Traffic Impact Analysis

Project Shakespeare

Prepared for Trammell Crow Company

REGISTERED PROFESSIONAL ENGINEER
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DKS

Shaping a Smarter Transportation Experience™

TRAFFIC IMPACT ANALYSIS FOR PROJECT SHAKESPEARE

Canby, Oregon

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INTRODUCTION

This study evaluates the transportation impacts for Project Shakespeare, a warehouse beverage distribution facility, located within the Pioneer Industrial Park in Canby, Oregon. The anticipated year of opening for the proposed facility is 2020. The study includes an evaluation of existing transportation conditions, trip generation and distribution, and future transportation conditions. The study also summarizes the nature and intensity of nearby pedestrian and bicycle facilities and activity, current or planned transit routes, and safety review of existing intersection facilities. The purpose of the report is to identify and address key transportation issues within the study area due to the proposed facility.

Project Description

Project Shakespeare will consolidate three existing distribution facilities within the Portland metro area to build a proposed single facility on the eastern edge of Canby's city limits. The proposed facility is a 514.5 ksf warehouse, which includes supporting office space. The site (**Figure 1**), within the Pioneer Industrial Park, is zoned as Light Industrial, and is bordered by South Mulino Road along the east, SE 1st Avenue to the north and South Walnut Road to the west. The site would have access from SE 1st Avenue.

Study Scenarios

This analysis addresses traffic conditions at eight study intersections during the AM (7:00 – 9:00) and PM (4:00 – 6:00) peak periods for a typical weekday. Traffic operations at each study intersection were analyzed for the following scenarios:

- 2018 Existing Conditions during the weekday AM and PM peak hours
- 2020 Background Traffic Conditions (without the project) during the weekday AM and PM peak hours
- 2020 Build Conditions (with the project) during the weekday AM and PM peak hours
    - A sensitivity analysis was performed for the 2020 Build Conditions with the extension of Hazeldell Way connecting to OR 99E

EXISTING CONDITIONS

This section includes a description of the study area roadway network, existing motor vehicle volumes, existing traffic operations, and safety analysis.

Study Area Roadway Network

There are eight key roadways within the study area. Roadway functional classifications and other important roadway characteristics are listed in **Table 1**. The locations of the study roadways and study intersections are shown in **Figure 1**.

Figure 1: Locations of Study Area Roadways and Intersections

SE 1st Avenue is a two-lane east-west street that provides the main access on the north boundary of the project site. It currently ends just east of Sequoia Parkway and continues east to where it becomes S Haines Road between S Mulino Road and S Bremer Road. It currently has three-leg intersections with SE Hazeldell Way, S Walnut Road, S Mulino Road, and S Bremer Road. There are single family residences along the north side of the roadway and the south side of the roadway is generally vacant.

SE Mulino Road is a two-lane north-south roadway that begins at a three-leg intersection with SE 1st Avenue/ S Haines Road and travels south along the eastern edge of the City of Canby. Its frontage is primarily vacant or farm properties on both sides.

S Walnut Road is a narrow two-lane north-south roadway that forms the western boundary of the project site. It is approximately 18 feet wide from its northern terminus with SE 1st Avenue to approximately 1600 feet south where recent upgrades have improved the roadway to its intersection with Sequoia Parkway.

Sequoia Parkway is a two to four-lane roadway that begins at its four-leg intersection with Oregon Highway 99E (OR 99E) and travels south and east through the eastern portion of the City of Canby. It provides access to much of the commercial and industrial/warehousing development in the vicinity of the project site, including primary access to the nearby shopping center.

S Haines Road is a two-lane north-south roadway outside of the city limits that begins at the end of SE 1st Avenue and continues north to its three-leg intersection with OR 99E, approximately 1.3 miles to the north. There are single family residences along the west side of the road and some homes and farm properties on the east side of the road.

Oregon Highway 99E is the primary north-south regional connection to the City of Canby. To the north, OR 99E connects to the Portland metro area, while to the south, OR 99E connects to the Salem area. In the vicinity of the project side, OR 99E is a four-lane highway with signalized intersections at Sequoia Parkway/N Redwood Street and NE/SE Territorial Road and a three-leg unsignalized intersection with Haines Road.

Interstate 5 is not in the vicinity of the proposed project site but is important because it will provide long distance connections to points north and south within the state of Oregon. Primary access to I-5 is provided by NW Territorial Road, S Barlow Road, Knights Bridge Road, Arndt Road, and the Portland-Hubbard Highway. Based on the nature of these roadways (curvature, width, sight distances, trees), it is assumed that a large percentage of trucks entering and exiting the site would travel south from the site on OR 99E and use S Barlow Road to access I-5 to points north and south.

Table 1: Study Area Roadway Characteristics

Roadway	Functional Classification [a]	Auto Lanes	Posted Speed [b]	Sidewalks	Bike Lanes	On-Street Parking
Oregon 99E	Highway	4	45	No	Yes	No
N Redwood Street	Collector	2	25	Yes	Yes	Yes
Sequoia Parkway	Collector	2-4	25-30	Yes	Yes	No
SE Hazeldell Way	Collector	2	25	Yes	Yes	No
SE 1st Avenue	Collector	2	25 [c]	No	No	No
S Walnut Road	Other Roadway (Local)	2	25 [c]	No	No	No
S Mulino Road	Collector	2	25 [c]	No	No	No
S Haines Road	Collector	2	25 [c]	No	No	No

[a] City of Canby Transportation System Plan (TSP), December 2010.
[b] Posted speed within the study area.
[c] Not posted, but assumed to be 25 mph

Multimodal Facilities

The following section summarizes the existing multimodal network.

Pedestrian and Bicycle Facilities

The study area roadways adjacent to OR 99E (Sequoia Parkway, Hazeldell Way, and Redwood Street) all have bicycle lanes and sidewalk facilities. Roadways further away from OR 99E and closer to the project site (SE 1st Avenue, S Walnut Road, S Mulino Road, and S Haines Road) do not have bicycle lanes or sidewalk facilities. OR 99E only has sidewalk facilities at its major intersections and has striped shoulders that are not identified as bicycle lanes.

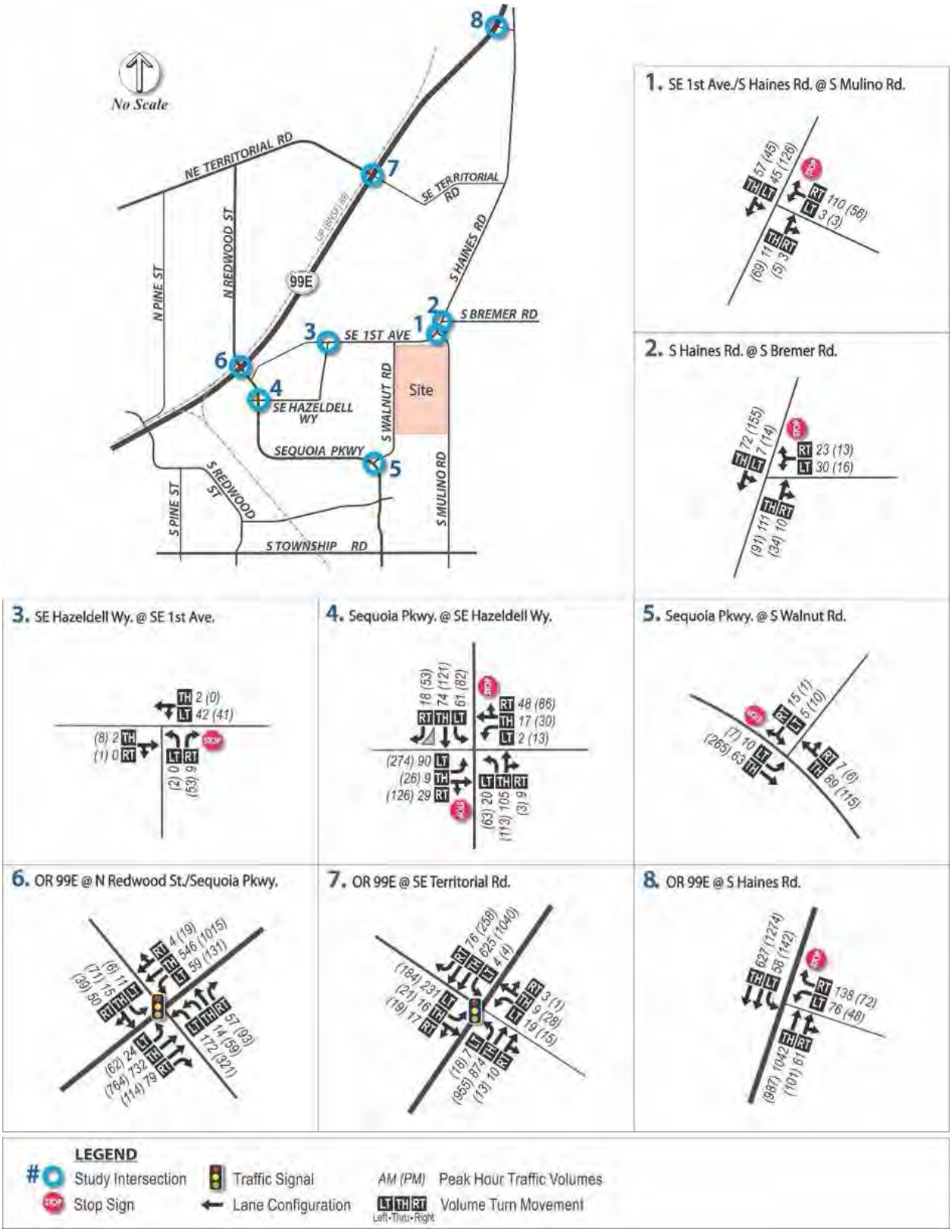
Transit

Canby Area Transit (CAT) provides fixed route bus and Dial-A-Ride service within the study area. There is one fixed route (Route 99X) that provides commuter service to Oregon City and Woodburn via the Canby Transit Center. Several bus stops are located along OR 99E though Canby. The nearest stops to the project site are located near Territorial Road and near Redwood Street.

Existing Motor Vehicle Traffic Volumes

To determine existing intersection traffic operations, weekday AM and PM peak period traffic counts were collected. The raw traffic data is included in Appendix B. Traffic counts were collected on August 23, 2018 and October 4, 2018. Volume disparities between intersections were balanced to account for the variance between the two count dates. These balanced weekday peak hour volumes are shown in **Figure 2**.

Figure 2: 2018 Existing Conditions Weekday AM/PM Peak Hour Traffic Volumes



Existing Intersection Operations

Existing intersection operations analysis was performed for the eight study area intersections to establish baseline conditions. Intersections are the focus of the analysis because they are the controlling bottlenecks of traffic flow and because the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinity. Descriptions of the intersection performance measures, jurisdictional mobility targets, and existing traffic operational analysis are provided in the following sections.

Intersection Performance Measures

Level of service (LOS) ratings and volume-to-capacity (v/c) ratios are two commonly used performance measures that provide a good picture of intersection operations.

- **Level of service (LOS):** A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity.
- **Volume-to-capacity (v/c) ratio:** A decimal representation (typically between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases, and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

Required Mobility Targets/Standards

All study intersections must comply with adopted mobility targets/standards or modifications may be necessary to serve future growth. Intersection performance measures used for mobility targets/standards vary by roadway jurisdiction. The study intersections under ODOT jurisdiction must comply with the v/c ratio targets in the Oregon Highway Plan (OHP), which specifies a v/c ratio target of 0.85 or less for the intersections along OR 99E. The study intersections under City of Canby jurisdiction must comply with the LOS standards in the City's Transportation System Plan (TSP), which requires a LOS E and a v/c ratio of 0.90 or better for city-owned stop-controlled intersections. The study intersections under Clackamas County jurisdiction must comply with the County's Roadway Standards, which requires a v/c ratio of 0.95 or less for stop-controlled intersections.

Existing Operating Conditions

The existing traffic operations at the study intersections were analyzed for the weekday AM and PM peak hours using the 2000 Highway Capacity Manual (HCM) methodology for signalized intersections and the 2010 Highway Capacity Manual methodology for unsignalized intersections. The level of service and volume-to-capacity ratio of each study intersection is listed in **Table 2**.

Based on exiting traffic volumes, two stop-controlled study intersections do not currently meet the mobility standards: Sequoia Parkway/Hazeldell Way and OR 99E/Haines Road. At Sequoia Parkway/Hazeldell Way, there is a heavy eastbound left turn movement exiting the shopping center during the PM peak that experiences a high level of delay due to the conflicting traffic flows on the northbound and southbound approaches.

