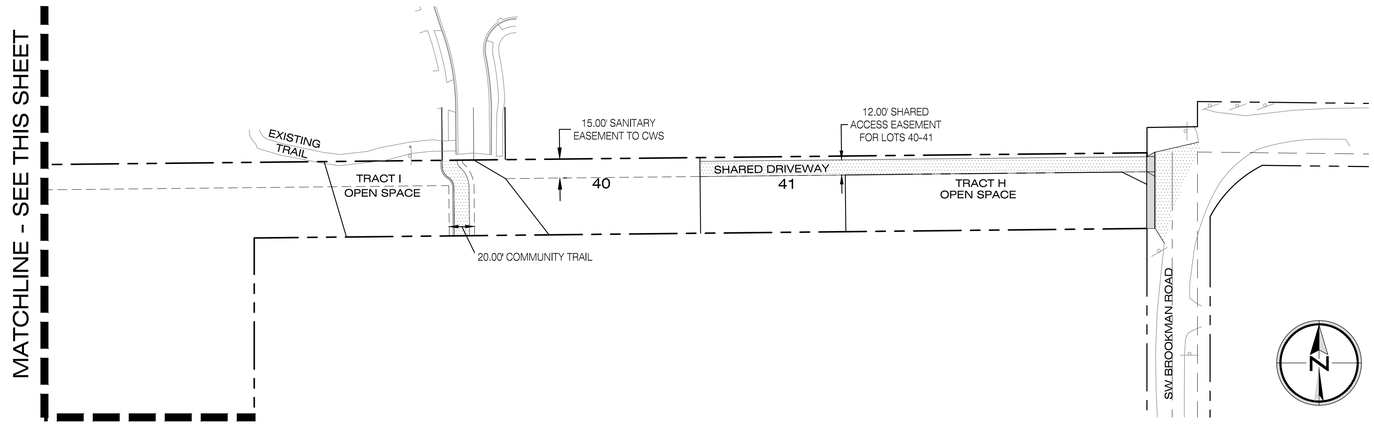
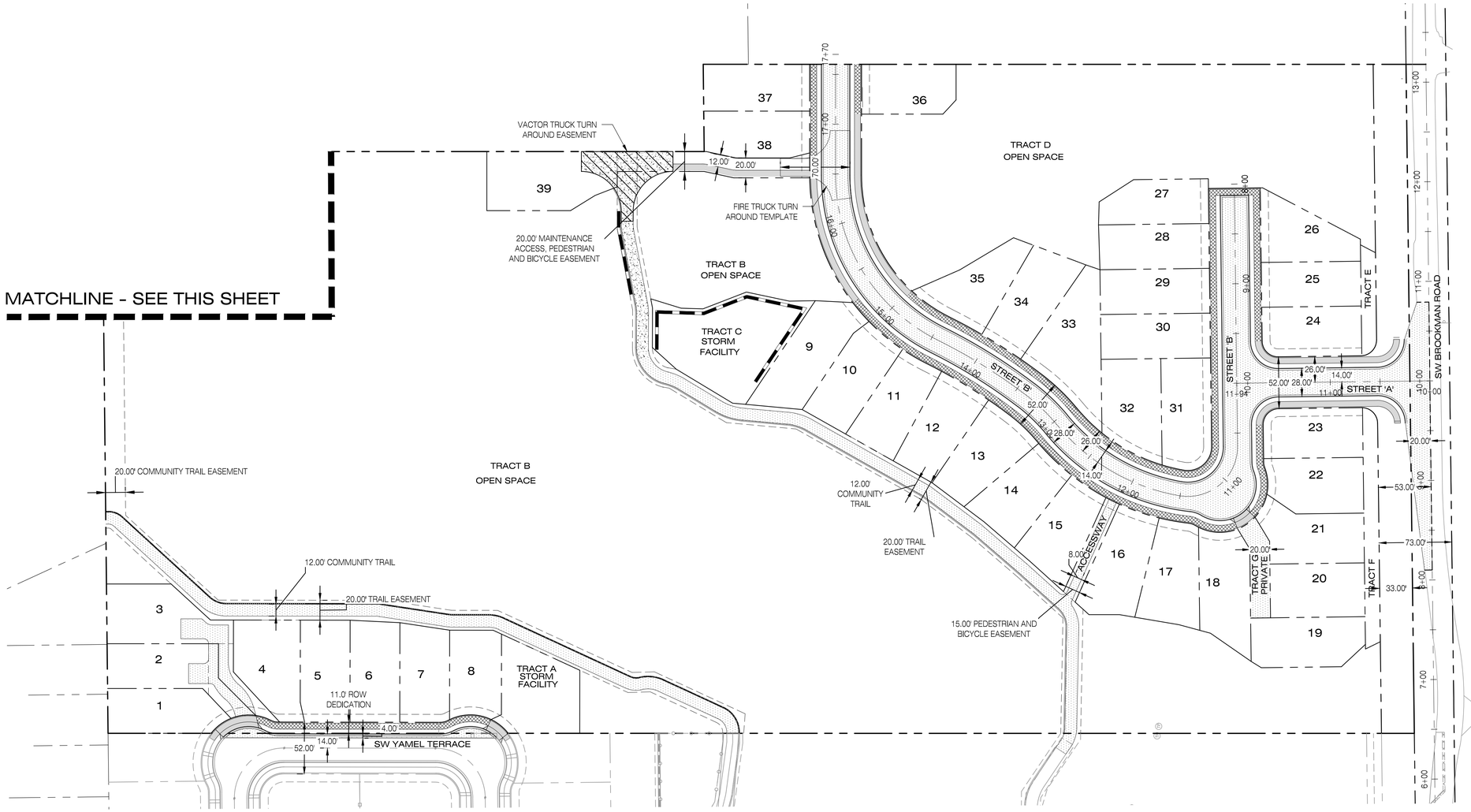


LEGEND

- PROPOSED EASEMENT LINE
- PROPOSED CENTERLINE
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BOUNDARY LINE
- CONCRETE SIDEWALK TO BE BUILT BY HOMEBUILDER
- CONCRETE SIDEWALK TO BE BUILT WITH FACILITY PERMIT
- PROPOSED PAVEMENT



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OVERALL STREET PLAN

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

No.	Revision	By	Date

Designed by	MLS	Date	08/2021
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Project No.	285-021	REF.	
Horiz. Scale:			
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SCALE
60 0 30 60
1 INCH = 60 FEET

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P5.0

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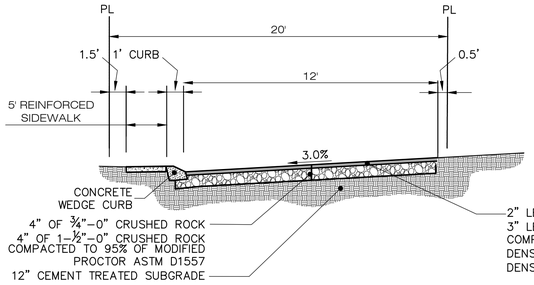
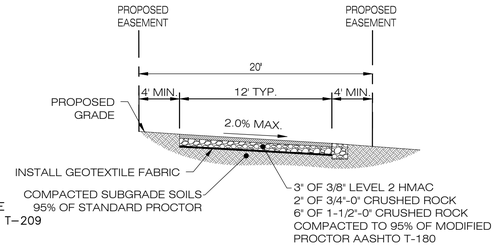
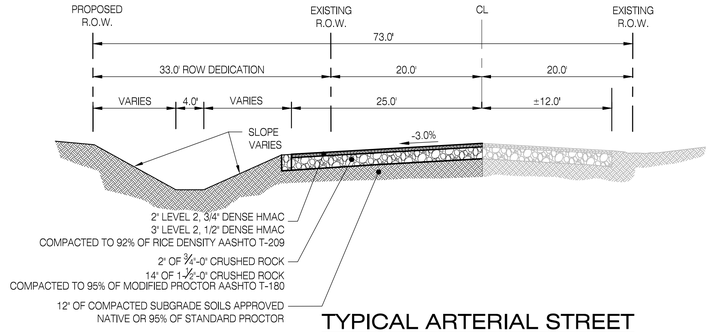


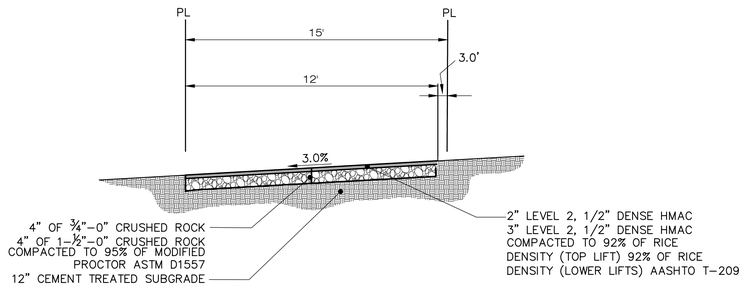
LOT 39 DRIVEWAY
PUBLIC PEDESTRIAN/ BICYCLE ACCESS AND EMERGENCY & MAINTENANCE VEHICLE ACCESS EASEMENT
N.T.S.



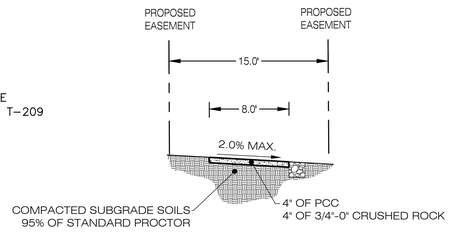
COMMUNITY TRAIL
ALONG CEDAR CREEK
N.T.S



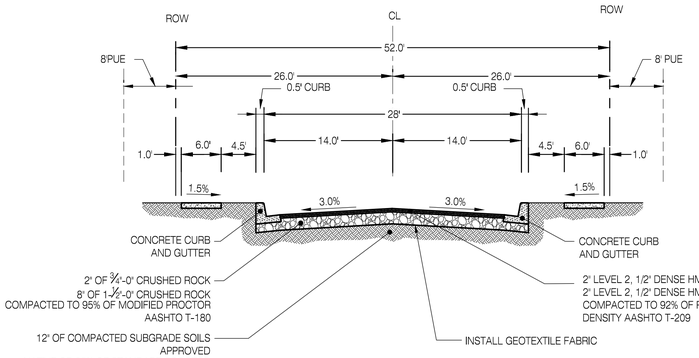
TYPICAL ARTERIAL STREET
SW BROOKMAN ROAD
N.T.S.



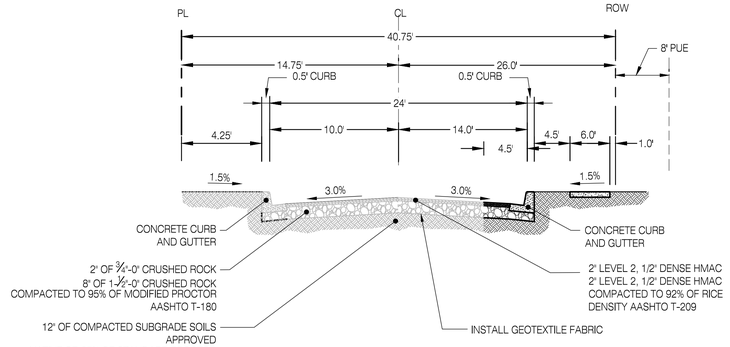
LOT 40 & 41 SHARED DRIVEWAY
EMERGENCY VEHICLE ACCESS EASEMENT
N.T.S.



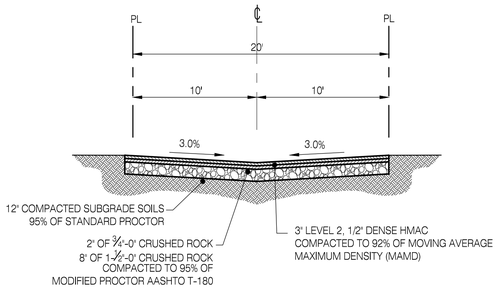
TYPICAL PEDESTRIAN/BICYCLE PATH
WALKWAY BETWEEN LOTS 15 & 16
N.T.S.



TYPICAL LOCAL STREET
STREET 'A' AND STREET 'B'
N.T.S.



TYPICAL LOCAL STREET
SW YAMEL TERRACE
N.T.S.



TYPICAL PRIVATE STREET
TRACT G
N.T.S.