Similarly, at OR 99E/Haines Road, moderate left turn traffic conflicts with heavy northbound and southbound approaches on OR 99E. The analysis indicates that v/c > 1.0. However, since existing volumes were measured in the field conditions, the actual volume cannot exceed capacity and the conditions are overstated. Potential causes for this phenomena may include that stopped vehicles are accepting shorter gaps, or the arrival patterns of traffic on OR 99E (due to the traffic signal at Territorial Road or the single approach lane on OR 99E to the north) are metered or platooned. HCM methodology breaks down at delay values greater than 300 seconds, so ">300" is reported for excessively high delay movements.

Table 2: 2018 Existing AM and PM Peak Hour Study Intersection Operations

Intersection	Mobility Targets/ Standards	AM Peak Hour			PM Peak Hour		
		Delay	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*
Signalized							
OR 99 E & Sequoia Parkway/Redwood Street	0.85 V/C	18.4	B	0.46	29.6	C	0.66
OR 99 E & Territorial Road	0.85 V/C	14.7	B	0.62	12.7	B	0.58
Unsignalized							
Mulino Road & SE 1st Avenue	0.95 V/C	8.9	A/A	0.13	9.1	A/A	0.10
SE 1st Avenue/Haines Road & Bremer Road	0.95 V/C	9.8	A/A	0.07	10.1	A/B	0.04
Hazeldell Way & SE 1st Avenue	LOS E 0.90 V/C	8.4	A/A	0.03	8.5	A/A	0.06
Sequoia Parkway & Hazeldell Way	LOS E 0.90 V/C	13.5	A/B	0.22	**51.9**	**A/F**	**0.94**
Sequoia Parkway & Walnut Road	LOS E 0.90 V/C	9.3	A/A	0.03	10.9	A/B	0.02
OR 99 E & Haines Road	0.85 V/C	**>300**	**A/F**	**1.38[a]**	**>300**	**A/F**	**1.35[a]**

Bolded Red values do not meet mobility targets/standards.

Two-Way-Stop Controlled Intersections:
- Delay = Average Intersection Delay (sec.) of Worst Approach
- LOS = Level of Service of Major Street/Minor Street (i.e., A/F) of Worst Approach
- v/c = Volume-to-Capacity Ratio of Worst Movement

All-Way Stop Controlled Intersections:
- LOS & Delay = Reported for Entire Intersection
- v/c = Volume-to-Capacity Ratio of Worst Movement

[a] See narrative preceding Table 2 for note regarding existing v/c > 1.0. Conditions are overstated, and actual v/c is lower than reported.

Crash Analysis

The most recent three years (2014-2016) of available crash data for the study area was obtained from ODOT and was used to evaluate the crash history. The individual crash types at study area intersections were examined to see if any patterns are present at locations that exceed typical crash rates. **Table 3** lists the collision types and severities experienced by total crashes. There were no reported fatalities at the study intersections during the analysis period. There were no reported crashes at five of the study

intersections, as noted in **Table 3**. Only one intersection not located on OR 99E (Sequoia Parkway/ Hazeldell Way) had any reported crashes (3) over the last three years.

The total number of crashes experienced at an intersection is typically proportional to the number of vehicles entering it. Therefore, a crash rate describing the frequency of crashes per million entering vehicles (MEV) is used to evaluate the intersection. The observed crash rate is compared to the critical crash rate, which is unique to each intersection and is a factor of crash rates at similar sites within the study area, traffic volume, and a statistical confidence level. Intersections with an observed crash rate greater than the critical crash rate typically warrant further review. The crash rates calculated (based on the past three years of collision data) for the study intersections are shown in **Table 3**. None of the study intersections had an observed crash rate higher than the critical crash rate.

Table 3: Intersection Collision Summary (2014-2016)

Intersection Crashes	Total	Collision Severity		Collision Type				Observed Crash Rate [b]	Critical Crash Rate [c]
		Minor Injury	*PDO[a]*	*Angle*	*Turn*	*Rear*	*Fixed Object*		
SE 1st Avenue/ S Mulino Road	0	0	0	0	0	0	0	0.00	1.04
SE 1st Avenue/ S Bremer Road	0	0	0	0	0	0	0	0.00	1.01
SE 1st Avenue/ SE Hazeldell Way	0	0	0	0	0	0	0	0.00	1.84
Sequoia Parkway/ SE Hazeldell Way	3	1	2	1	2	0	0	0.33	0.73
Sequoia Parkway/ S Walnut Way	0	0	0	0	0	0	0	0.00	0.14
OR 99E / N Redwood St/ Sequoia Parkway	11	7	4	0	5	5	1	0.41	0.51
OR 99E/ NE Territorial Road	6	4	2	0	3	3	0	0.22	0.51
OR 99E/ Haines Road	13	9	4	0	11	2	0	0.46	0.55
SE 1st Avenue/ Walnut Road	0	0	0	0	0	0	0	0.00	1.65

[a] Property Damage Only
[b] Observed crash rate calculated per million entering vehicles.
[c] Critical crash rate calculated per million entering vehicles based on 95 percent confidence level.

Community members at the neighborhood meeting for the project (October 10, 2018) cited concerns about crashes and safety on Haines Road. For this reason, additional exploration into the crash data was performed to ensure that other crashes were not overlooked. This review along SE 1st Avenue and Haines Road indicated that:

- No crashes occurred along the corridor in 2012.
- One injury crash occurred at the intersection of SE 1st Avenue / S Bremer Road in 2013 (the only identified crash along this segment or roadway in the five-year period of 2012 to 2016).
- No additional crashes occurred along the corridor near the intersection that were not included with the prior intersection lists.

ODOT Safety Priority Index System

The crash analysis was further supplemented by a review of ODOT Safety Priority Index System (SPIS) listings for locations in the study area that ranked among the state's top 10% of hazardous locations. The SPIS is a method developed by ODOT for identifying hazardous locations on state highways, with the score based on three years of crash data, considering crash frequency, rate, and severity. ODOT bases its SPIS on 0.10-mile segments to account for variances in how crash locations are reported. This rating provides a general comparison of the overall safety of the highway based on crash information for all highway segments throughout the state. The most recent SPIS list indicates that there are no sites within the study area that rank among the top 10% of SPIS sites.

IMPACT ANALYSIS

This section summarizes the proposed site and impacts to the transportation system.

Project Description

The proposed warehouse/ distribution center development is located on a parcel bounded by SE 1st Avenue to the north, S Walnut Road to the west, and S Mulino Road to the east. There is no roadway frontage on the southern boundary of the project site. Employee and visitor vehicles (light duty) would access the site via two driveways on SE 1st Avenue and trucks used for distribution would access the site via a separated third driveway on SE 1st Avenue. The truck access driveway would be the furthest west driveway while the passenger vehicle access would be provided at the central and eastern most driveways. The initial building would provide approximately 520 ksf of warehouse space, with the potential for future expansion (up to approximately 740 ksf). For the purposes of this study, the site is assumed to be built out to the full potential size (740 ksf) to determine worst-case traffic impacts.

Trip Generation

ITE trip generation data was used to estimate vehicles trips for the site, based on national trip generation surveys. The Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition (2017) introduced a new category, High Cube Cold Storage Warehouse (ITE Code 157), that fits the proposed Shakespeare development (beverage distribution). Prior versions of ITE Trip Generation did not include this updated category and under the previous description for other distribution categories cautioned about using the data due to potential operational variability of uses. While the new ITE category 157 fits the Project Shakespeare site description, DKS collected trip generation data from a similar facility in the region to confirm the trip generation. After adjusting for operational differences between the existing use and proposed site, the trip generation rates published in ITE for Land Use 157 (High Cube Cold Storage Warehouse) were confirmed to be appropriate for the proposed development.

The traffic counts conducted by DKS also included vehicle classification to distinguish between light duty vehicles (employees and visitors) and large trucks (product distribution). Those percentages (along with entering vs. exiting percentages) were applied to the ITE trip generation rates for ITE Code 157 and the resultant trip generation statistics used for the analysis are summarized in **Table 4**. The table indicates

that at a full potential expansion size of 740 ksf, the site would generate approximately 81 vehicle trips during the AM peak hour and approximately 89 vehicle trips during the PM peak hour.

Table 4: AM/PM Peak Hour Primary Trip Generation

ITE Code 157		Daily		AM Peak Hour		PM Peak Hour	
High Cube Cold Storage Warehouse (740.0 ksf)		*Rate*	*Trips*	*Rate*	*Trips*	*Rate*	*Trips*
All Vehicles	Total	2.12	1,569	0.11	81	0.12	89
	In	50%	784	56%	45	35%	31
	Out	50%	784	44%	36	65%	58
Light Vehicles	Total			43%	35	73%	65
	In				20		23
	Out				15		42
Trucks	Total			57%	46	27%	24
	In				26		8
	Out				20		16

Trip Distribution

The distribution of site-generated trips through the study intersections was estimated based on operational information provided by the project applicant and observations of local traffic patterns. In general, distribution of employee/ visitor trips and truck trips is estimated to be approximately 50% to the north (toward the Portland Metro area) and 50% to the south (toward Salem and other areas along the I-5 corridor and connections to the coast and central Oregon). The distribution varies for employees/ visitors and trucks, and routes assumed for each are different as well. **Figure 3** shows the assumed distributions and routing for employee/visitor and truck trips and **Figure 4** shows the combined volumes added by the project at study intersections.

For employees and visitors, the analysis assumes that approximately 25% of trips travel north on OR 99E and approximately 35% travel south on OR 99E. Of those traveling south on OR 99E, some would take Barlow Road towards I-5 (to head northbound or southbound) and some would take OR 99E south towards Salem. Approximately 15% would take Territorial Road through residential portions of Canby towards I-5 north and south. The remaining 25% are estimated to either remain within Canby or take local roadways to the south or east.

For trucks, it is assumed that very few (if any) would remain within Canby or take the minor roadways to the south and east. The majority of trucks would take the four available routes that provide regional connections to points north and south in Oregon. Approximately 25% are assumed to take OR 99E north toward the eastern portion of the Portland Metro area, while the remaining 75% are assumed to take various routes toward I-5 north and south. Based on roadway conditions (width of roadways, condition of pavement, tree canopy, and number of residential driveways) it is assumed that no trucks would use Haines Road, Territorial Road (east of OR 99E), Bremer Road, or Mulino Road. Truck access to the site from OR 99E would be provided via Sequoia Parkway to Hazeldell Way. The planned future connection of Hazeldell Way to OR 99E would provide a more direct connection for site trips to/from 99E for both employee and truck trips.

Figure 3: Project Trip Distribution

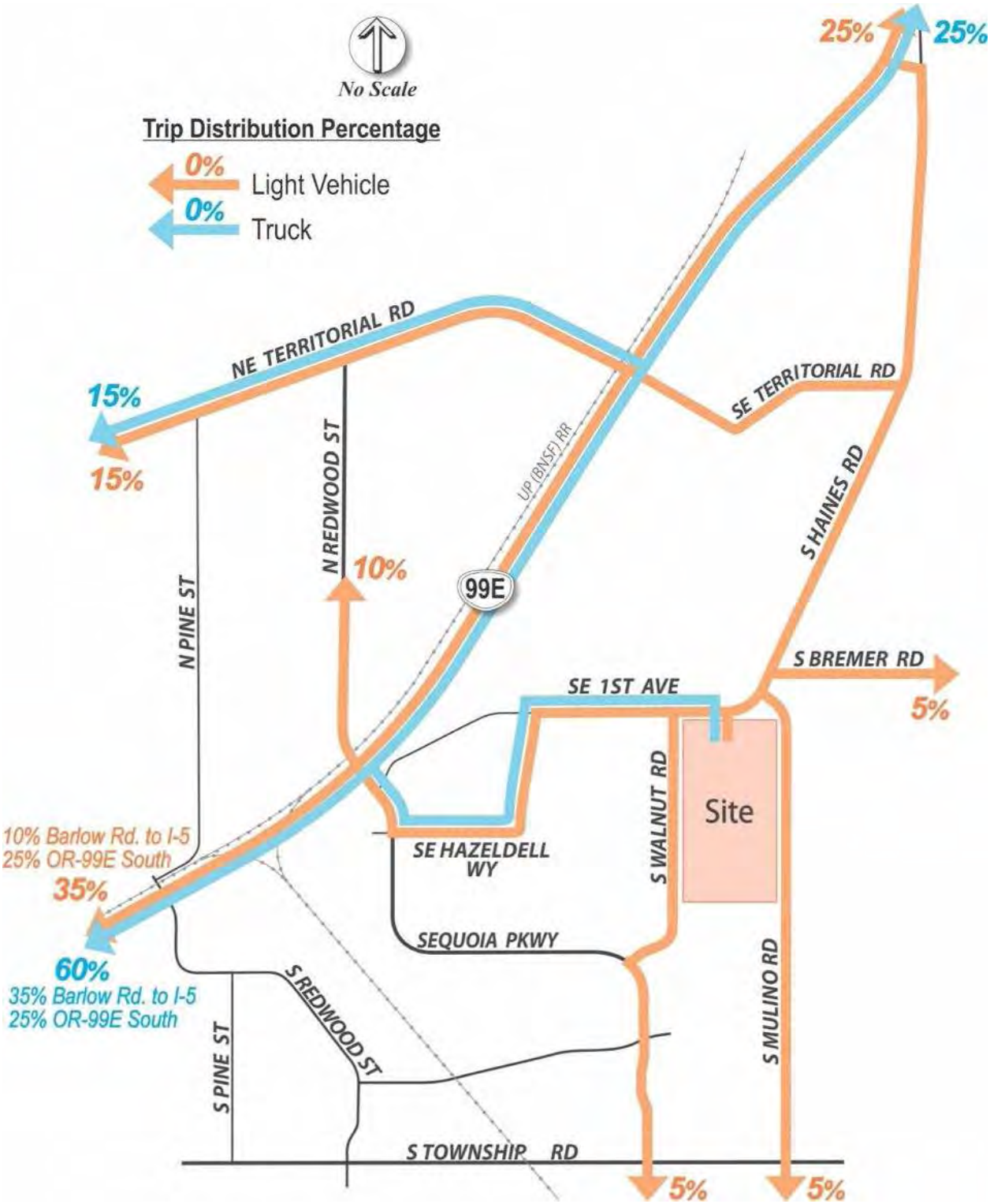
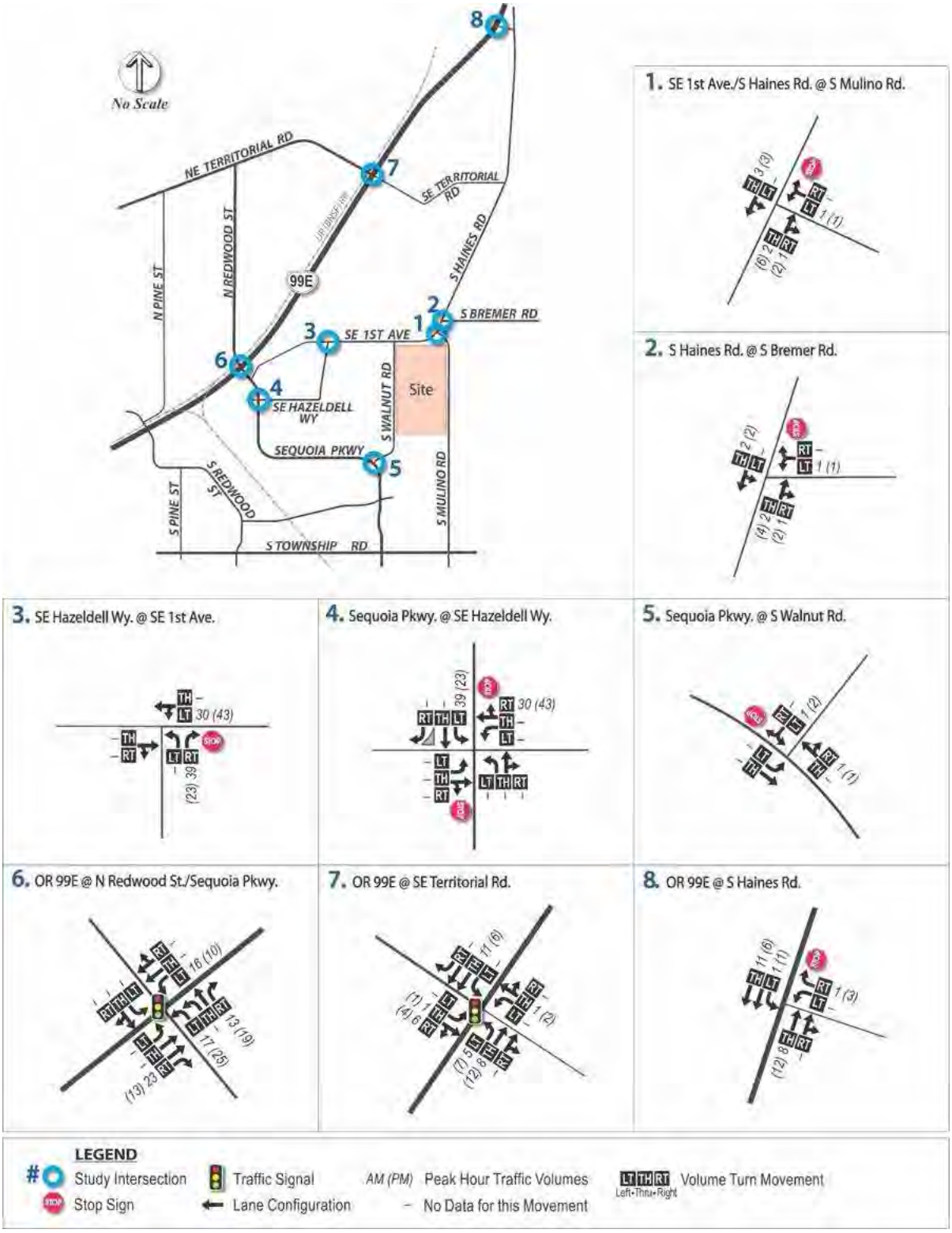


Figure 4: Project-Added Volumes at Study Intersections



Future 2020 Traffic Volumes

The proposed development is anticipated to be constructed and occupied by 2020. To determine AM and PM peak hour background traffic for the year 2020 (or the traffic expected to be present in 2020 without the proposed development) two elements of growth were considered, which include:

- Regional trip growth - growth to account for regional trips was applied to existing traffic counts using an estimated growth of 5% (2.5% per year for two years)
- Approved development (local) growth - traffic added for nearby developments that have been approved but not constructed were estimated using the Traffic Impact Studies for those developments.

The City provided traffic impact studies that described how many trips would be generated for the six approved developments shown in **Figure 5**. The following is a list of approved, but not yet occupied developments near the study area that will be completed before 2020.

1. Alpha Scents: 7,500 square foot corporate headquarters building including warehouse/ shipping area
2. Canby Active Water Sports: 25,000 square foot building including boat sales, display, and warehousing plus 35,000 square foot outdoor display area
3. BBC Steel Expansion: 31,050 square foot building including storage, office, and manufacturing space
4. BE Group: 72,800 square foot building including manufacturing, distribution, and office
5. Clark Warehouse: 12,000 square foot warehouse
6. Reimers Industrial: 17,400 and 24,000 square foot buildings including flexible industrial space

The 2020 AM and PM Peak Hour Background Traffic volumes are shown in **Figure 6**. The 2020 AM and PM Peak Hour Build (with project) traffic volumes based on the site trip generation and distribution are shown in **Figure 7**.

Figure 5: Locations of Other Recently Approved Developments in the Study Area

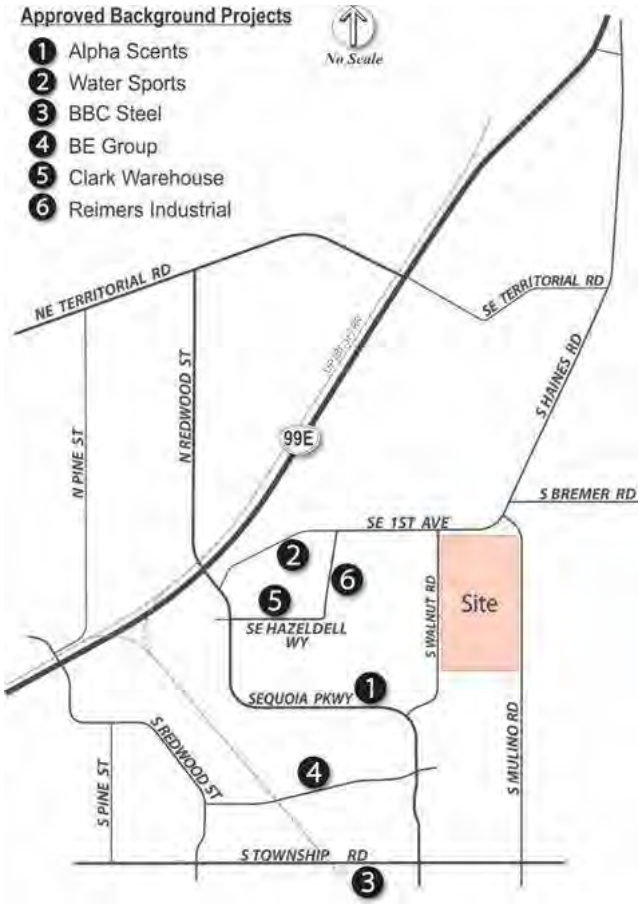


Figure 6: 2020 Background Conditions Weekday AM/PM Peak Hour Traffic Volumes

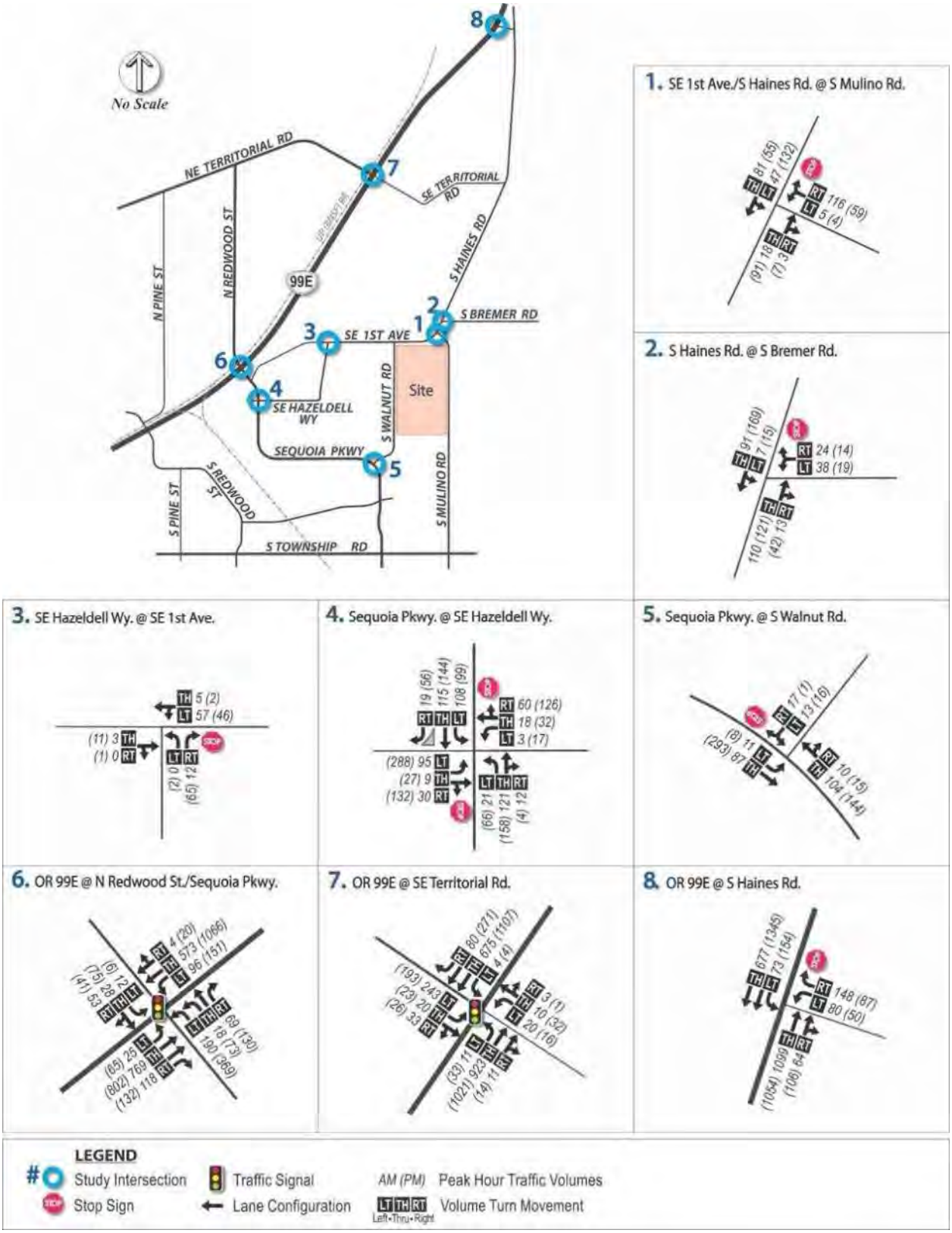
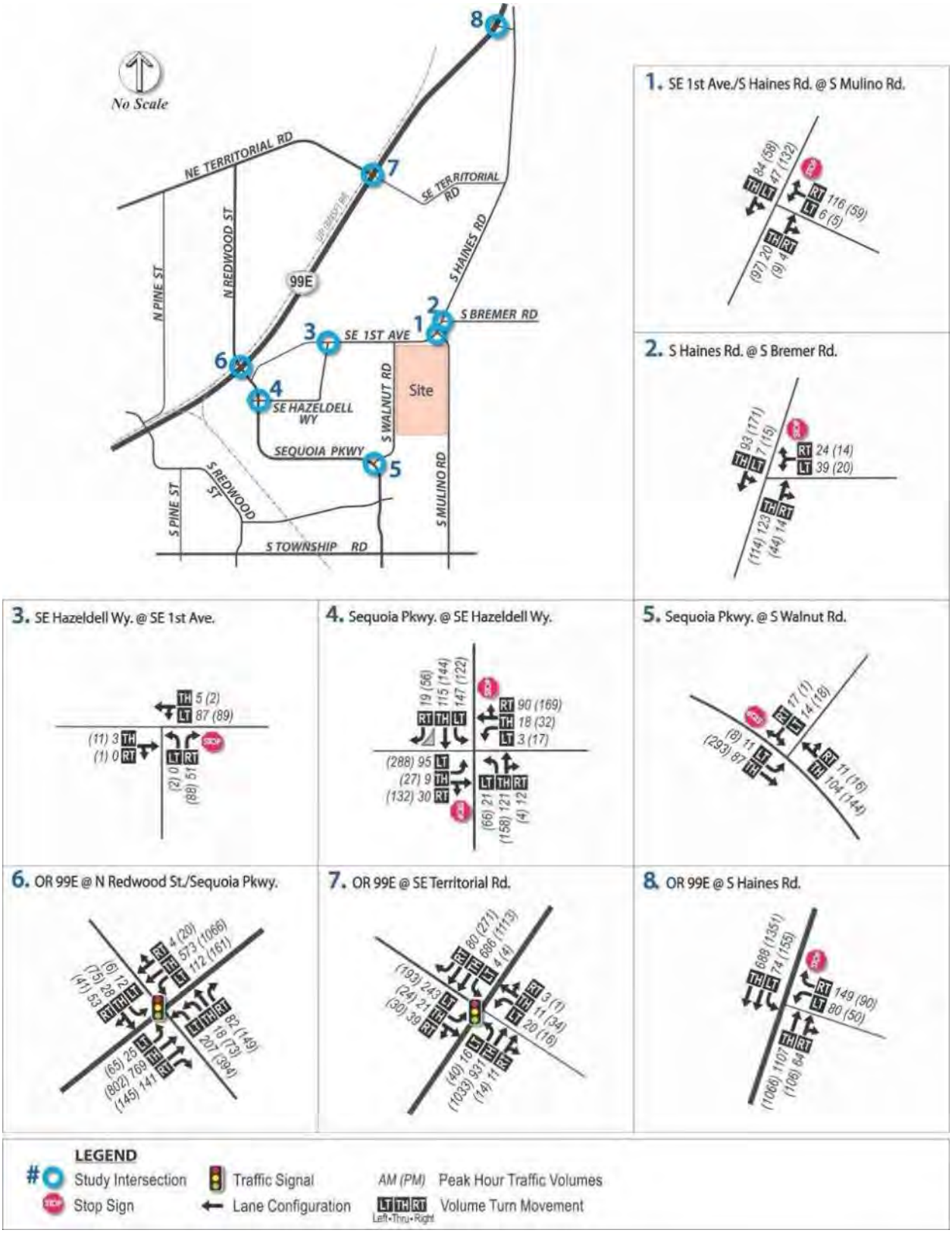