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TYPICAL SECTIONS

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
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Project No.	285-021	REF.	
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No.	Date	Revision	By

Project CEDAR CREEK GARDENS
No. 285-021
Type PLANNING
Sheet P5.1

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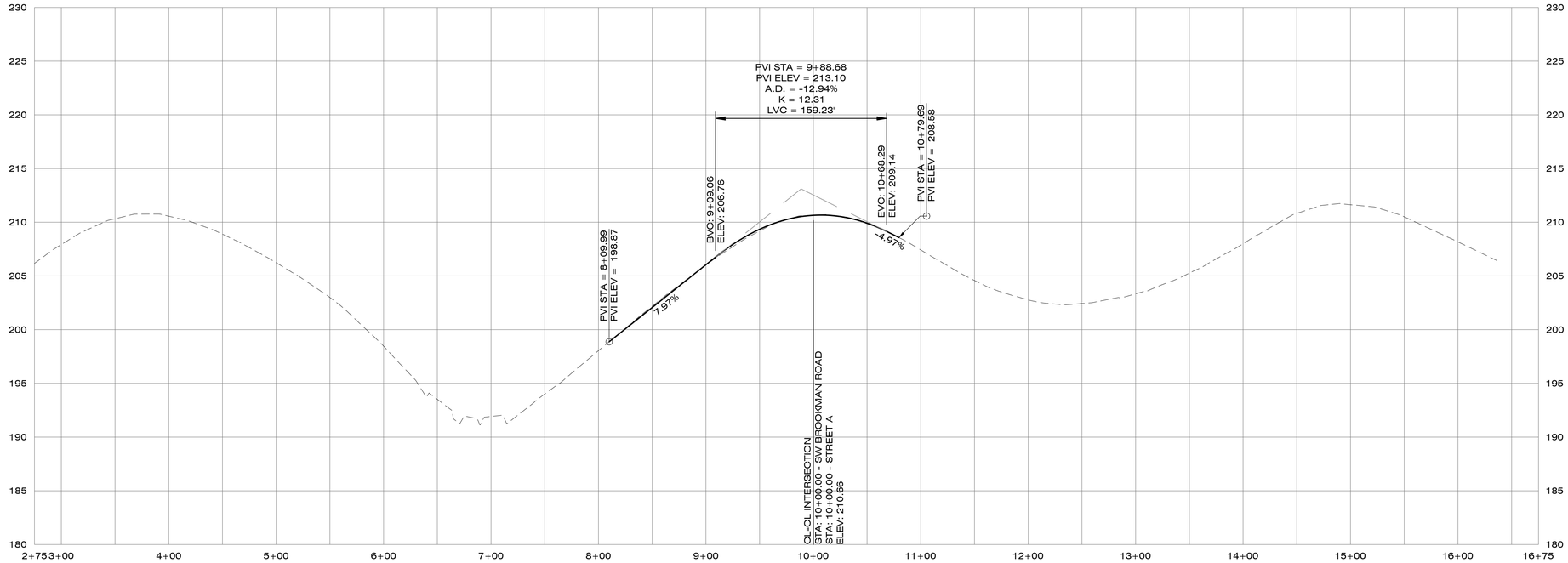
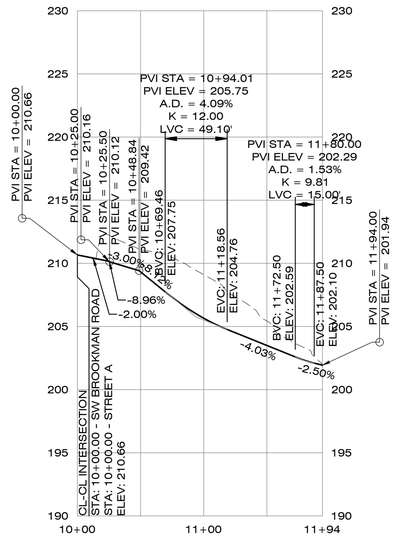
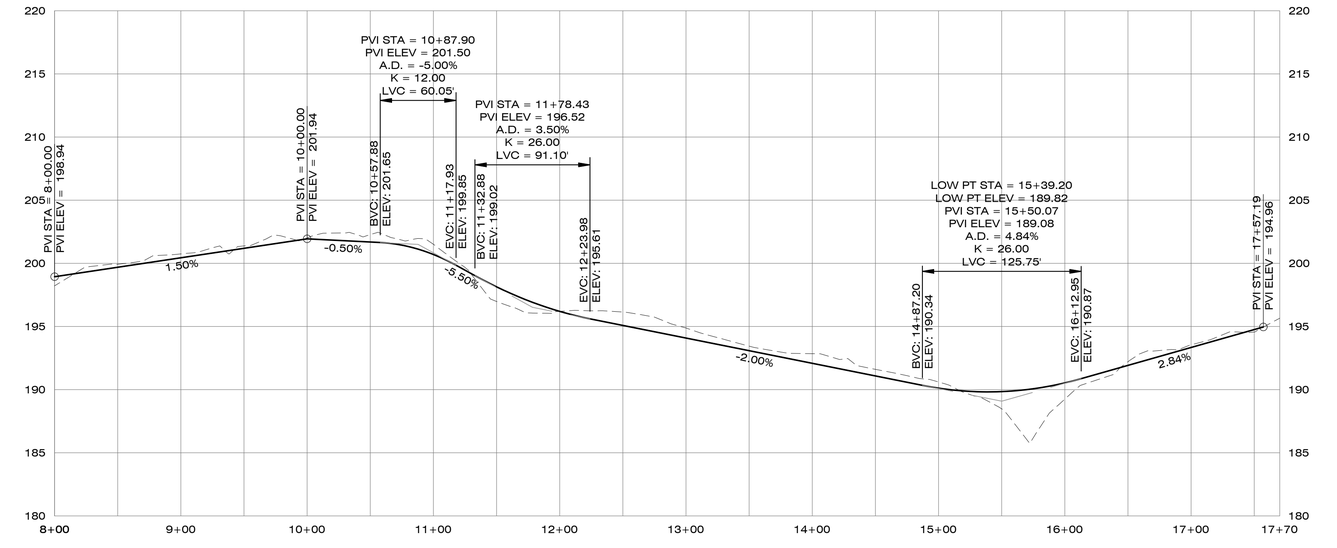


SW BROOKMAN ROAD PROIFLE
SCALE: 1"=60' (H), 1"=6' (V)



STREET 'A' PROFILE
SCALE: 1"=60' (H), 1"=6' (V)



STREET B PROFILE
SCALE: 1"=60' (H), 1"=6' (V)

215
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PRELIMINARY STREET PROFILES

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
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Project No.	285-021	REF.	
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No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
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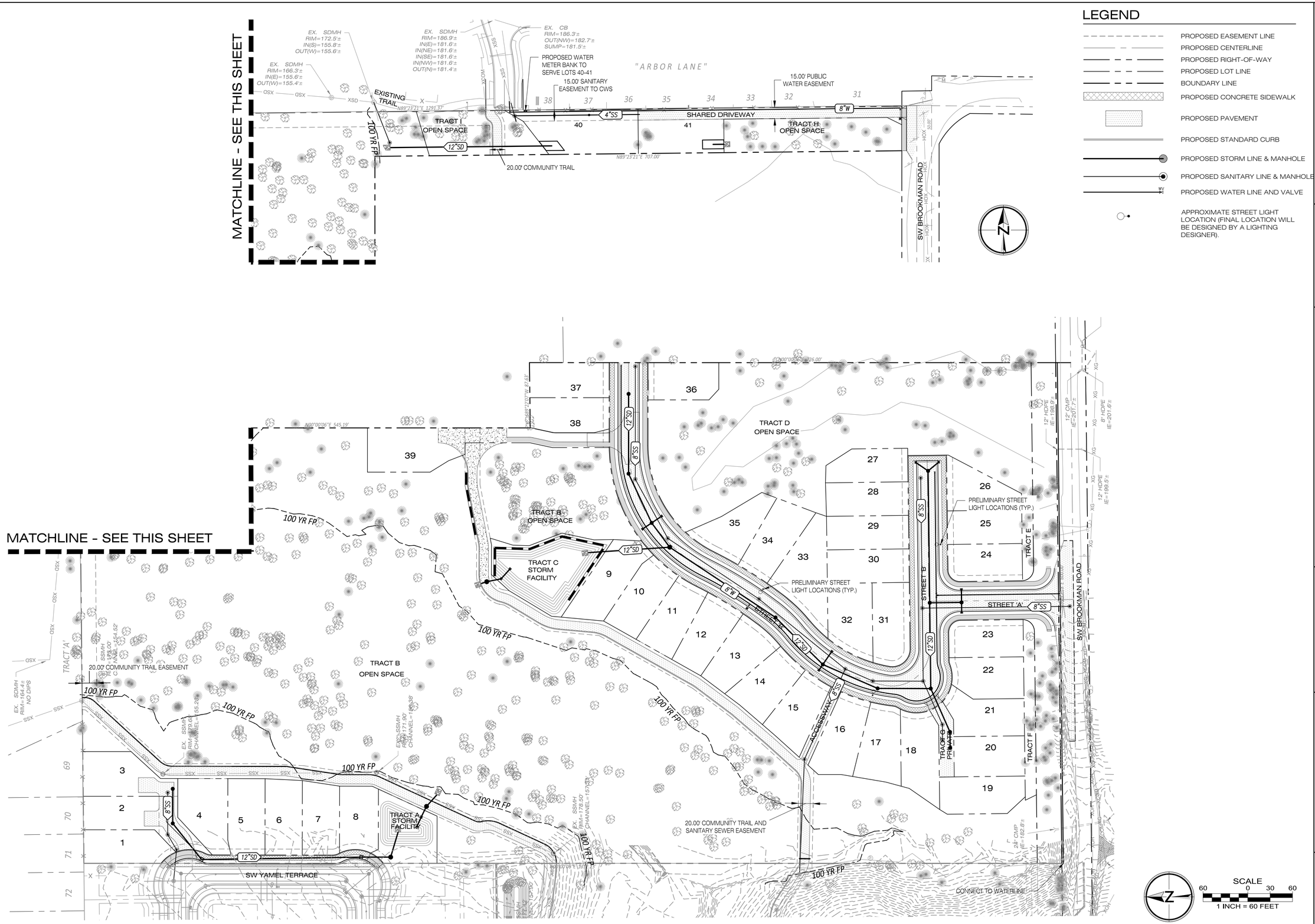

LEGEND

- PROPOSED EASEMENT LINE
- PROPOSED CENTERLINE
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BOUNDARY LINE
- PROPOSED CONCRETE SIDEWALK
- PROPOSED PAVEMENT
- PROPOSED STANDARD CURB
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATER LINE AND VALVE
- APPROXIMATE STREET LIGHT LOCATION (FINAL LOCATION WILL BE DESIGNED BY A LIGHTING DESIGNER).

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PRELIMINARY COMPOSITE UTILITY PLAN

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021		REF.
Horiz. Scale:			
Vert. Scale:			

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No.	Date	Revision	By

Project CEDAR CREEK GARDENS
No. 285-021
Type PLANNING
Sheet **P6.0**

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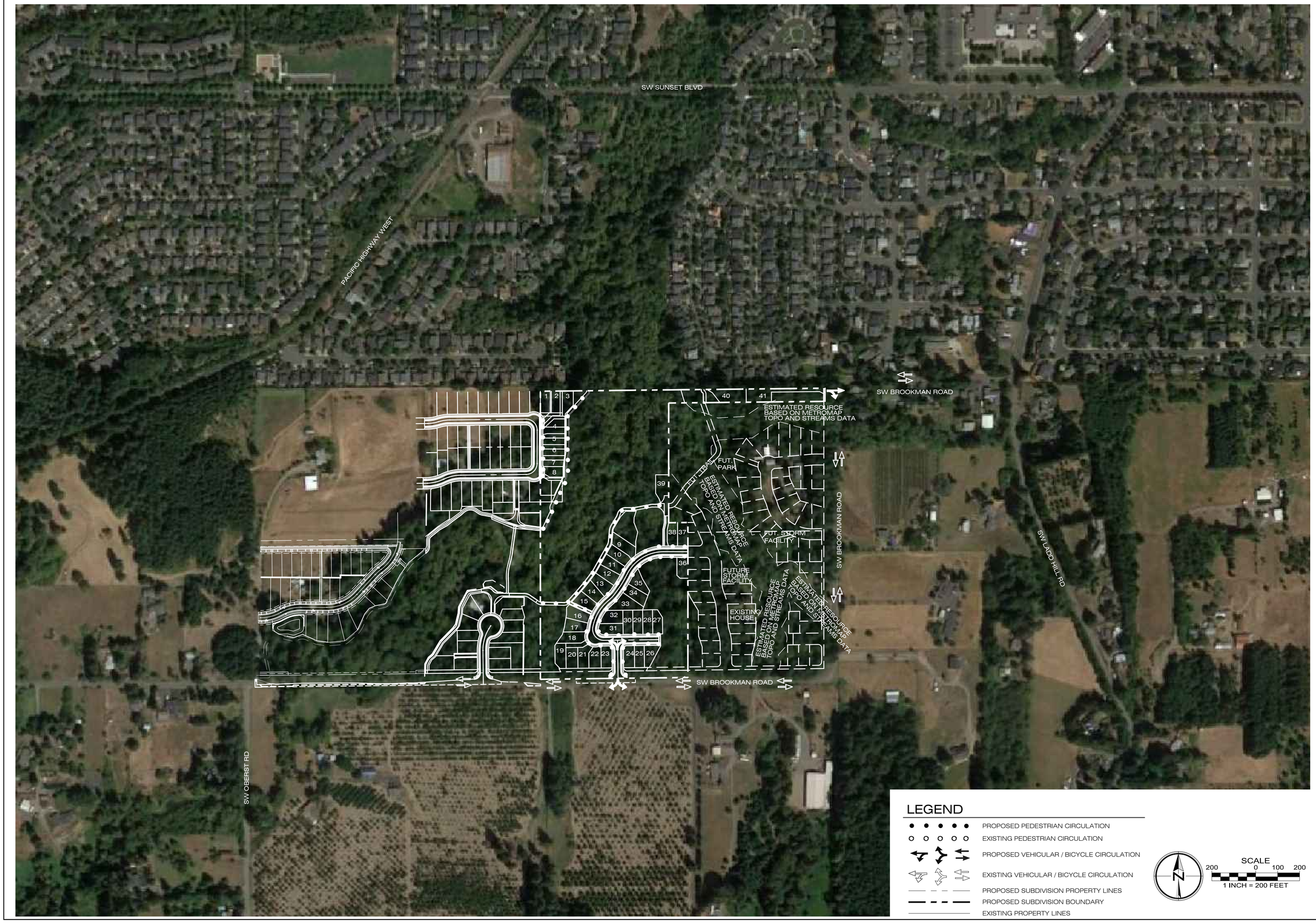

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CONCEPTUAL FUTURE CONNECTIVITY PLAN

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

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No.	Date	Revision	By

Project CEDAR CREEK GARDENS
No. 285-021
Type PLANNING
Sheet

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NOTES:

1. SEE SHEET L2 FOR LANDSCAPE PLANTING LEGENDS, NOTES & DETAILS
2. SEE CITY OF SHERWOOD STREET TREE DETAIL SHEET L2 FOR ALL STREET TREES.
3. ALL STREET TREE PLANTER STRIPS TO BE PLANTED WITH SOD/LAWN.
4. A PERMANENT UNDERGROUND IRRIGATION SYSTEM WILL BE PROVIDED FOR ALL STREET TREE LAWN AREAS. TO BE DESIGN BUILD BY LANDSCAPE CONTRACTOR.
5. ALL STREET TREES ARE TO BE INSTALLED WITH A GEO TEXTILE ROOT CONTROL SYSTEM PER CITY OF SHERWOOD DETAIL SHEET L2.
6. SEE CIVIL PLANS FOR TREE PRESERVATION & REMOVAL PLAN.
7. CONTOURS SHOWN AT 2' AND 10' INTERVALS FOR REFERENCE ONLY.

LEGEND:

SEE SHEET L2 FOR PROPOSED OPEN SPACE AND MITIGATION AREA PLANTING LEGENDS

SEE SHEET L2 FOR PROPOSED STORM WATER PLANTING LEGEND

INDIVIDUAL LOT - LIDA STORMWATER FACILITY

EXISTING TREES TO REMAIN - SEE TREE PRESERVATION AND REMOVAL PLANS

TREE CANOPY REQUIREMENTS

NET BUILDABLE AREA = 297,276 SF
297,276 x 40% = 96,898 SF OF TREE CANOPY REQUIRED

EXISTING TO BE RETAINED = 48,550 SF (97,000SF AFTER CREDIT*)
= 32.6% OF NET BUILDABLE AREA.

PROPOSED STREET TREES / OPEN SPACE TREES = 41,448 SF
41448 + 97,000 = 138,448 = 46.57% CANOPY PROVIDED/RETAINED.

*SIXTY-EIGHT TREES WILL BE RETAINED OUTSIDE OF ENVIRONMENTALLY CONSTRAINED LANDS. THEIR COMBINED CANOPY AREA IS 48,500 SQUARE FEET. SINCE RETAINED TREES RECEIVE DOUBLE CANOPY CREDIT, THE CREDIT FROM PRESERVATION IS 97,000 SQUARE FEET. THIS REPRESENTS 32.6 PERCENT OF THE NET BUILDABLE AREA.

STREET TREE LEGEND

- SILVER LINDEN
- PYRAMIDAL HORNBEAM
- AMERICAN LINDEN
- TULIP TREE

SCALE
80 0 40 80
1 INCH = 80 FEET

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PRELIMINARY STREET TREE & OPEN SPACE PLANTING PLAN

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
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No.	Date	Revision	By

Project
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No.
285-021
Type
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L1

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PLANTING LEGEND

PROPOSED STREET / OPENSPACE TREES

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	SIZE	CANOPY AREA	TOTAL CANOPY AREA
	8	PYRAMIDAL HORNBEAM / CARPINUS BETULUS PYRAMIDALIS	2" CAL., B&B - MIN. 6' HT.	1,256 S.F.	10,048 SF
	19	AMERICAN LINDEN / TILIA AMERICANA	2" CAL., B&B - MIN. 6' HT.	1,256 S.F.	23,864 SF
	6	SILVER LINDEN / TILIA TOMENTOSA	2" CAL., B&B - MIN. 6' HT.	1,256 S.F.	7,536 SF
					41,448 SF
	10,743 S.F	LAWN / SOD			

OPEN SPACE & MITIGATION PRELIMINARY PLANTING LEGEND

TREES - WHERE FEESIBLE

SYMBOL	COMMON NAME / BOTANICAL NAME	SIZE
	DOUGLAS FIR / PSEUDOTSUGA MENZIESII	2" CAL., B&B - MIN. 6' HT.
	WESETERN RED CEDAR / THUJA PLICATA	2" CAL., B&B - MIN. 6' HT.
	BIG LEAF MAPLE / ACER MACROPHYLLUM	2" CAL., B&B - MIN. 6' HT.
	OREGON WHITE OAK / QUERCUS GARRYANA	6'-8' HT., B&B
	INCENSE CEDAR / CALOCEDRUS DECURRENS	8'-10' HT., B&B

SHRUBS

COMMON NAME / BOTANICAL NAME	SIZE
REDTWIG DOGWOOD /CORNUS STOLONIFERA	2 GAL.
PACIFIC NINEBARK / PHYSOCARPUS CAPITATUS	2 GAL.
CLUSTER ROSE / ROSA PISOCARPA	2 GAL.
DOUGLAS SPIREA / SPIREA DOUGLASII	2 GAL.
MOCK ORANGE / PHILADELPHUS LEWISII	2 GAL.

GRASS SEED

CLEAN WATER "LOWGROW" SEED MIX: 120 LB PER ACRE	
DWARF TALL FESCUE / FESTUCA ARUNDINACEA	40%
PR8820 DWARF PERENNIAL RYEGRASS / LOLIUM PERENNE 'PR8820'	30%
CREEPING RED FESCUE / FESTUCA RUBRA	25%
HIGHLAND COLONIAL BENTGRASS / AGROSTIS TENUIS 'HIGHLAND'	05%

*APPLY WITH ¾" THICK COVER OF GREEN DUED FINE GROUND WOOD CELLULOSE MULCH. PROVIDE 100% EROSION AND WEED FREE COVERAGE. RE-SEED AND WEED AS NEEDED.

NOTE:

1. LANDSCAPE AREAS WILL BE PROVIDED WITH AN AUTOMATIC UNDERGROUND IRRIGATION SYSTEM DESIGNED BY CONTRACTOR. CONTRACTOR WILL PROVIDE MATERIALS AND INSTALL ALL IRRIGATION DOWNSTREAM OF THE WATER METER.
2. MITIGATION PLANTING MATERIAL AND LOCATIONS TO BE BASED OFF FINAL SPL APPROVAL.

PROPOSED STORMWATER FACILITIES - PLANTING LEGEND TRACTS 'B' & 'D'

TREES

SYMBOL	COMMON NAME / BOTANICAL NAME: SIZE AND DESCRIPTION	CONDITION
	OREGON ASH / FRAXINUS LATIFOLIA: 2 GAL. / 3' HT.	MOIST
	BITTER CHERRY / PRUNUS EMARGINATA 'MOLLIS': 2 GAL. / 3' HT.	MOIST
	VINE MAPLE / ACER CIRCINATUM: 2 GAL. / 3' HT.	MOIST

SHRUBS

COMMON NAME / BOTANICAL NAME: SIZE AND DESCRIPTION	CONDITION
MOCK ORANGE / PHILADELPHUS LEWISII: 1 GAL. / 2' HT. / CLUSTER	WET/DRY
RED TWIG DOGWOOD / CORNUS SERICEA: 1 GAL. / 2' HT. / CLUSTER	WET/DRY
PACIFIC NINEBARK / PHYSOCARPUS CAPITATUS: 1 GAL. / 2' HT. / SINGLE	MOIST
CLUSTER ROSE / ROSA PISOCARPA: 1 GAL. / 1.5' HT. / CLUSTER	MOIST
DOUGLAS SPIREA / SPIREA DOUGLASII: 1 GAL. / 1.5' HT. / CLUSTER	WET

HERBACEOUS PLANTS

COMMON NAME / BOTANICAL NAME: SIZE AND DESCRIPTION	CONDITION
SPREADING RUSH / JUNCUS PATENS: PLUGS 1"X6"	MOIST
SLOUGH SEDGE / CAREX OBNUPTA: PLUGS 1"X6"	MOIST

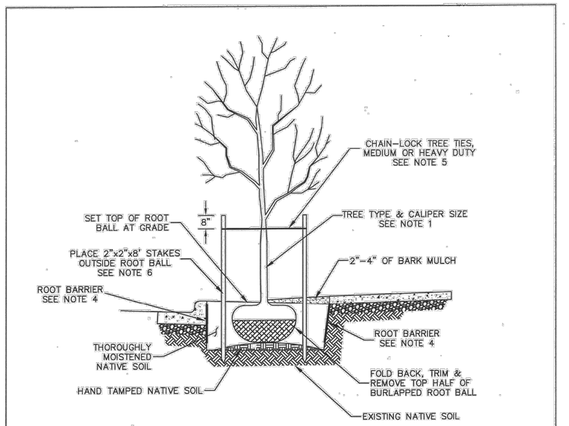
GRASS SEED

COMMON NAME / BOTANICAL NAME: SIZE AND DESCRIPTION	
CLEAN WATER "LOWGROW" SEED MIX: 120 LB PER ACRE	
DWARF TALL FESCUE / FESTUCA ARUNDINACEA	40%
PR8820 DWARF PERENNIAL RYEGRASS / LOLIUM PERENNE 'PR8820'	30%
CREEPING RED FESCUE / FESTUCA RUBRA	25%
HIGHLAND COLONIAL BENTGRASS / AGROSTIS TENUIS 'HIGHLAND'	05%

*APPLY WITH ¾" THICK COVER OF GREEN DUED FINE GROUND WOOD CELLULOSE MULCH. PROVIDE 100% EROSION AND WEED FREE COVERAGE. RE-SEED AND WEED AS NEEDED.

NOTES:

1. ALL STORMWATER REQUIREMENTS INDICATED ARE IN ACCORDANCE WITH CLEAN WATER SERVICES (CWS) R&O 19-22; APPENDIX A - PLANTING REQUIREMENTS.
2. CONTOURS SHOWN AT 2' & 10' INTERVALS
3. WATER QUALITY FACILITY PLANT MATERIAL SHALL BE PROVIDED WITH A TEMPORARY AUTOMATIC IRRIGATION SYSTEM DESIGNED BY CONTRACTOR. CONTRACTOR WILL PROVIDE MATERIALS AND INSTALL ALL IRRIGATION DOWNSTREAM OF THE WATER METER. TEMPORARY IRRIGATION SYSTEM SHALL BE MAINTAINED A MINIMUM OF THREE (3) GROWING SEASONS.