Figure 7: 2020 Build Conditions Weekday AM/PM Peak Hour Traffic Volumes



Future 2020 Intersection Operations

To determine project impacts at the study area intersections, traffic operating conditions were analyzed during the weekday AM and PM peak hours for the 2020 Background Traffic and 2020 Build (with project) conditions. Analyzing 2020 Background Traffic conditions established a baseline to determine the impact of the proposed development at the study area intersections. **Table 4** lists the 2020 Background Traffic intersection operations at study area intersections, while **Table 5** lists the 2020 Build intersection operations at study area intersections.

As listed in **Table 4**, no additional intersections fail to meet the mobility standards when compared to the existing conditions. The intersections of Sequoia Parkway/Hazeldell Way and OR 99E/Haines Road do not meet mobility targets under existing conditions and would experience increased delay with added background traffic. Detailed intersection operations calculation worksheets are included in Appendix C.

Table 4: 2020 Background Traffic Weekday AM and PM Peak Hour Study Intersection Operations

Intersection	Mobility Targets/ Standards	AM Peak Hour			PM Peak Hour		
		Delay	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*
Signalized							
OR 99 E & Sequoia Parkway/Redwood Street	0.85 V/C	21.1	C	0.51	32.2	C	0.70
OR 99 E & Territorial Road	0.85 V/C	16.0	B	0.65	14.0	B	0.61
Unsignalized							
Mulino Road & SE 1st Avenue	0.95 V/C	9.0	A/A	0.14	9.4	A/A	0.10
SE 1st Avenue/Haines Road & Bremer Road	0.95 V/C	10.1	A/B	0.09	10.4	A/B	0.05
Hazeldell Way & SE 1st Avenue	LOS E 0.90 V/C	8.4	A/A	0.05	8.6	A/A	0.07
Sequoia Parkway & Hazeldell Way	LOS E 0.90 V/C	18.4	A/C	0.33	**148.9**	**A/F**	**1.34**
Sequoia Parkway & Walnut Road	LOS E 0.90 V/C	9.7	A/A	0.04	11.4	A/B	0.04
OR 99 E & Haines Road	0.85 V/C	**>300**	**A/F**	**1.86[a]**	**>300**	**A/F**	**1.80[a]**

Bolded Red values do not meet mobility targets/standards.

Two-Way-Stop Controlled Intersections:
- Delay = Average Intersection Delay (sec.) of Worst Approach
- LOS = Level of Service of Major Street/Minor Street (i.e., A/F) of Worst Approach
- v/c = Volume-to-Capacity Ratio of Worst Movement

All-Way Stop Controlled Intersections:
- LOS & Delay = Reported for Entire Intersection
- v/c = Volume-to-Capacity Ratio of Worst Movement

[a] See narrative preceding Table 2 for note regarding existing v/c > 1.0. Conditions are overstated, and actual v/c is lower than reported.

As listed in **Table 5**, Sequoia Parkway & Hazeldell Way and OR 99E & Haines Road (which fail under both existing and 2020 Background Traffic conditions) continue to fail under 2020 Build conditions.

Project Shakespeare would not add trips to the high delay eastbound (shopping center) approach at the Sequoia Parkway/Hazeldell Way intersection. However, the delay would increase due to the project adding additional traffic to the westbound right turn movement at the intersection which conflicts with the eastbound left turn movement.

The project does not significantly contribute to the failing turn movements at the intersection of OR 99E and Haines Road. As shown in **Figure 5**, the project would add approximately 20 total trips during both the AM and PM peak hours, or approximately one percent or less of total traffic at the intersection.

Table 5: 2020 Build (with development) Weekday AM and PM Peak Hour Study Intersection Operations

Intersection	Mobility Targets/ Standards	AM Peak Hour			PM Peak Hour		
		Delay	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*
Signalized							
OR 99 E & Sequoia Parkway/Redwood Street	0.85 V/C	22.2	C	0.53	33.5	C	0.71
OR 99 E & Territorial Road	0.85 V/C	16.8	B	0.66	14.3	B	0.61
Unsignalized							
Mulino Road & SE 1st Avenue	0.95 V/C	9.1	A/A	0.14	9.5	A/A	0.10
SE 1st Avenue/Haines Road & Bremer Road	0.95 V/C	10.2	A/B	0.09	10.5	A/B	0.06
Hazeldell Way & SE 1st Avenue	LOS E 0.90 V/C	9.1	A/A	0.07	8.8	A/A	0.10
Sequoia Parkway & Hazeldell Way	LOS E 0.90 V/C	24.5	A/C	0.43	**>300**	**A/F**	**1.66**
Sequoia Parkway & Walnut Road	LOS E 0.90 V/C	9.7	A/A	0.04	11.4	A/B	0.04
OR 99 E & Haines Road	0.85 V/C	**>300**	**A/F**	**1.00[a]**	**>300**	**A/F**	**1.86[a]**
Intersections Added with Project (Unsignalized)							
SE 1st Avenue & Project Driveway (West)		10.7	A/B	0.03	11.3	A/B	0.03
SE 1st Avenue & Project Driveway (Central)		9.2	A/A	0.02	9.6	A/A	0.04
SE 1st Avenue & Project Driveway (East)		8.4	A/A	0.01	9.1	A/A	0.01

Bolded Red values do not meet mobility targets/standards.

Two-Way-Stop Controlled Intersections:
Delay = Average Intersection Delay (sec.) of Worst Approach
LOS = Level of Service of Major Street/Minor Street (i.e., A/F) of Worst Approach
v/c = Volume-to-Capacity Ratio of Worst Movement
All-Way Stop Controlled Intersections:
LOS & Delay = Reported for Entire Intersection
v/c = Volume-to-Capacity Ratio of Worst Movement

[a] See narrative preceding Table 2 for note regarding existing v/c > 1.0. Conditions are overstated, and actual v/c is lower than reported.

Vehicle Queuing Analysis

SimTraffic modeling software was used to estimate the 95th percentile vehicle queues for each of the study area intersection approach movements. This analysis estimates the queue length that would not be exceeded in 95 percent of the queues formed during the peak hour. When vehicle queues extend beyond available storage, turning queues can block through movements and through movements can block upstream intersections. Such conditions result in the potential for increased risk for rear-end collisions and loss in system capacity.

Table 6 shows 2020 estimated queue lengths at approaches of study intersections both without and with the proposed project. Four locations would exceed existing storage with and without the addition of project traffic. These locations are not projected to have increased queue lengths with the project traffic, except for the eastbound left turn movement from the shopping center exit at Hazeldell Way.

While this location has only 80 feet of striped storage, existing vehicle queues were observed to stack through the drive aisle back to the building frontage.

Table 6: Estimated 95th Percentile Queue Lengths

Intersection	Movement	95th Percentile Queue				
		AM Peak		PM Peak		Available Storage
		Without Project	*With Project*	*Without Project*	*With Project*	
OR 99E & Sequoia Parkway/Redwood Street	EBL	50	50	50	50	90
	WBL	150	150	250	250	180
	WBR	75	75	75	75	430
	NBL	75	50	**175**	**150**	115
	NBR	100	75	100	75	300
	SBL	150	175	**275**	**275**	190
OR 99E & Territorial Road	EBL	125	200	225	200	225
	WBL	50	50	50	50	140
	NBL	50	50	75	75	400
	SBL	25	25	25	25	400
	SBR	50	50	75	75	550
Mulino Road & SE 1st Avenue	NBLR	50	50	50	50	One Lane Approach
SE 1st Avenue/Haines Road & Bremer Road	WBLR	50	50	50	50	One Lane Approach
Hazeldell Way & SE 1st Avenue	NBR	25	75	50	50	125
Sequoia Parkway & Hazeldell Way	EBL	75	**100**	**275**	**300**	80
	WBL	25	25	50	50	120
	NBL	25	25	50	25	150
	SBL	50	75	50	50	130
Sequoia Parkway & Walnut Road	WBLR	50	50	25	25	One Lane Approach
OR 99E & Haines Road	WBL [a]	**400+**	**400+**	**400+**	**400+**	100
	SBL	75	75	150	175	340
SE 1st Avenue & West Driveway	NBLR	-	75	-	75	One Lane Approach
SE 1st Avenue & Central Driveway	NBLR	-	50	-	50	One Lane Approach
SE 1st Avenue & East Driveway	NBLR	-	25	-	50	One Lane Approach

[a] Under all scenarios, the queue exceeds available storage by a factor of 4 or more, exact results vary dramatically by simulation run because of stochastic vehicle assignment and demand exceeding capacity

Bolded Red = 95th percentile queue length exceeds available storage

Hazeldell Way Extension Sensitivity Analysis

The City TSP currently has a proposed extension of Hazeldell Way which would aid the substandard operations at Sequoia Parkway/Hazeldell Way by providing an alternate route to OR 99E. This extension is shown in **Figure 8** and would provide a more direct route from the Project Shakespeare site and other areas within and adjacent to the Pioneer Industrial Park) to OR 99E and regional connections. This

connection would also help draw some (existing and future) traffic from Sequoia Parkway. **Table 7** lists the intersection operations with this extension.