CROSS SECTION

NOTES:

1. TREE SPECIES AND CALIPER SIZE ARE TO BE APPROVED BY THE CITY PLANNING DEPARTMENT.
2. ADJUST PLANTING LOCATIONS SO THAT TREE CROWN OR ROOT BALL DOES NOT CONFLICT WITH ABOVE OR BELOW - GROUND UTILITIES.
3. DO NOT UNDERMINE CURB OR SIDEWALK WHEN EXCAVATING.
4. ALL TREES WITH TRUNKS CLOSER THAN 4' TO ASPHALT OR CONCRETE SURFACE SHALL HAVE A MINIMUM OF AN 18" ROOT BARRIER INSTALLED AT 10' IN LENGTH AND CENTERED ON TREE.
5. PROVIDE A LOOP IN CHAIN-LOCK LARGE ENOUGH TO ALLOW FOR TRUNK GROWTH.
6. TREE STAKES ARE TO BE REMOVED FOLLOWING THE REQUIRED ESTABLISHMENT PERIOD.

	STANDARD DRAWING TITLE	DRAWING NUMBER
City of Sherwood Oregon	STREET TREE DETAIL	RD-80
Any alteration of this drawing may not be associated in any way with the City of Sherwood Standard Drawings.	SCALE: N.T.S.	DATE: MAR '16

GENERAL NOTES: LANDSCAPE PLAN

1. THE CONTRACTOR SHALL VERIFY WITH OWNER AND UTILITY COMPANIES THE LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL DETERMINE IN THE FIELD THE ACTUAL LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL CALL UTILITY PROTECTION SERVICE 72 HOURS PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR SHALL EXAMINE FINISH SURFACE, GRADES, TOPSOIL QUALITY AND DEPTH. DO NOT START ANY WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. VERIFY LIMITS OF WORK BEFORE STARTING.
3. CONTRACTOR TO REPORT ALL DAMAGES TO EXISTING CONDITIONS AND INCONSISTENCIES WITH PLANS TO ODR.
4. ALL PLANT MASSES TO BE CONTAINED WITHIN A BARK MULCH BED, UNLESS NOTED OTHERWISE.
5. BED EDGE TO BE NO LESS THAN 12" AND NO MORE THAN 18" FROM OUTER EDGE OF PLANT MATERIAL BRANCHING. WHERE GROUND-COVER OCCURS, PLANT TO LIMITS OF AREA AS SHOWN.
6. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE IN ALL LANDSCAPE BEDS AND ALL LAWN AREAS.
7. CONTRACTOR TO FINE GRADE AND ROCK-HOUND ALL TURF AREAS PRIOR TO SEEDING, TO PROVIDE A SMOOTH AND CONTINUAL SURFACE, FREE OF IRREGULARITIES (BUMPS OR DEPRESSIONS) & EXTRANEOUS MATERIAL OR DEBRIS.
8. QUANTITIES SHOWN ARE INTENDED TO ASSIST CONTRACTOR IN EVALUATING THEIR OWN TAKE-OFFS AND ARE NOT GUARANTEED AS ACCURATE REPRESENTATIONS OF REQUIRED MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS BID QUANTITIES AS REQUIRED BY THE PLANS AND SPECIFICATIONS. IF THERE IS A DISCREPANCY BETWEEN THE NUMBER LABELED ON THE PLANT TAG AND THE QUANTITY OF GRAPHIC SYMBOLS SHOWN, THE GRAPHIC SYMBOL QUANTITY SHALL GOVERN.
9. COORDINATE LANDSCAPE INSTALLATION WITH INSTALLATION OF UNDERGROUND SPRINKLER AND DRAINAGE SYSTEMS.
10. WITH THE EXCEPTION OF THOSE TREES INDICATED ON THE TREE REMOVAL PLAN, CONTRACTOR SHALL NOT REMOVE ANY TREES DURING CONSTRUCTION WITHOUT THE EXPRESS WRITTEN CONSENT OF THE ODR. EXISTING VEGETATION TO REMAIN SHALL BE PROTECTED AS DIRECTED BY THE ODR.
11. WHERE PROPOSED TREE LOCATIONS OCCUR UNDER EXISTING OVERHEAD UTILITIES OR CROWD EXISTING TREES, NOTIFY ODR TO ADJUST TREE LOCATIONS.
12. LANDSCAPE MAINTENANCE PERIOD BEGINS IMMEDIATELY AFTER THE COMPLETION OF ALL PLANTING OPERATIONS AND WRITTEN NOTIFICATION TO THE ODR. MAINTAIN TREES, SHRUBS, LAWNS AND OTHER PLANTS UNTIL FINAL ACCEPTANCE OR 90 DAYS AFTER NOTIFICATION AND ACCEPTANCE, WHICHEVER IS LONGER.
13. REMOVE EXISTING WEEDS FROM PROJECT SITE PRIOR TO THE ADDITION OF ORGANIC AMENDMENTS AND FERTILIZER. APPLY AMENDMENTS AND FERTILIZER PER THE RECOMMENDATIONS OF THE SOIL ANALYSIS FROM THE SITE.
14. BACK FILL MATERIAL FOR TREE AND SHRUB PLANTING SHALL CONTAIN: ONE PART FINE GRADE COMPOST TO ONE PART TOPSOIL BY VOLUME, BONE MEAL PER MANUFACTURE'S RECOMMENDATION, AND SLOW RELEASE FERTILIZER PER MANUFACTURER'S RECOMMENDATION.
15. GROUND COVERS AND PERENNIALS SHALL BE PLANTED WITH A MAXIMUM 2 INCH COVER OF BARK MULCH WITH NO FOLIAGE COVERED.
16. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER. THESE ITEMS MAY BE REQUIRED TO BE REPLACED WITH PLANT MATERIALS THAT ARE IN COMPLIANCE WITH THE DRAWINGS.
17. ALL PLANT MATERIALS SHALL BE NURSERY GROWN WITH HEALTHY ROOT SYSTEMS AND FULL BRANCHING, DISEASE AND INSECT FREE AND WITHOUT DEFECTS SUCH AS SUN SCALD, ABRASIONS, INJURIES AND DISFIGUREMENT.
18. ALL PLANT MATERIAL SHALL BE INSTALLED AT THE SIZE AND QUANTITY SPECIFIED. THE LANDSCAPE ARCHITECT IS NOT RESPONSIBLE FOR SUB-STANDARD RESULTS CAUSED BY REDUCTION IN SIZE AND/OR QUANTITY OF PLANT MATERIALS.
19. LANDSCAPE AREAS WILL BE PROVIDED WITH AN AUTOMATIC UNDERGROUND IRRIGATION SYSTEM DESIGNED BY CONTRACTOR. CONTRACTOR WILL PROVIDE MATERIALS AND INSTALL ALL IRRIGATION DOWNSTREAM OF THE WATER METER.

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
PORTLAND, OREGON | HONOLULU, HAWAII
PH: 503.643.8286 PH: 808.753.2276
WWW.PD-GRP.COM

PRELIMINARY PLANTING LEGENDS, DETAILS & NOTES

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CFS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

285021-(L1)PLANTING.dwg

No.	Date	Revision	By

Project CEDAR CREEK GARDENS
No. 285-021
Type PLANNING
Sheet L2

Exhibit A31

lancaster mobley
321 SW 4th Ave., Suite 400
Portland, OR 97204
503.248.0313
lancastermobley.com

Memorandum

To: Stacy Shetler, PE
County Engineer
Washington County
Department of Land Use & Transportation
1400 SW Walnut St, Ste 212, MS 17A
Hillsboro, OR 97123

From: Jennifer Danziger, PE

Date: June 23, 2022

Subject: **Cedar Creek Gardens – 41-Lot Subdivision – TIA Study Intersection 5**
Design Exception Request for Sight Distance

REGISTERED PROFESSIONAL ENGINEER
16168
Digitally signed by Jennifer Danziger
Date: 2022.06.23 16:09:24-07'00'
OREGON
SEPT. 15, 1992
JENNIFER ELISE DANZIGER

RENEWS: 12/31/2023

WASHINGTON COUNTY ROAD DESIGN AND CONSTRUCTION STANDARDS REQUEST FOR EXCEPTION

The following is a request for exception as per Section 501.8.5.F of the Washington County Community Development Code Standards.

Request

The Cedar Creek Gardens subdivision proposes to include two lots (40 and 41) with shared driveway access on SW Brookman Road. The proposed access is located near a curve in SW Brookman Road. While the driveway will meet the Washington County sight distance standards for traffic exiting the site, a design exception is needed for the left-turn movement into the shared driveway. The request is to allow the stopping sight distance standard from *A Policy of Geometric Design of Highways and Streets*[1], the current AASHTO manual, to be applied for this movement rather than the intersectional sight distance standard detailed in Section 501.8.5.F of the Washington County Community Development Code (CDC).

Reason

The subject development is a 41-Lot subdivision of Tax Lots 102 & 107, Tax Map 3S1 06, located within the Brookman Road Concept Plan area of the City of Sherwood (see Exhibit A: Location Map, attached). As a result of the location of Cedar Creek, along with several unnamed tributaries flowing through the site, the site is divided into 3 distinct and isolated developable areas (see Exhibit B: Figure 4, Site Plan, and Exhibit C: Sheet

[1] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.

P3.0, Preliminary Plat. Of the 3 developable areas, the northwest portion of the site will support 8 lots, all of which will be accessed from the west via local public streets within the proposed Reserve at Cedar Creek Subdivision (under construction); 31 of the lots will obtain access to SW Brookman Road to the south via a new interior local public street system; and 2 of the proposed lots will access SW Brookman Road to the northeast via a shared driveway. This northeastern access, identified Intersection 5 in the Transportation Impact Analysis (TIA) dated November 10, 2021, is the subject of this request. A separate design exception request was submitted for driveway access on an arterial roadway.

As a result of the location of the existing Cedar Creek alignment, wetlands, vegetated corridor, 100-year floodplain, and existing development patterns, this northeastern portion of the site (Proposed Lots 40 and 41) has no alternative access other than that which is proposed to SW Brookman Road. While the terminus of SW Redfern Place abuts this portion of the site, the adopted Brookman Addition Concept Plan identifies Redfern Drive as an area of special concern, appropriate for bicycle, pedestrian, and emergency access only due to the constraint of the existing street design. The 2020 Addendum to the Brookman Addition Concept Plan did not alter this access restriction.

As shown in Exhibit C: Sheet P3.0, Preliminary Plat, the subject driveway is located at a curve in SW Brookman Road where the roadway alignment changes from a north-south orientation to an east-west orientation. Sight distance for the movements exiting this shared driveway was addressed in the TIA and found to be adequate. For the proposed northbound left-turn movement into the driveway, the roadway curvature limits the view of oncoming traffic in the opposing direction (westbound), as shown in Figure 1. Thus, we are requesting that the stopping sight distance standard from the current AASHTO manual be applied for this movement rather than the intersectional sight distance standard detailed in Section 501.8.5.F of the Washington County Community Development Code (CDC).

Figure 1: Sight Lines for Northbound Approach to Proposed Site Driveway

Comparison

Existing Standard

The existing standard for sight distance in CDC Section 501.8.5.F.4 states that "minimum intersectional sight distance shall be equal to ten times the vehicular speed of the road." It shall be measured based on an "eye height of 3.5 feet and an object height of 4.25 feet above the road." Since this movement is for a left-turn movement into a driveway, the measurement is taken from the driver's eye as positioned in a vehicle in the travel lane rather than measured at 15 feet from the edge of the roadway.

CDC Section 501.8.5.F.2 specifies that the vehicular speed used in the calculation shall be the greater of the design speed, posted speed, or 85th percentile speed. The design speed of the roadway is unknown. The posted speed is 25 mph with advisory signage for 15 mph through the curve for vehicles traveling in the westbound to southbound direction. A speed study was conducted on June 16 and 17, 2022, on SW Brookman Avenue approximately 170 east of the proposed driveway. The study found the 85th percentile speed for vehicles traveling westbound at that location was 27 mph (see Exhibit D: Speed Study, attached).

The recommended approaching vehicular speed to be used in the subject sight distance calculation is 25 mph for several reasons. First, the vehicles must decelerate to travel through the curve. Field observations indicate that drivers negotiate the curve carefully, staying in lane since they cannot see around the corner. However, they are traveling more quickly than 15 mph. The curve can be driven with reasonable comfort at 20 mph but at 25 mph, centripetal forces cause noticeable discomfort. Most vehicles are estimated to travel at speeds closer to 20 mph through the corner. Second, the speed data was collected at a location where vehicles are beginning to decelerate for the curve; their speed is already slowing, and drivers are ready to apply their brakes as they anticipate possible vehicles approaching from the opposite direction and around the curve. When these factors are considered, the 85th percentile speed of vehicles as they near the corner is estimated to be 25 mph or less

Based on an approaching vehicular speed of 25 mph, the intersection sight distance per the CDC is calculated at 250 feet. This distance is not achievable for the northbound approach

Proposed Standard

One of the criteria in CDC 501.8.5.F.7, which documents the requirements for a design exception is that the sight distance proposed in the exception reference nationally accepted standards. According to the AASHTO manual, "*if the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions.*" Stopping sight distance is considered the minimum requirement to ensure safe operation of the driveway. This distance allows the driver of a vehicle traveling on the major-street to react to a turning vehicle, or other object in the roadway, and come to a complete stop, if necessary, to avoid a collision. This is proposed standard to be applied for the northbound left-turn movement into the proposed shared driveway.

For an approaching vehicular speed of 25 mph, the stopping sight distance per AASHTO is calculated at 155 feet. This distance is achievable for the northbound approach as documented in the following section.

Documentation

Roadway Characteristics

Although SW Brookman Road is currently designated with an arterial functional classification in both the 2019 Washington County Transportation System Plan (TSP) and 2014 City of Sherwood TSP, it does not have many of the characteristics of an arterial roadway. The roadway is narrow, with one travel lane in each direction and no shoulders, bike lanes, curbs, or sidewalks. On the subject segment of roadway, the posted speed is 25 mph whereas the Washington County design speed is 45 mph for arterial roadways and most have a posted speed of at least 35 mph.

Arterial roadways are designed to carry at least 15,000 vehicles per day for a three-lane cross section and 30,000 vehicles per day for a five-lane cross-section. Applying the standard assumption that daily volumes are approximately 10 times the evening peak hour volume, an estimated 2,000 vehicles per day will be traveling the segment of SW Brookman Road in 2024 after the proposed project is completed (see Exhibit E: Figure 7, Year 2024 Buildout Conditions Traffic Volumes, Cedar Creek Gardens TIA, attached). This forecast is substantially below the demand expected on an arterial road.

Ultimately, this segment of SW Brookman Road is planned to become a local street with implementation of the 2009 Brookman Addition Concept Plan. In the plan, the east-west section of SW Brookman Road as it extends eastward from OR 99W would connect more directly with SW Ladd Hill Road (see Exhibit F, attached). The remaining sections of SW Brookman Road, including the subject section, would become local streets. With these changes, traffic volumes on the subject section are anticipated to be even lower than the 2024 forecast of 2,000 daily vehicles derived from the TIA.

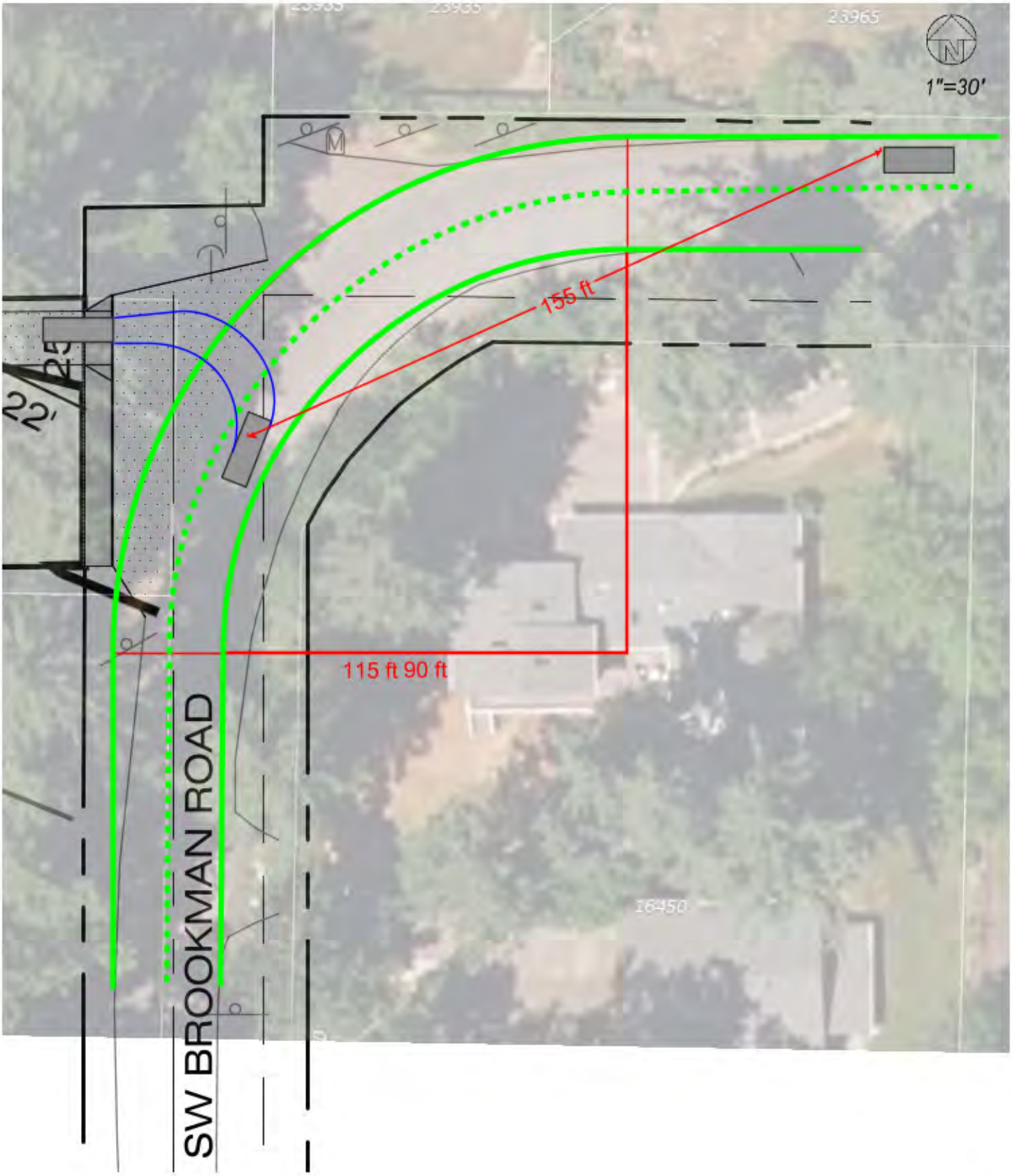
Anticipated Demand

The shared driveway is planned to serve two single-family homes. At the time the Cedar Creek Gardens TIA was prepared, three lots were to be served by the shared driveway. The TIA estimated two (2) vehicles would be using the shared driveway during both the morning and evening peak hours. The trip distribution for this driveway assumed to be 90 percent of traffic traveling to/from the northeast and 10 percent of the traffic traveling to/from the southwest. During the peak hours, the trip assignment shows no trips making the northbound left-turn movement into the driveway (see Exhibit G: Figures 3 and 4, Trip Distribution and Assignment, Cedar Creek Gardens TIA, attached). Over the course of a day, an estimated 10 trips would enter the driveway with one (1) trip making a northbound left-turn movement.

Sight Distance Measurement

To obtain the needed stopping sight distance of 155 feet, several improvements will be required as shown in Figure 2. These improvements include:

- Increasing the corner radius by widening the roadway to the west and north and restriping the travel lanes. This improvement will shift the turning vehicle to the west and increase the available sight lines.
- Clearing the sight triangle by pruning overhanging tree branches along the fence of the southeast property and restricting the height of the ground cover growing along the shoulder.



lancaster mobley

SIGHT DISTANCE
NORTHBOUND LEFT TURN

Figure 2
Cedar Creek Gardens
6/23/2022

Public Safety

With the recommended changes, the national standard for stopping sight distance at the driveway will be met. Demand for this movement is estimated at one (1) vehicle per day. Additionally, the traffic volumes on SW Brookman Road are forecast at approximately 2,000 vehicles per day with completion of this development and several other developments underway in the area. Thus, the potential for conflict at the shared driveway is very low.

Performance

The proposed design exception will not affect the performance of the roadway.

Financial Effect

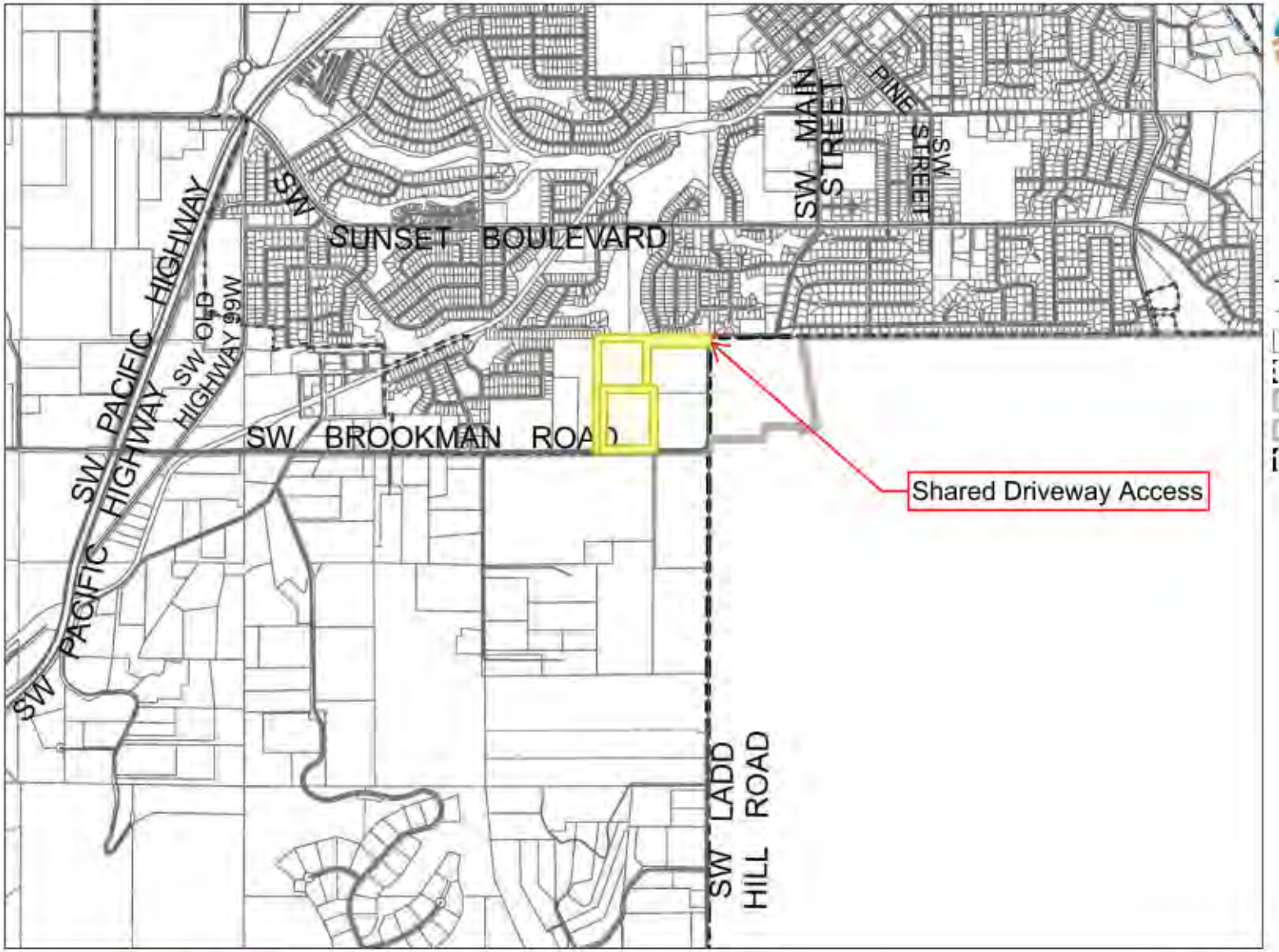
While the design exception would have no impacts for the public agencies, it would have financial repercussions for the abutting properties. To achieve the standard in the Washington County CDC would require significant realignment of SW Brookman Road, which would greatly impact the property on the southeast corner of the curve. Without the design exception, the two lots along the shared driveway could not be developed.