Figure 8: Approximate Conceptual Alignment of Hazeldell Way Extension

As listed in **Table 7**, the Hazeldell Way extension would improve operations at the intersection of Sequoia Parkway/Hazeldell Way, but the intersection would still not meet mobility targets due to the high delay from the shopping center driveway. The conditions at OR 99E/Haines Road would likely remain unchanged.

Table 7: 2020 Build Weekday PM Peak Hour Study Intersection Operations – With Hazeldell Extension

Intersection	Mobility Targets/ Standards	Without Hazeldell Extension to 99E			With Hazeldell Extension to 99E		
		Delay	*LOS*	*v/c*	*Delay*	*LOS*	*v/c*
Signalized							
OR 99 E & Sequoia Parkway/Redwood Street	0.85 V/C	33.5	C	0.71	30.9	C	0.69
OR 99 E & Territorial Road	0.85 V/C	14.3	B	0.61	No change		
Unsignalized							
Mulino Road & SE 1st Avenue	0.95 V/C	9.5	A/A	0.10	No change		
SE 1st Avenue/Haines Road & Bremer Road	0.95 V/C	10.5	A/B	0.06	No change		
Hazeldell Way & SE 1st Avenue [b]	LOS E 0.90 V/C	8.8	A/A	0.10	7.8	A	0.13
Sequoia Parkway & Hazeldell Way	LOS E 0.90 V/C	**>300**	**A/F**	**1.66[a]**	**57.5**	**A/F**	**0.98**
Sequoia Parkway & Walnut Road	LOS E 0.90 V/C	11.4	A/B	0.04	No change		
OR 99 E & Haines Road	0.85 V/C	**>300**	**A/F**	**1.86[a]**	No change		
Intersections Added with Project (Unsignalized)							
SE 1st Avenue & Project Driveway (West)		11.3	A/B	0.03	No change		
SE 1st Avenue & Project Driveway (Central)		9.6	A/A	0.04	No change		
SE 1st Avenue & Project Driveway (East)		9.1	A/A	0.01	No change		

Bolded Red values do not meet mobility targets/standards.

Two-Way-Stop Controlled Intersections:
Delay = Average Intersection Delay (sec.) of Worst Approach
LOS = Level of Service of Major Street/Minor Street (i.e., A/F) of Worst Approach
v/c = Volume-to-Capacity Ratio of Worst Movement
All-Way Stop Controlled Intersections:
LOS & Delay = Reported for Entire Intersection
v/c = Volume-to-Capacity Ratio of Worst Movement

[a] See narrative preceding Table 2 for note regarding existing v/c > 1.0. Conditions are overstated, and actual v/c is lower than reported.

[b] Becomes AWSC as part of the Hazeldell Way Extension project

Potential Mitigation

There are two study intersections that fail to meet their mobility targets under existing conditions, which will continue to get worse with both the background approved development and the proposed project development. These intersections are:

- Sequoia Parkway /Hazeldell Way
- OR 99E / Haines Road

The Hazeldell Way extension would partially address the intersection delay issues at the Sequoia Parkway/Hazeldell Way intersection. As demonstrated in the sensitivity analysis, this improvement would not address the high eastbound left turn traffic volume from the shopping center driveway turning left onto Sequoia Parkway. However, the improvement would provide direct benefit to the project site and would likely remove all project trips from the Sequoia Parkway/Hazeldell Way intersection.

A second mitigation option would be to provide a traffic signal at the Sequoia parkway/Hazeldell Way intersection. While this improvement is not identified in the Canby TSP, it would directly address the high delay movements at the intersection. Due to the proximity to the existing traffic signal at OR 99E/Sequoia Parkway, the new signal would need to be designed to accommodate vehicle storage and flow between the two intersections on Sequoia Parkway. Since the intersection is an existing issue, the site's proportionate share of the improvement cost would consider the share of site volume relative to all volume served at the intersection. This would yield a proportionate share of approximately five percent of the improvement cost.

There is no clear mitigation measure to address the traffic conditions at OR 99E/Haines Road. The intersection does not meet traffic signal warrants due to the low side street volume. Turn channelization has already been provided. The City of Canby TSP identifies this intersection as being substandard after all planned city improvements. Due to the low volume of traffic added to this location (approximately 20 vehicles per hour and one percent of total traffic) no improvement is recommended.

Site Plan Evaluation

A site plan showing the proposed development can be found in Appendix A.

Sight Circulation

The proposed site plan (Appendix A) shows the three site driveways and on-site circulation. The westernmost driveway would be primarily used by all trucks entering and leaving the site. Trucks entering the site would proceed through a security gate before continuing through the drive aisles along the west and south sides of the warehouse to the loading docks on the east side of the building. The center and eastern driveways would connect to the passenger vehicle parking lot on the north side of the warehouse. Both driveways would provide access to the full parking lot. Providing two driveways would allow efficient circulation within the lot, reducing out of direction travel, additional circulation, and conflicts with other vehicles and pedestrians within the lot, while improving access and the user experience for traffic leaving the site. Sidewalks on 1st Street would connect to pedestrian walkways located along each drive aisle that provide a direct connection to building frontage.

Sight Distance

The proposed site accesses (i.e., driveways) should meet American Association of State Highway and Transportation Officials (AASHTO) intersection sight distance requirements for safe egress as measured from 15 feet back from the edge of the travelled way. Based on a speed of 25 mph, the site accesses would require a minimum of 280 feet and 240 feet of intersection sight distance for left-turn and right-turn movements, respectively. In addition, the sight distance triangles should be clear of permanent objects (large signs, landscaping, etc.) that could potentially limit vehicle sight distance.

The project is proposing to provide three access points along SE 1st Avenue. Based on field review of the site and approximated locations of the proposed driveways, the easternmost driveway currently has approximately 260-280 feet of visibility to the east and the westernmost site access has more than 500 feet of visibility to the west. The sight distance for the easternmost sight driveway will depend on specific placement and may be limited by existing vegetation (either just east of the driveway, or north

of 1st Avenue on the inside of the curve). Prior to occupancy, sight distance at any access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon.

Access Spacing

Along the project frontage, 1st Avenue is under the jurisdiction of Clackamas County. The collector spacing standards for Clackamas County are 150 feet, which are met by the site driveways.

RECOMMENDATIONS

The following transportation mitigation measures are recommended to preserve study area transportation system performance with the proposed development.

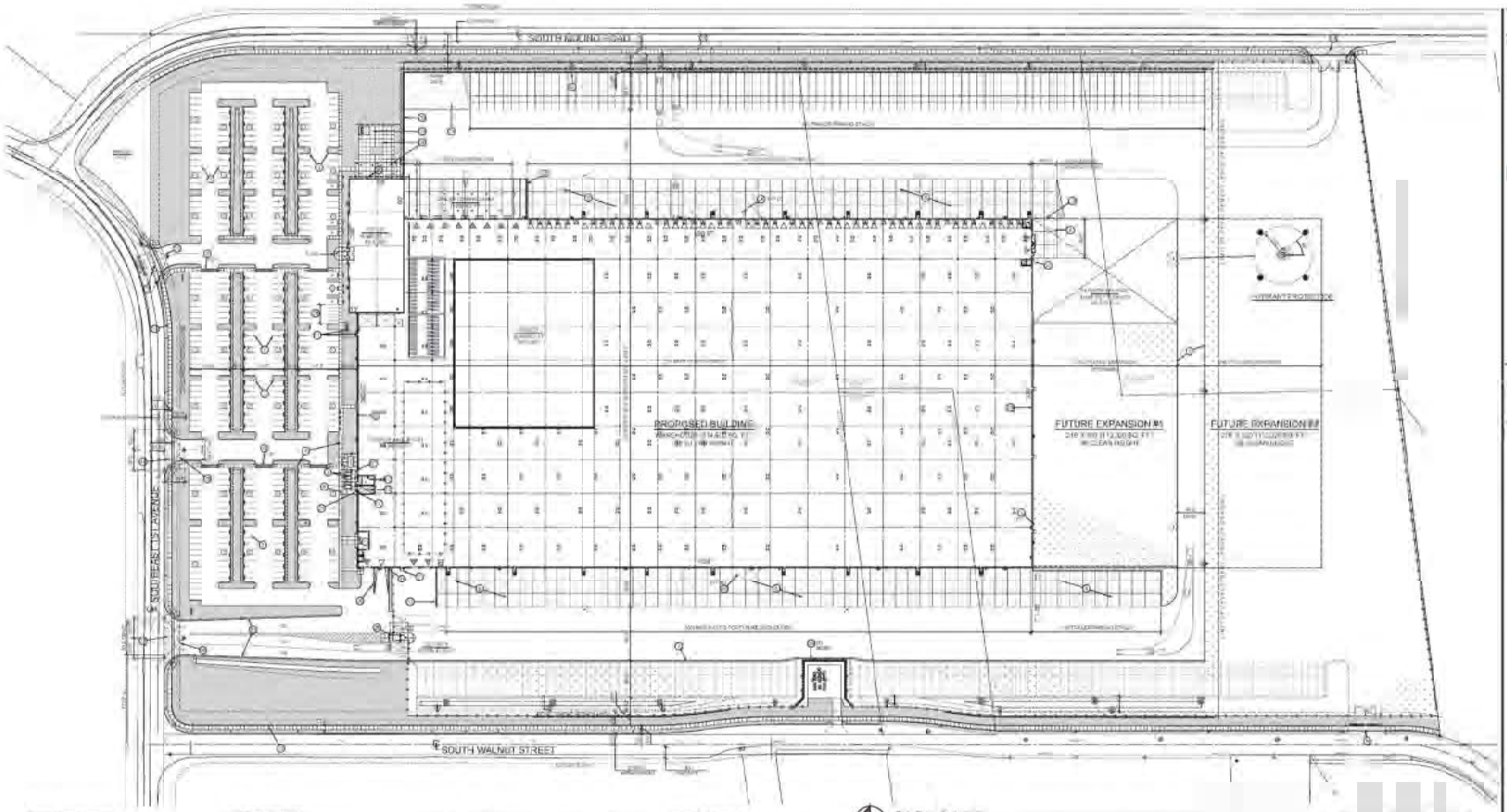
- Provide a proportionate share (five percent) of the costs for the following off-site transportation improvement:
    - New traffic signal at the intersection of Sequoia Parkway/Hazeldell Way. Note that this funding may instead be applied towards the Hazeldell Way extension between OR 99E and SE 1st Avenue
- Communicate truck route information to drivers, including awareness that they should avoid the following roadways in the vicinity of the project site:
    - S Haines Road between the project site and OR 99E to the north
    - S Bremer Road east of S Haines Road
    - S Mulino Road south of SE 1st Avenue/ S Haines Road
    - N Redwood Street north of OR 99E
- Ensure adequate site-access and circulation:
    - Site driveways shall be kept clear of visual obstructions (e.g., landscaping, signing, etc.) that could potentially limit sight distance for exiting drivers. This may require removal of existing vegetation to achieve adequate sight distance for the eastern driveway.
    - Prior to occupancy, sight distance at any existing access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon.

APPENDIX

The following items are included in the appendix:

- Appendix A – Site Plan
- Appendix B – Traffic Counts
- Appendix C – Intersection Capacity Worksheets
- Appendix D – Vehicle Queuing Worksheets

Appendix A: Site Plan



SITE PLAN

GENERAL NOTES

DEVELOPED SITE AREA SUMMARY

PARKING / LOADING SUMMARY

SITE PLANNING NOTES

SITE PLANNING SYMBOLS

VLMK
ENGINEERING + DESIGN

CBRE

LRS ARCHITECTS

MKE

OTTEN OID Landscape Architects, Inc.

NORTHWEST SURVEYING, INC.