Attachments:

Exhibit A: Location Map
Exhibit B: Figure 4, Site Plan
Exhibit C: Sheet P3.0, Preliminary Plat
Exhibit D: Speed Study
Exhibit E: Figure 7, Year 2024 Buildout Conditions Traffic Volumes, Cedar Creek Gardens TIA
Exhibit F: Brookman Addition Concept Plan—Final Report, Figure 5 Functional Street Classification
Exhibit G: Figures 3 and 4, Trip Distribution and Assignment, Cedar Creek Gardens TIA

Exhibit A: Location Map

Exhibit A31



WASHINGTON COUNTY
OREGON

Map Title

- Street Names
- Arterials
- All Streets
- Parcels
- City Limits
- Regional Urban Growth Boundary
- Non-Regional Urban Growth Boundaries
- Washington County Boundary

1: 31,680

1 inch = 2,640 feet

0 660 2,640 5,280 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

Notes

1/5/2022

www.co.washington.or.us

Exhibit B: Figure 4, Site Plan

- Vegetated Corridor Boundary
- Sensitive Area
- VC Permanant Impacts: 26,439 SF
  - Mitigated Onsite: 25,451 SF
  - Not Mitigated: 889 SF (Trail), 99 SF (WQ Outfall)
- VC Mitigation: 29,470 SF 1:1.16 ratio
  - 53 Trees & 669 Shrubs
- Wetland Permanent Impacts: 6,567 SF
- VC Temporary Impacts: 920 SF
  - 46 Shrubs
- VC Enhancement: 144,884 SF
  - Good: 117,528 SF, Invasive plant removal & planting of all cleared areas >25 SF due to plant removal or grading
  - Marginal: 27,356 SF, 140 Trees & 1,368 Shrubs

CWS File No. 19-002989

- VC to Remain in Good Condition: 32,222 SF
- VC Temporary Impact: 6,185 SF

Fig. 4c
Fig. 4b
Fig. 4a

Fig. 4

Base Map Source: Pioneer Design Group, Inc.
Mod. By: KR
Date: 10/21
Job: 21004
Rev: 12/21

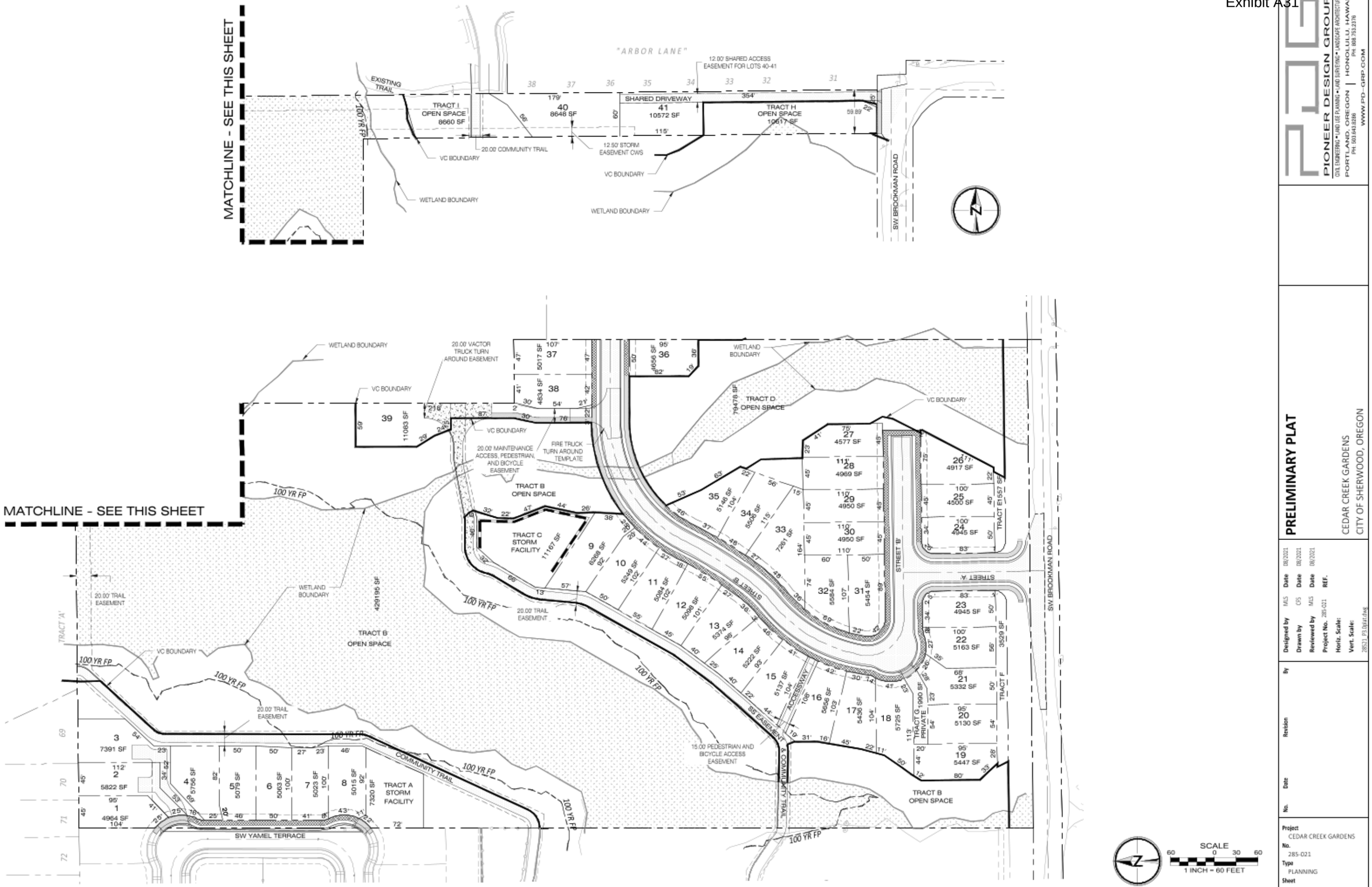
N
1"=140'
0 75 140

Site Plan
Cedar Creek Gardens
Sherwood, Oregon

Environmental Science & Assessment, LLC
4831 NE Fremont St., Suite 2B
Portland, OR 97213
Phone: 503.478.0424
www.esapdx.com

Exhibit C: Sheet P3.0, Preliminary Plat

Exhibit A31



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PH: 503.643.3186 PH: 808.793.2276
WWW.PD-GRP.COM

PRELIMINARY PLAT

CEDAR CREEK GARDENS
CITY OF SHERWOOD, OREGON

Designed by	MLS	Date	08/2021
Drawn by	CPS	Date	08/2021
Reviewed by	MLS	Date	08/2021
Project No.	285-021	REF.	
Horiz. Scale:			
Vert. Scale:			

28521_P3.0(plat).dwg

No.	Date	Revision	By

Project
CEDAR CREEK GARDENS
No.
285-021
Type
PLANNING
Sheet
P3.0

B:\Projects\285-021-19\Planning\28521_P3.0plat.dwg 1/4/2022 3:06:11 PM

Exhibit D: Speed Study

All Traffic Data Services, LLC
alltrafficdata.net

Date Start: 16-Jun-22
Date End: 17-Jun-22
SW Brookman Rd W-O SW Ladd Hill Rd
Site Code: 1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 9999	Total	85th Percent	95th Percent
06/16/22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	**5**	**6**	10	**11**	0	0	0	0	0	0	0	0	0	**32**	27	29
18:00	1	3	11	3	0	**1**	0	0	0	0	0	0	0	19	26	35
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21:00	0	1	4	6	1	0	0	0	0	0	0	0	0	12	29	31
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23:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	29	29
Total	9	16	45	31	2	2	0	0	0	0	0	0	0	105		
Percent	8.6%	15.2%	42.9%	29.5%	1.9%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																
PM Peak Vol.	17:00 5	17:00 6	20:00 12	17:00 11	20:00 1	18:00 1								17:00 32		

All Traffic Data Services, LLC
alltrafficdata.net

Date Start: 16-Jun-22
Date End: 17-Jun-22
SW Brookman Rd W-O SW Ladd Hill Rd
Site Code: 1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 9999	Total	85th Percent	95th Percent
06/17/22	0	0	1	0	**1**	0	0	0	0	0	0	0	0	2	33	34
01:00	0	1	0	1	0	0	0	0	0	0	0	0	0	2	28	29
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07:00	0	1	**11**	6	0	0	0	0	0	0	0	0	0	**18**	27	29
08:00	0	**6**	11	1	0	0	0	0	0	0	0	0	0	18	24	25
09:00	**2**	5	7	0	1	0	0	0	0	0	0	0	0	15	24	31
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11:00	1	3	9	4	1	0	0	0	0	0	0	0	0	18	27	30
12 PM	0	4	15	3	0	0	0	0	0	0	0	0	0	22	24	28
13:00	0	**7**	9	2	1	0	0	0	0	0	0	0	0	19	25	30
14:00	1	6	**19**	9	**2**	0	0	0	0	0	0	0	0	37	28	30
15:00	**3**	5	18	**14**	0	0	0	0	0	0	0	0	0	**40**	27	29
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18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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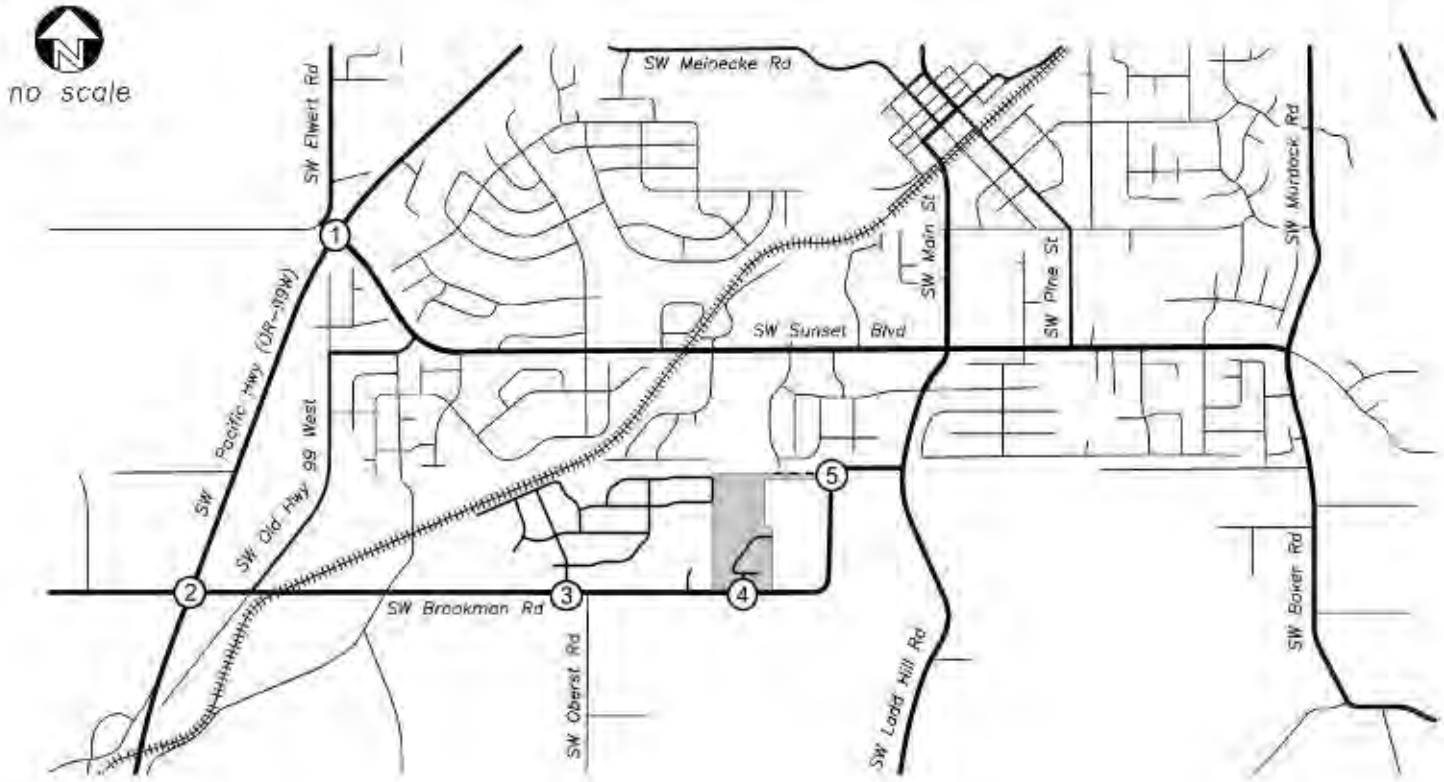
AM Peak	09:00	08:00	07:00	06:00	00:00	02:00								07:00		
Vol.	2	6	11	6	1	1								18		
PM Peak	15:00	13:00	14:00	15:00	14:00									15:00		
Vol.	3	7	19	14	2									40		
Grand Total	17	64	168	89	10	3	0	0	0	0	0	0	0	351		
Percent	4.8%	18.2%	47.9%	25.4%	2.8%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	17 MPH
50th Percentile :	22 MPH
85th Percentile :	27 MPH
95th Percentile :	29 MPH

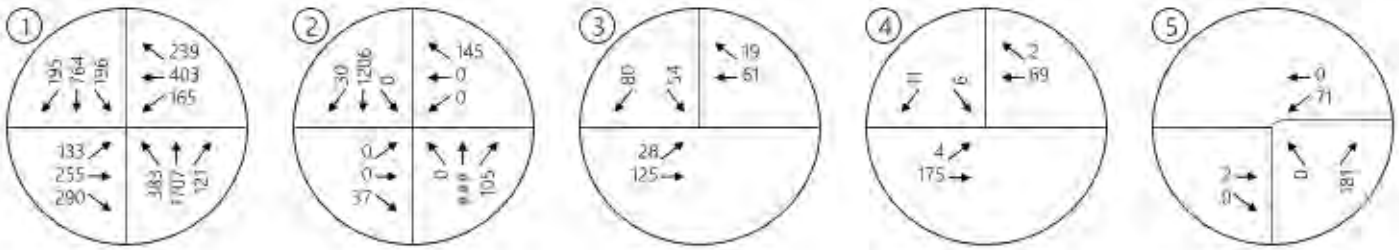
Stats

10 MPH Pace Speed :	21-30 MPH
Number in Pace :	257
Percent in Pace :	73.2%
Number of Vehicles > 55 MPH :	0
Percent of Vehicles > 55 MPH :	0.0%
Mean Speed(Average) :	23 MPH

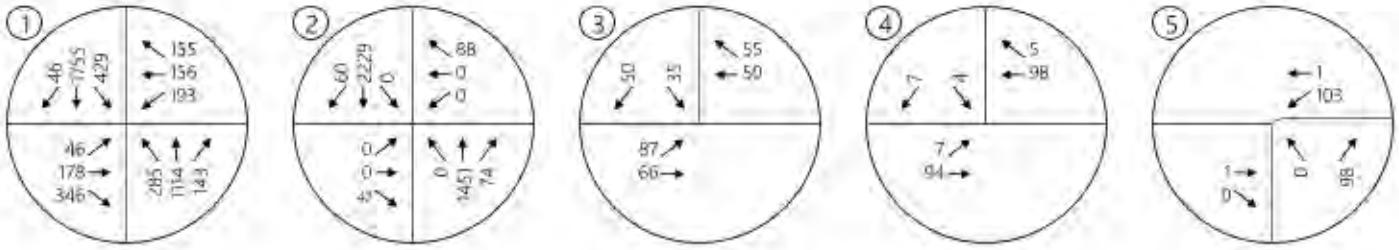
Exhibit E: Figure 7, Year 2024 Buildout Conditions Traffic Volumes, Cedar Creek Gardens TIA



AM PEAK HOUR



PM PEAK HOUR



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YEAR 2024 BUILDOUT CONDITIONS

TRAFFIC VOLUMES

Figure 7
Cedar Creek Gardens
11/2/2021

Exhibit F: Brookman Addition Concept Plan—Final Report. Figure 5 Functional Street Classification

Figure 5 Functional Street Classification

Brookman Addition Concept Plan

Functional Street Classification

Notes:
1. Existing Cemetery (Constrained Land)
2. Railroad Crossing (Grade Separated)
3. All street alignments are conceptual.
4. Redfern connection is pedestrian, bicycle and emergency access only.

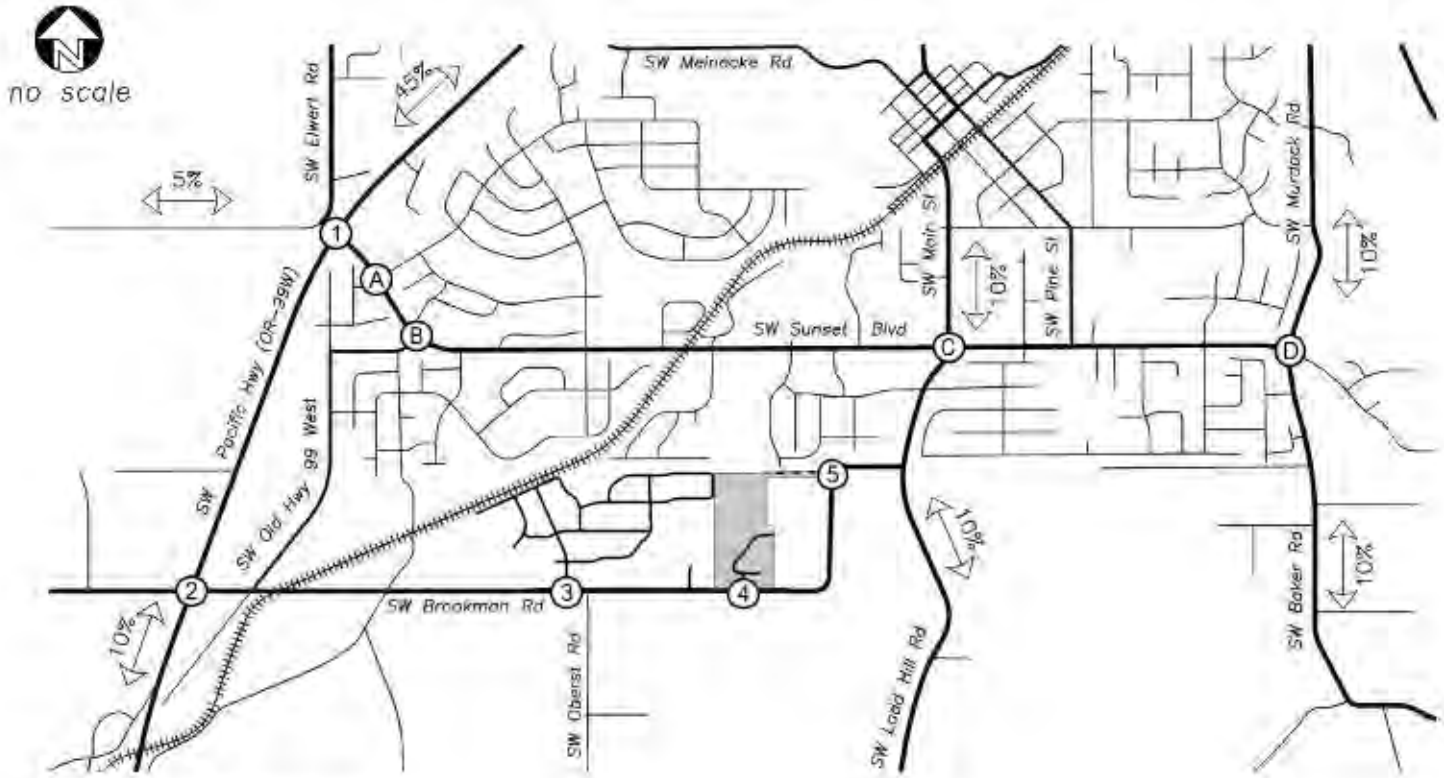
0' 250' 500' 1000'

Final-May 2008

Legend

- High Density Residential 24 du/ac
- Medium Density Residential- High 11 du/ac
- Medium Density Residential- Low 8 du/ac
- Commercial / Mixed Use
- Employment
- Neighborhood Parks (Locations are conceptual)
- Constrained Lands (Goal 5 resource lands, subject to on-site verification)
- Constrained Lands (Vegetated corridor proxy, subject to on-site verification)
- Constrained Lands (Potential wetlands, subject to on-site verification)
- Collector
- Neighborhood Roads

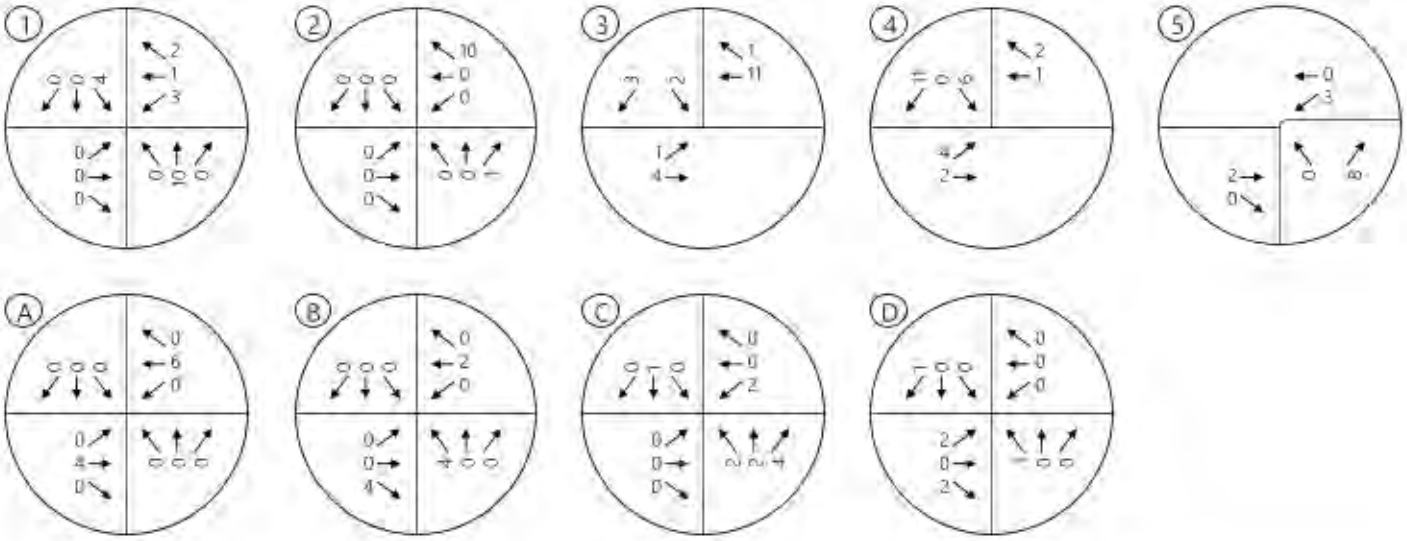
Exhibit G: Figures 3 and 4, Trip Distribution and Assignment, Cedar Creek Gardens TIA