CEO

PROJECT
SHAKESPEARE -
CANBY PROGRAM

A NEW
DISTRIBUTION
FACILITY

SE FIRST AVENUE AT
& WALNUT STREET
CANBY, OREGON

SITE PLAN

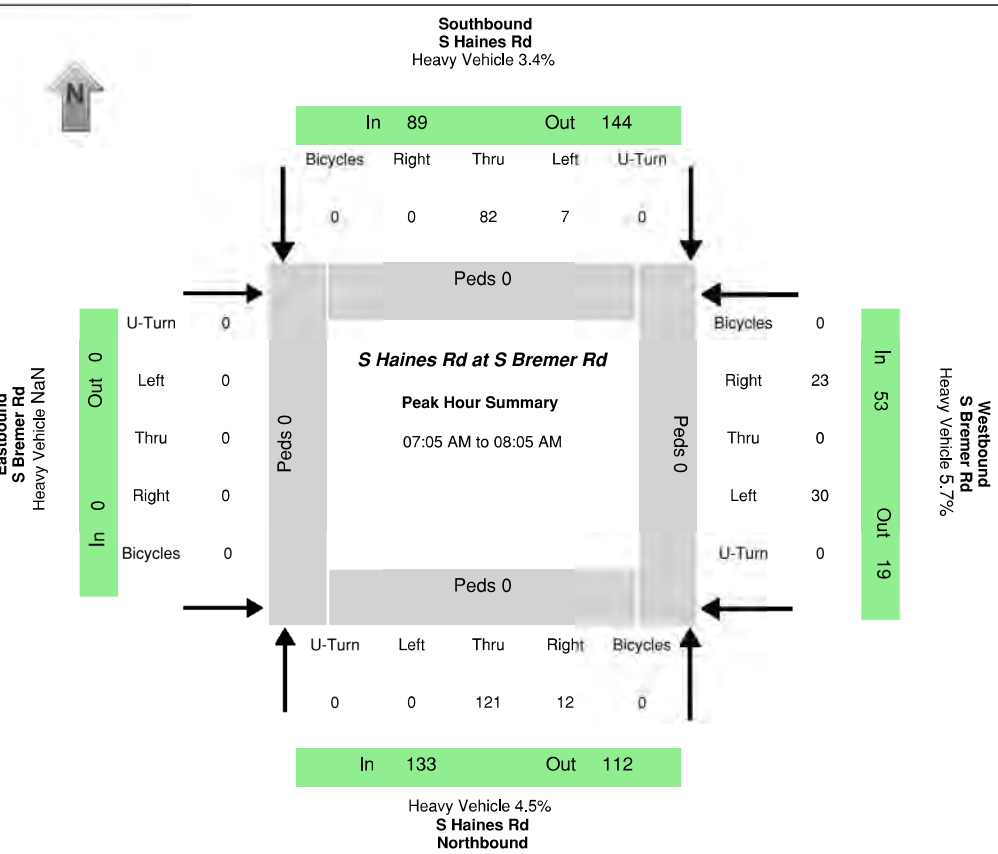
C1.0

ISSUED FOR REVIEW 95% PROGRESS SET 11/02/18

Appendix B: Traffic Volume Counts

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*S Haines Rd*
E/W street	*S Bremer Rd*
City, State	Canby OR
Site Notes	
Location	45.271107 - `-122.661628
Start Date	Thursday, October 04, 2018
Start Time	07:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:05:00 AM
Peak 15 Min Start	07:25:00 AM
PHF (15-Min Int)	0.89



Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	121	12	0	7	82	0	0	0	0	0	0	30	0	23	0	133	89	0	53	112	144	0	19
Percent Heavy Vehicles																							
0.0%	3.3%	16.7%	0.0%	0.0%	3.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	4.5%	3.4%	NaN	5.7%	5.4%	2.8%	NaN	10.5%

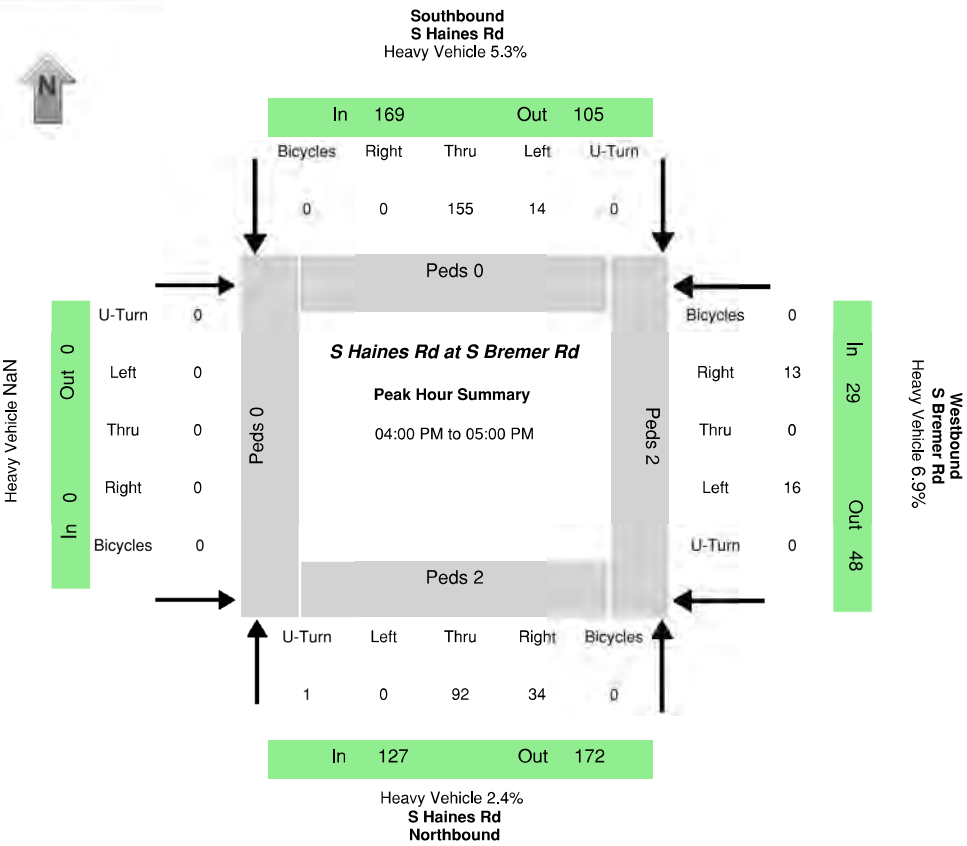
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

All Vehicle Volumes

	Northbound S Haines Rd				**Southbound** S Haines Rd				**Eastbound** S Bremer Rd				**Westbound** S Bremer Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
07:00:00 AM	0	8	2	0	1	2	0	0	0	0	0	0	3	0	3	0		
07:05:00 AM	0	8	0	0	0	6	0	0	0	0	0	0	1	0	2	0		
07:10:00 AM	0	8	1	0	0	13	0	0	0	0	0	0	0	0	3	0	61	
07:15:00 AM	0	7	1	0	1	11	0	0	0	0	0	0	3	0	0	0	65	
07:20:00 AM	0	10	0	0	0	4	0	0	0	0	0	0	2	0	3	0	67	
07:25:00 AM	0	12	0	0	0	9	0	0	0	0	0	0	2	0	3	0	68	
07:30:00 AM	0	14	0	0	0	7	0	0	0	0	0	0	4	0	1	0	71	
07:35:00 AM	0	13	2	0	1	5	0	0	0	0	0	0	2	0	2	0	77	
07:40:00 AM	0	6	1	0	1	5	0	0	0	0	0	0	4	0	1	0	69	
07:45:00 AM	0	7	3	0	2	3	0	0	0	0	0	0	5	0	2	0	65	
07:50:00 AM	0	10	3	0	0	4	0	0	0	0	0	0	4	0	2	0	63	
07:55:00 AM	0	13	0	0	2	7	0	0	0	0	0	0	1	0	1	0	69	267
08:00:00 AM	0	13	1	0	0	8	0	0	0	0	0	0	2	0	3	0	74	275
08:05:00 AM	0	5	1	0	1	5	0	0	0	0	0	0	1	0	0	0	64	271
08:10:00 AM	0	8	2	0	1	4	0	0	0	0	0	0	0	0	0	0	55	261
08:15:00 AM	0	4	0	0	0	6	0	0	0	0	0	0	1	0	3	0	42	252
08:20:00 AM	0	6	0	0	1	2	0	0	0	0	0	0	2	0	0	0	40	244
08:25:00 AM	0	6	0	0	1	2	0	0	0	0	0	0	2	0	3	0	39	232
08:30:00 AM	0	7	2	0	1	5	0	0	0	0	0	0	1	0	0	0	41	222
08:35:00 AM	0	7	0	0	1	4	0	0	0	0	0	0	0	0	1	0	43	210
08:40:00 AM	0	2	0	0	0	5	0	0	0	0	0	0	2	0	0	0	38	201
08:45:00 AM	0	6	2	0	1	4	0	0	0	0	0	0	3	0	3	0	41	198
08:50:00 AM	0	6	0	0	0	6	0	0	0	0	0	0	1	0	0	0	41	188
08:55:00 AM	0	5	1	0	0	3	0	0	0	0	0	0	2	0	1	0	44	176

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*S Haines Rd*
E/W street	*S Bremer Rd*
City, State	Canby OR
Site Notes	
Location	45.271107 - `-122.661628
Start Date	Thursday, October 04, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:00:00 PM
Peak 15 Min Start	04:00:00 PM
PHF (15-Min Int)	0.89



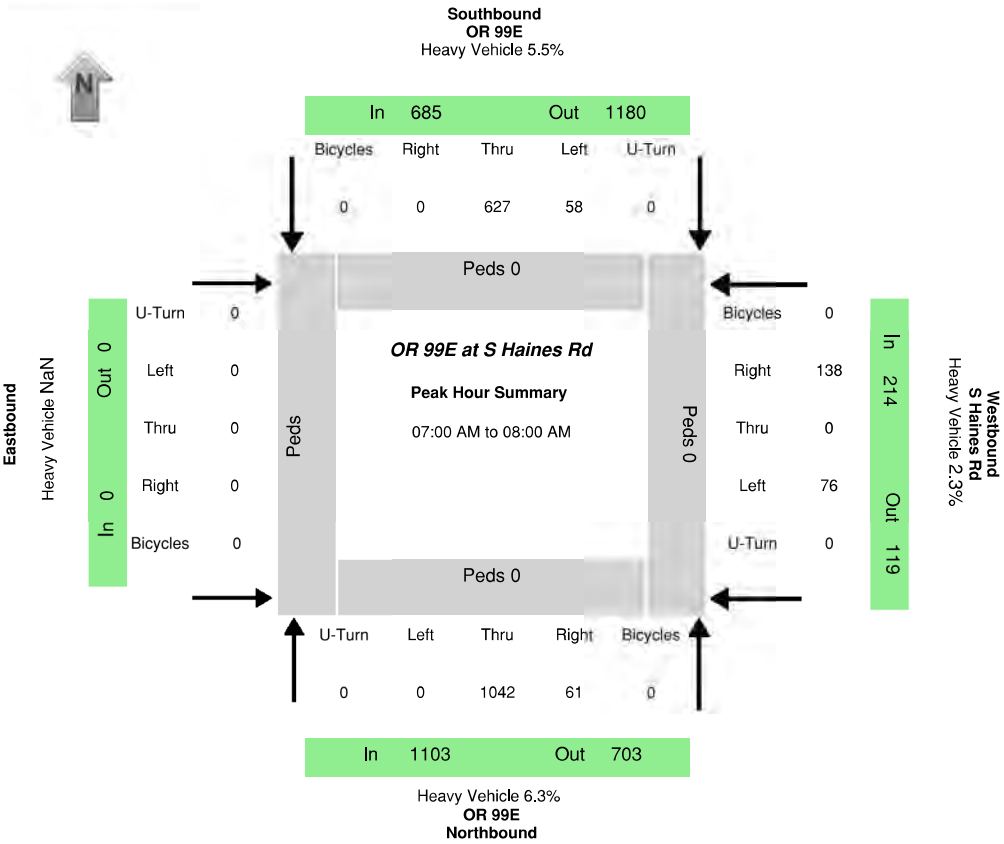
Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	92	34	1	14	155	0	0	0	0	0	0	16	0	13	0	127	169	0	29	172	105	0	48
Percent Heavy Vehicles																							
0.0%	1.1%	5.9%	0.0%	7.1%	5.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	2.4%	5.3%	NaN	6.9%	5.8%	1.0%	NaN	6.3%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	4

All Vehicle Volumes																		
	Northbound S Haines Rd				**Southbound** S Haines Rd				**Eastbound** S Bremer Rd				**Westbound** S Bremer Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
04:00:00 PM	0	12	6	0	0	15	0	0	0	0	0	0	1	0	0	0		
04:05:00 PM	0	5	2	0	3	15	0	0	0	0	0	0	3	0	5	0		
04:10:00 PM	0	8	3	0	1	10	0	0	0	0	0	0	2	0	0	0	91	
04:15:00 PM	0	9	2	0	1	13	0	0	0	0	0	0	0	0	0	0	82	
04:20:00 PM	0	12	3	1	0	11	0	0	0	0	0	0	3	0	1	0	80	
04:25:00 PM	0	7	2	0	1	12	0	0	0	0	0	0	1	0	2	0	81	
04:30:00 PM	0	7	4	0	0	15	0	0	0	0	0	0	2	0	1	0	85	
04:35:00 PM	0	7	2	0	3	16	0	0	0	0	0	0	0	0	1	0	83	
04:40:00 PM	0	5	3	0	2	20	0	0	0	0	0	0	1	0	1	0	90	
04:45:00 PM	0	5	1	0	1	10	0	0	0	0	0	0	1	0	1	0	80	
04:50:00 PM	0	9	1	0	0	7	0	0	0	0	0	0	1	0	0	0	69	
04:55:00 PM	0	6	5	0	2	11	0	0	0	0	0	0	1	0	1	0	63	325
05:00:00 PM	0	7	3	0	0	10	0	0	0	0	0	0	3	0	0	0	67	314
05:05:00 PM	0	7	1	0	3	17	0	0	0	0	0	0	3	0	2	0	82	314
05:10:00 PM	0	4	3	0	0	9	0	0	0	0	0	0	0	0	0	0	72	306
05:15:00 PM	0	5	3	0	1	14	0	0	0	0	0	0	2	0	1	0	75	307
05:20:00 PM	0	6	2	0	1	15	0	0	0	0	0	0	1	0	0	0	67	301
05:25:00 PM	0	9	2	0	0	15	0	0	0	0	0	0	2	0	1	0	80	305
05:30:00 PM	0	4	5	0	3	19	0	0	0	0	0	0	1	0	1	0	87	309
05:35:00 PM	0	6	2	0	1	7	0	0	0	0	0	0	1	0	1	0	80	298
05:40:00 PM	0	9	4	0	1	6	0	0	0	0	0	0	3	0	1	0	75	290
05:45:00 PM	0	5	3	0	3	13	0	0	0	0	0	0	3	0	0	0	69	298
05:50:00 PM	0	4	3	0	1	9	0	0	0	0	0	0	0	0	0	0	68	297
05:55:00 PM	0	5	1	0	0	6	0	0	0	0	0	0	1	0	2	0	59	286

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*OR 99E*
E/W street	*S Haines Rd*
City, State	Canby OR
Site Notes	
Location	45.288198 - -122.656044
Start Date	Thursday, October 04, 2018
Start Time	07:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:00:00 AM
Peak 15 Min Start	07:30:00 AM
PHF (15-Min Int)	0.86



Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	1042	61	0	58	627	0	0	0	0	0	0	76	0	138	0	1103	685	0	214	703	1180	0	119
Percent Heavy Vehicles																							
0.0%	6.5%	1.6%	0.0%	5.2%	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.6%	0.0%	0.0%	0.0%	6.3%	5.5%	NaN	2.3%	5.7%	5.8%	NaN	3.4%

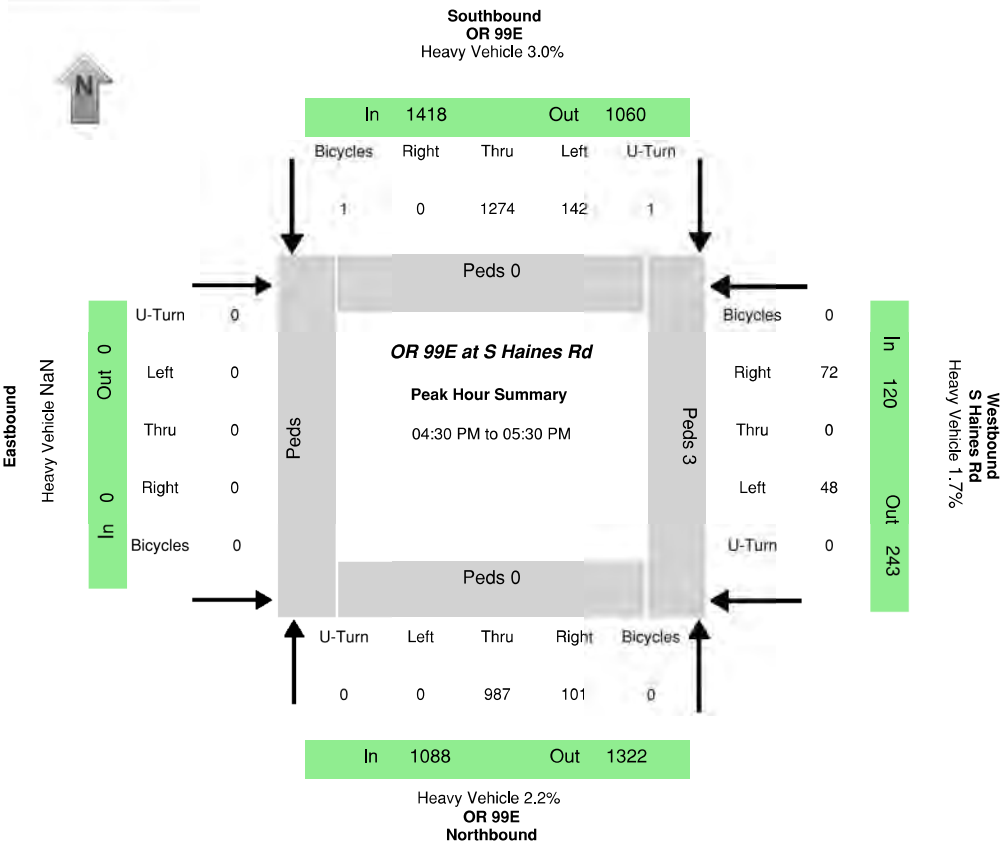
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
	0	0	0	0	0		0					0		0	0	0	0	0		0	0

All Vehicle Volumes

	Northbound OR 99E				**Southbound** OR 99E				**Eastbound**				**Westbound** S Haines Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
07:00:00 AM		90	4	0	3	38		0					5		13	0		
07:05:00 AM		71	7	0	9	49		0					4		7	0		
07:10:00 AM		110	2	0	2	38		0					6		15	0	473	
07:15:00 AM		73	6	0	5	57		0					6		13	0	480	
07:20:00 AM		81	1	0	3	67		0					4		14	0	503	
07:25:00 AM		89	5	0	6	40		0					6		7	0	483	
07:30:00 AM		109	10	0	1	46		0					10		18	0	517	
07:35:00 AM		102	7	0	3	56		0					7		20	0	542	
07:40:00 AM		92	5	0	5	68		0					8		12	0	579	
07:45:00 AM		88	5	0	7	58		0					5		6	0	554	
07:50:00 AM		71	1	0	8	54		0					5		6	0	504	
07:55:00 AM		66	8	0	6	56		0					10		7	0	467	2002
08:00:00 AM		70	6	0	5	46		0					3		14	0	442	1993
08:05:00 AM		55	4	0	3	50		0					5		13	0	427	1976
08:10:00 AM		75	7	0	2	48		0					4		4	0	414	1943
08:15:00 AM		72	2	0	8	56		0					6		9	0	423	1936
08:20:00 AM		62	1	0	3	58		0					5		6	0	428	1901
08:25:00 AM		70	9	0	2	51		0					2		11	0	433	1893
08:30:00 AM		50	7	0	3	41		0					7		10	0	398	1817
08:35:00 AM		72	1	0	0	51		0					5		9	0	401	1760
08:40:00 AM		69	3	0	4	44		0					7		2	0	385	1699
08:45:00 AM		67	8	0	8	56		0					5		5	0	416	1679
08:50:00 AM		63	5	0	1	48		0					4		4	0	403	1659
08:55:00 AM		71	2	0	5	40		0					4		7	0	403	1635

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*OR 99E*
E/W street	*S Haines Rd*
City, State	Canby OR
Site Notes	
Location	45.288198 - -122.656044
Start Date	Thursday, October 04, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:30:00 PM
Peak 15 Min Start	05:10:00 PM
PHF (15-Min Int)	0.96



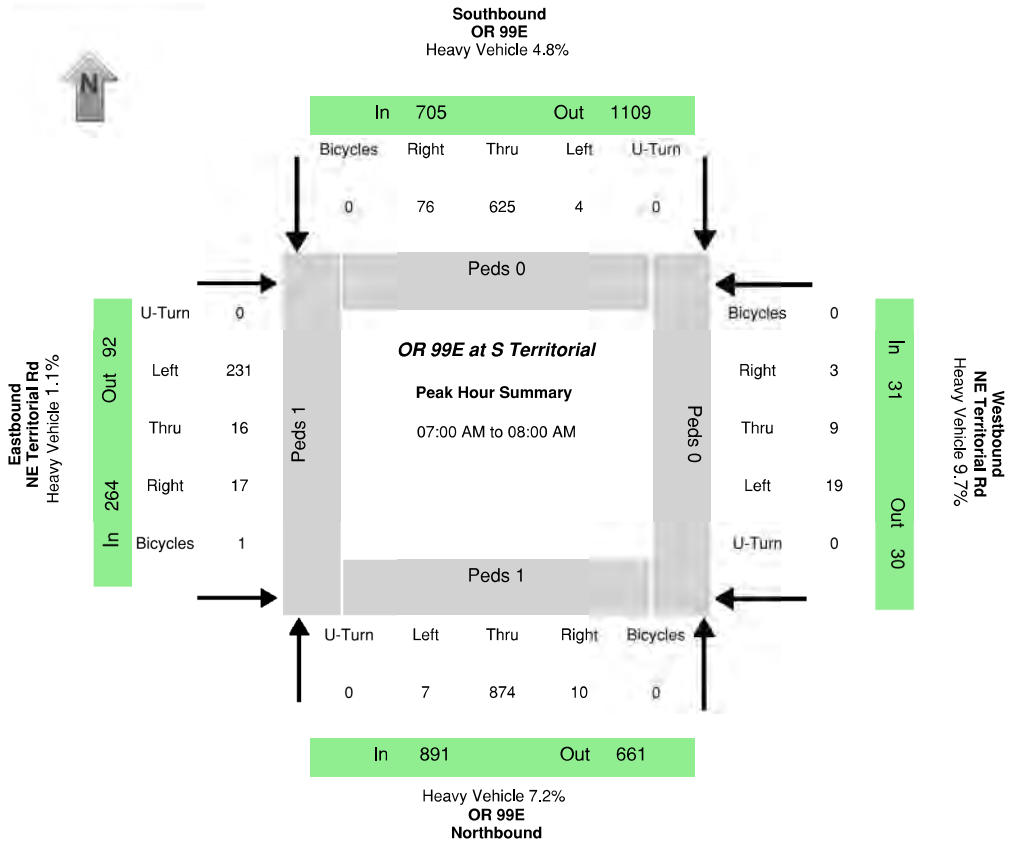
Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	987	101	0	142	1274	0	1	0	0	0	0	48	0	72	0	1088	1417	0	120	1322	1060	0	243
Percent Heavy Vehicles																							
0.0%	2.3%	1.0%	0.0%	0.0%	3.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	0.0%	1.4%	0.0%	2.2%	3.0%	NaN	1.7%	3.3%	2.3%	NaN	0.4%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
	0	0	0	0	1		0					0		0	0	1	0	0		3	3

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	OR 99E				OR 99E								S Haines Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
04:00:00 PM		96	6	0	15	117		0					1		3	0		
04:05:00 PM		79	10	1	15	121		0					5		6	0		
04:10:00 PM		67	4	0	8	105		0					6		7	0	672	
04:15:00 PM		84	12	0	8	89		0					4		9	0	640	
04:20:00 PM		80	9	0	13	121		0					3		4	0	633	
04:25:00 PM		63	8	0	13	99		0					2		10	0	631	
04:30:00 PM		87	3	0	11	106		0					1		7	0	640	
04:35:00 PM		77	10	0	18	105		0					5		4	0	629	
04:40:00 PM		78	9	0	13	111		0					5		7	0	657	
04:45:00 PM		78	11	0	9	115		0					1		3	0	659	
04:50:00 PM		93	11	0	9	84		0					3		8	0	648	
04:55:00 PM		81	8	0	6	104		0					4		9	0	637	2597
05:00:00 PM		73	6	0	12	105		0					4		4	0	624	2563
05:05:00 PM		77	15	0	13	107		0					1		8	0	637	2547
05:10:00 PM		84	6	0	10	121		0					8		3	0	657	2582
05:15:00 PM		92	8	0	11	91		1					6		7	0	669	2592
05:20:00 PM		85	5	0	16	116		0					6		8	0	684	2598
05:25:00 PM		82	9	0	14	109		0					4		4	0	674	2625
05:30:00 PM		83	7	0	16	92		0					4		5	0	665	2617
05:35:00 PM		84	7	0	8	92		0					0		4	0	624	2593
05:40:00 PM		74	6	0	7	94		0					2		2	0	587	2555
05:45:00 PM		74	10	0	14	104		0					7		6	0	595	2553
05:50:00 PM		18	0	0	1	26		0					1		1	0	447	2392

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*OR 99E*
E/W street	*NE Territorial Rd*
City, State	Canby OR
Site Notes	
Location	45.279365 - -122.666025
Start Date	Thursday, October 04, 2018
Start Time	07:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:00:00 AM
Peak 15 Min Start	07:35:00 AM
PHF (15-Min Int)	0.89