NET TRIP GENERATION

	In	Out	Total
AM	8	24	32
PM	26	15	41
DAILY	213	213	426

AM PEAK HOUR



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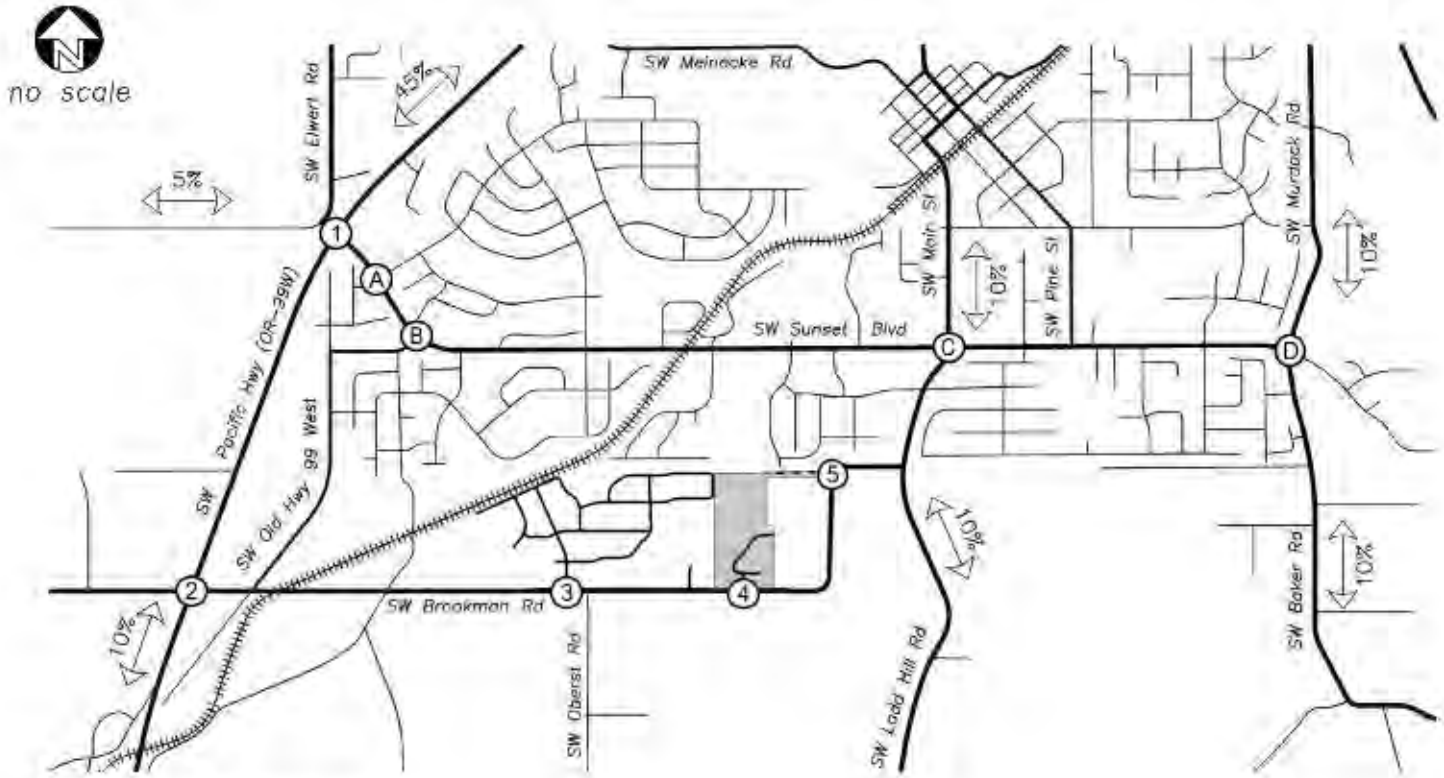
TRIP DISTRIBUTION & ASSIGNMENT - AM PEAK

TRAFFIC VOLUMES

Figure 3
Cedar Creek Gardens
11/10/2021



NET TRIP GENERATION

	In	Out	Total
AM	8	24	32
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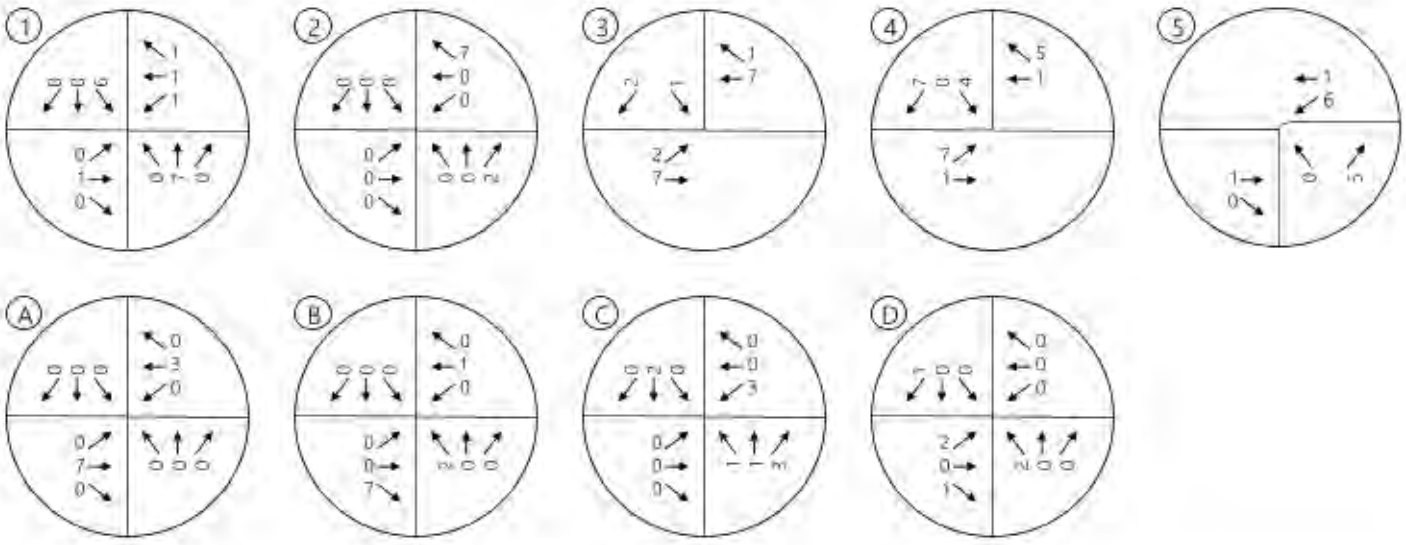
PM PEAK HOUR



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TRIP DISTRIBUTION & ASSIGNMENT - PM PEAK

TRAFFIC VOLUMES

Figure 4
Cedar Creek Gardens
11/10/2021

Exhibit A32

WASHINGTON COUNTY SURVEYOR'S OFFICE
ACCEPTED FOR FILING _____

RECORD OF SURVEY

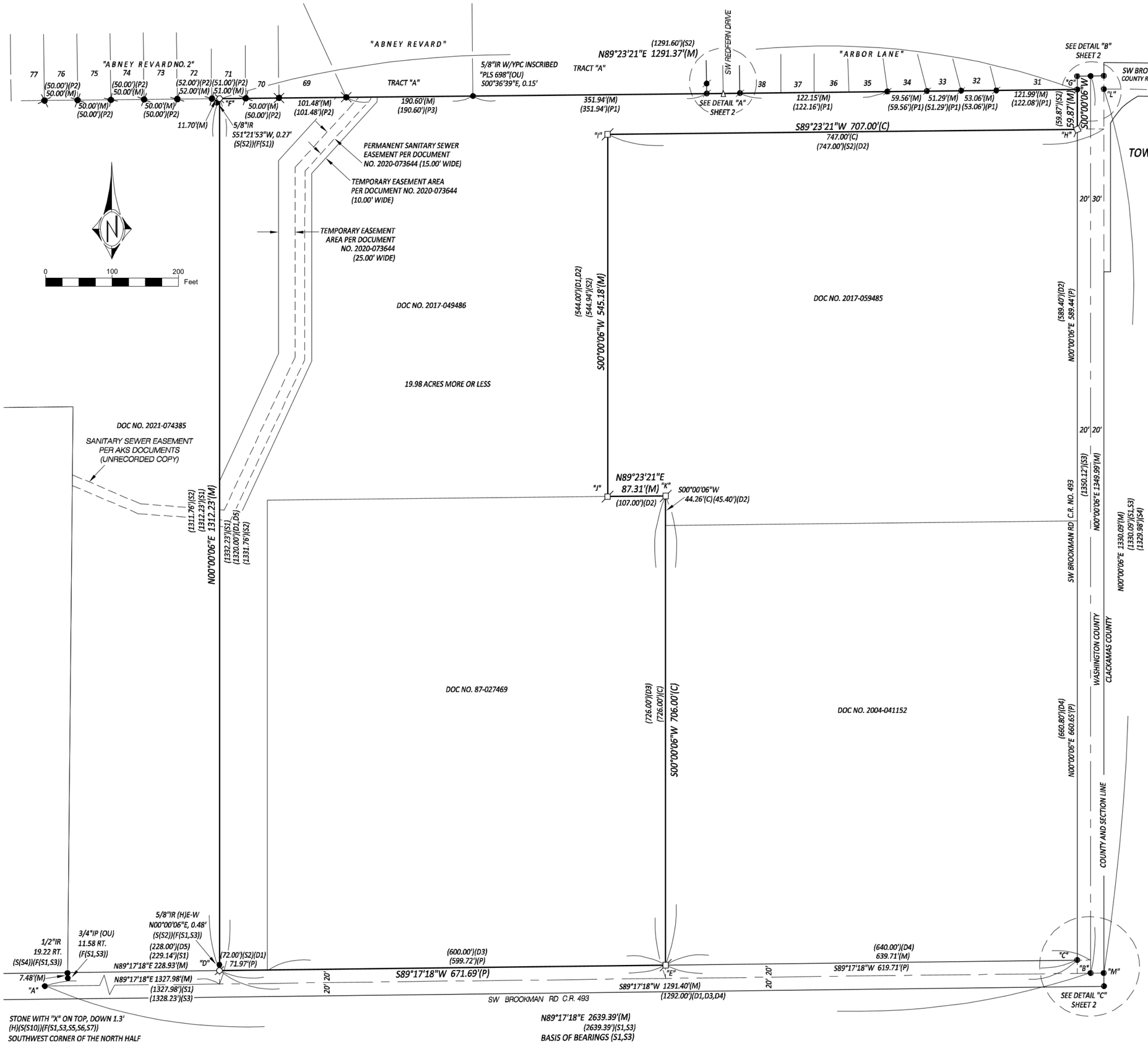
LOCATED IN THE NORTHEAST ONE-QUARTER OF SECTION 10, TOWNSHIP 1 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, WASHINGTON COUNTY, OREGON

PREPARED AT THE REQUEST OF WESTWOOD HOMES

DATE: JUNE 20, 2022

PIONEER DESIGN GROUP JOB NO. 285-021

SHEET 1 OF 2



LEGEND

- ● FOUND MONUMENT AS NOTED
- ● FOUND 5/8" IRON ROD W/YPC STAMPED "LAND DEV. CONSULTANTS" HELD OR AS NOTED (S(P1))
- △ FOUND 5/8" IRON ROD WITH 1-1/2" ALUMINUM CAP STAMPED "LAND DEV. CONSULTANTS" HELD OR AS NOTED (S(P1))
- ⊗ FOUND 5/8" IRON ROD W/OPC STAMPED "CONSULTING ENGINEERING SERVICES" HELD OR AS NOTED (S(P2))
- ⌀ 5/8" IRON W/YPC STAMPED "PIONEER DESIGN" SET IN SN 33762 (S1)
- ⌀ SET 5/8" X 30" IRON ROD W/YPC STAMPED "PIONEER DESIGN" SET ON JUNE 27, 2022.

IR IRON ROD
IP IRON PIPE
W/YPC WITH YELLOW PLASTIC CAP
W/OPC WITH ORANGE PLASTIC CAP
SN SURVEY NUMBER, WASHINGTON COUNTY SURVEY RECORDS
(M) MEASURED
(H) HELD
(C) CALCULATED
(OU) ORIGIN UNKNOWN
(P) PROPORTION
(F)( ) FOUND BY REFERENCE
(S)( ) SET BY REFERENCE
"A" MONUMENT AND CORNER REFERENCE
E-W EAST-WEST
DOC NO. DOCUMENT NO.
C.R. COUNTY ROAD

WASHINGTON COUNTY RECORDS REFERENCED

PLAT RECORDS

PLATS: ARBOR LANE (P1), ABNEY REVARD NO. 2 (P2), ABNEY REVARD (P3)

SURVEY RECORDS

SURVEYS: SN 33762 (S1), SN 23506 (S2), SN 33327 (S3), SN 16296 (S4), SN 33735 (S5), SN 33843 (S6), SN 26048 (S7), SN 4002 (S8), USBT ENTRY 2002-002 (S9), SN 1561 (S10), SN 22875 (S11)

DEED RECORDS

DEEDS: DOC NO. 2017-049486 (D1), DOC NO. 2017-059485 (D2), DOC NO. 87027469 (D3), DOC NO. 2004-041152 (D4), DOC NO. 2021-074385 (D5)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JULY 11, 2017
DONALD SCOTT SORENSON
60310

EXPIRES: 6-30-24

PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQUARE RD
SUITE 170
PORTLAND, OREGON 97223
p 503.643.8286
www.pd-grp.com