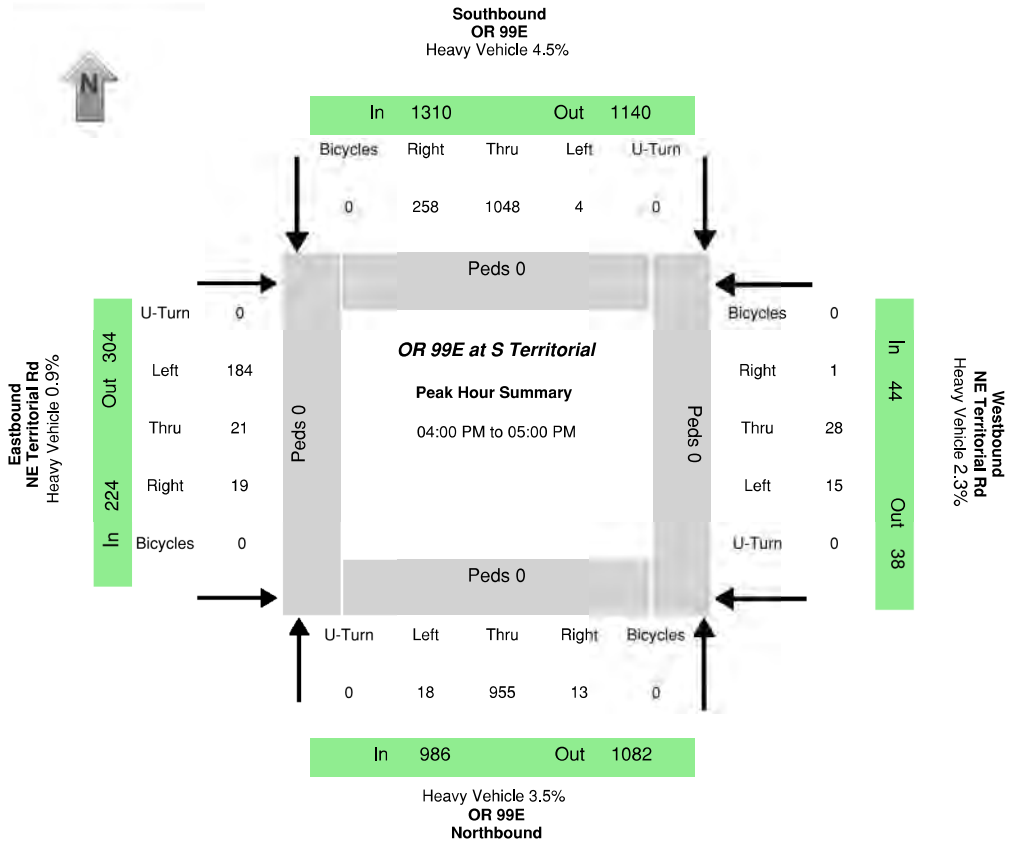
Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
7	874	10	0	4	625	76	0	231	16	17	0	19	9	3	0	891	705	264	31	661	1108	92	30
Percent Heavy Vehicles																							
14.3%	7.2%	0.0%	0.0%	75.0%	4.6%	2.6%	0.0%	0.9%	0.0%	5.9%	0.0%	5.3%	11.1%	33.3%	0.0%	7.2%	4.8%	1.1%	9.7%	4.7%	6.0%	4.3%	10.0%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	2

All Vehicle Volumes																		
	Northbound OR 99E				**Southbound** OR 99E				**Eastbound** NE Territorial Rd				**Westbound** NE Territorial Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
07:00:00 AM	0	79	2	0	0	46	4	0	15	1	0	0	2	1	0	0		
07:05:00 AM	0	67	0	0	1	33	2	0	23	1	1	0	0	0	0	0		
07:10:00 AM	2	77	1	0	0	56	8	0	27	1	2	0	3	1	0	0	456	
07:15:00 AM	0	63	1	0	0	46	8	0	21	4	1	0	2	1	0	0	453	
07:20:00 AM	1	63	0	0	0	54	13	0	14	0	5	0	0	0	0	0	475	
07:25:00 AM	0	84	0	0	1	51	8	0	22	2	0	0	2	0	1	0	468	
07:30:00 AM	3	79	2	0	1	42	5	0	26	1	1	0	1	1	0	0	483	
07:35:00 AM	1	98	2	0	1	61	5	0	20	1	1	0	2	1	0	0	526	
07:40:00 AM	0	74	1	0	0	62	5	0	19	2	1	0	1	0	0	0	520	
07:45:00 AM	0	79	0	0	0	65	3	0	19	0	3	0	2	1	0	0	530	
07:50:00 AM	0	53	1	0	0	51	8	0	10	1	2	0	4	1	0	0	468	
07:55:00 AM	0	58	0	0	0	58	7	0	15	2	0	0	0	2	2	0	447	1891
08:00:00 AM	1	64	0	0	0	50	3	0	16	1	2	0	0	1	0	0	413	1879
08:05:00 AM	0	51	0	0	0	48	3	0	7	0	5	0	1	2	0	0	399	1868
08:10:00 AM	0	67	1	0	0	48	6	0	9	1	0	0	1	1	0	0	389	1824
08:15:00 AM	2	59	1	0	0	45	10	0	18	1	0	0	2	3	0	0	392	1818
08:20:00 AM	1	57	0	0	0	61	6	0	6	0	1	0	0	2	0	0	409	1802
08:25:00 AM	1	60	0	0	0	47	5	0	12	0	1	0	1	2	0	0	404	1760
08:30:00 AM	1	51	0	0	0	38	6	0	14	2	2	0	1	0	0	0	378	1713
08:35:00 AM	1	56	1	0	1	46	8	0	9	0	1	0	1	1	0	0	369	1645
08:40:00 AM	1	57	0	0	0	39	9	0	20	1	1	0	1	0	0	0	369	1609
08:45:00 AM	2	54	3	0	0	48	8	0	9	0	0	0	0	1	1	0	380	1563
08:50:00 AM	0	56	1	0	0	59	6	0	15	3	0	0	0	3	0	0	398	1575
08:55:00 AM	1	61	2	0	0	30	6	0	8	2	0	0	1	2	1	0	383	1545

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*OR 99E*
E/W street	*NE Territorial Rd*
City, State	Canby OR
Site Notes	
Location	45.279365 - -122.666025
Start Date	Thursday, October 04, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:00:00 PM
Peak 15 Min Start	04:35:00 PM
PHF (15-Min Int)	0.96



Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
18	955	13	0	4	1048	258	0	184	21	19	0	15	28	1	0	986	1310	224	44	1082	1140	304	38
Percent Heavy Vehicles																							
0.0%	3.5%	15.4%	0.0%	25.0%	5.2%	1.2%	0.0%	0.5%	0.0%	5.3%	0.0%	6.7%	0.0%	0.0%	0.0%	3.5%	4.5%	0.9%	2.3%	5.3%	3.0%	1.0%	7.9%

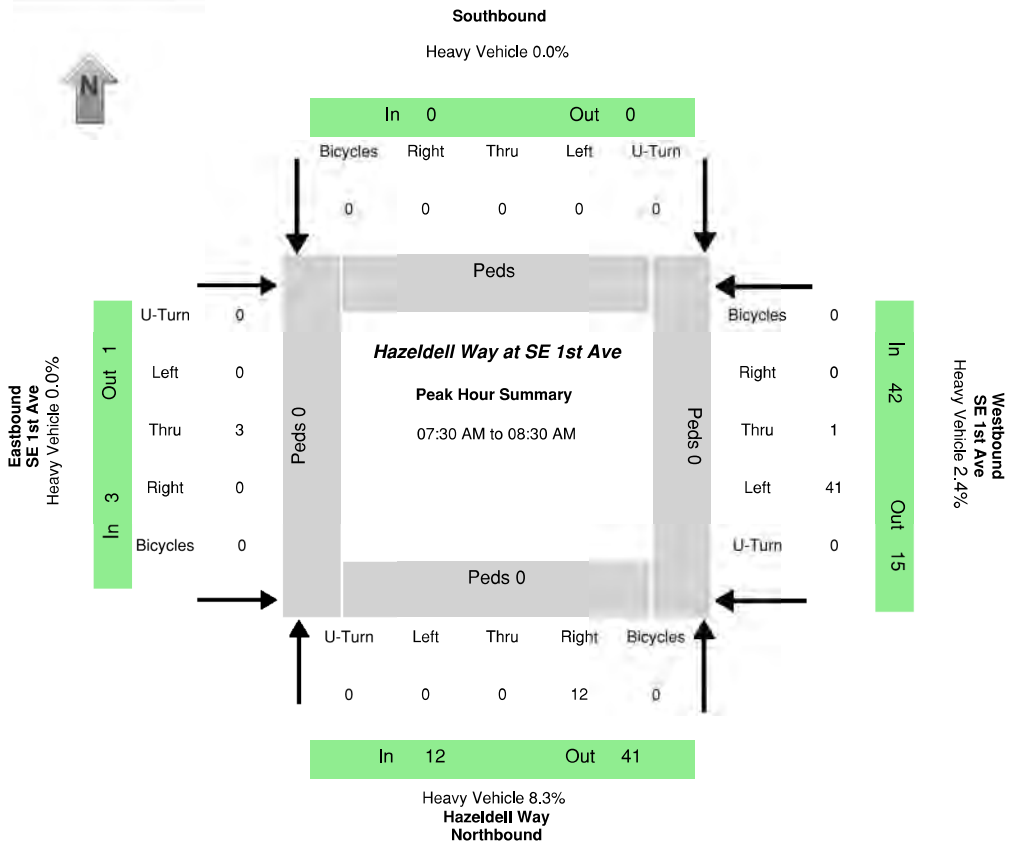
PHV- Bicycles																	PHV - Pedestrians				
Northbound				Southbound				Eastbound				Westbound					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

All Vehicle Volumes

	Northbound OR 99E				Southbound OR 99E				Eastbound NE Territorial Rd				Westbound NE Territorial Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
04:00:00 PM	2	81	0	0	0	83	17	0	6	2	1	0	2	2	1	0		
04:05:00 PM	1	77	0	0	0	99	23	0	19	4	1	0	0	3	0	0		
04:10:00 PM	0	84	5	0	0	90	23	0	12	1	0	0	2	3	0	0	644	
04:15:00 PM	1	75	1	0	1	79	16	0	16	1	2	0	3	3	0	0	645	
04:20:00 PM	0	82	1	0	0	94	29	0	11	2	4	0	1	1	0	0	643	
04:25:00 PM	1	79	1	0	0	84	17	0	11	2	1	0	1	2	0	0	622	
04:30:00 PM	1	79	1	0	1	88	14	0	13	1	1	0	2	2	0	0	627	
04:35:00 PM	3	77	1	0	0	82	18	0	18	5	1	0	0	3	0	0	610	
04:40:00 PM	1	76	1	0	0	99	25	0	19	2	5	0	1	2	0	0	642	
04:45:00 PM	4	84	0	0	0	98	19	0	25	0	0	0	0	1	0	0	670	
04:50:00 PM	2	76	0	0	1	65	25	0	19	1	2	0	2	4	0	0	659	
04:55:00 PM	2	85	2	0	1	87	32	0	15	0	1	0	1	2	0	0	656	2564
05:00:00 PM	2	62	0	0	0	88	14	0	11	0	0	0	1	1	0	0	604	2546
05:05:00 PM	1	89	0	0	0	85	23	0	14	3	3	0	0	3	0	0	628	2540
05:10:00 PM	0	67	0	0	2	101	19	0	16	1	0	0	0	1	0	0	607	2527
05:15:00 PM	4	78	1	0	1	73	28	0	22	0	1	0	0	4	0	0	640	2541
05:20:00 PM	0	75	1	0	0	85	22	0	14	0	5	0	0	2	0	0	623	2520
05:25:00 PM	4	79	1	0	0	94	20	0	11	2	1	0	2	2	0	0	632	2537
05:30:00 PM	0	68	0	0	0	89	21	0	27	5	2	0	3	3	1	0	639	2553
05:35:00 PM	4	72	1	0	0	89	20	0	17	2	2	0	1	1	0	0	644	2554
05:40:00 PM	2	73	0	0	0	70	10	0	17	2	4	0	1	0	1	0	608	2503
05:45:00 PM	2	65	1	0	1	85	16	0	0	0	2	0	1	1	1	0	564	2447
05:50:00 PM	2	63	1	0	0	90	16	0	17	2	2	0	0	0	2	0	550	2445
05:55:00 PM	8	67	1	0	0	68	22	0	15	3	0	0	1	2	0	0	557	2404

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Hazeldell Way*
E/W street	*SE 1st Ave*
City, State	Canby OR
Site Notes	
Location	45.270214 - -122.670049
Start Date	Thursday, August 23, 2018
Start Time	07:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:30:00 AM
Peak 15 Min Start	08:15:00 AM
PHF (15-Min Int)	0.79



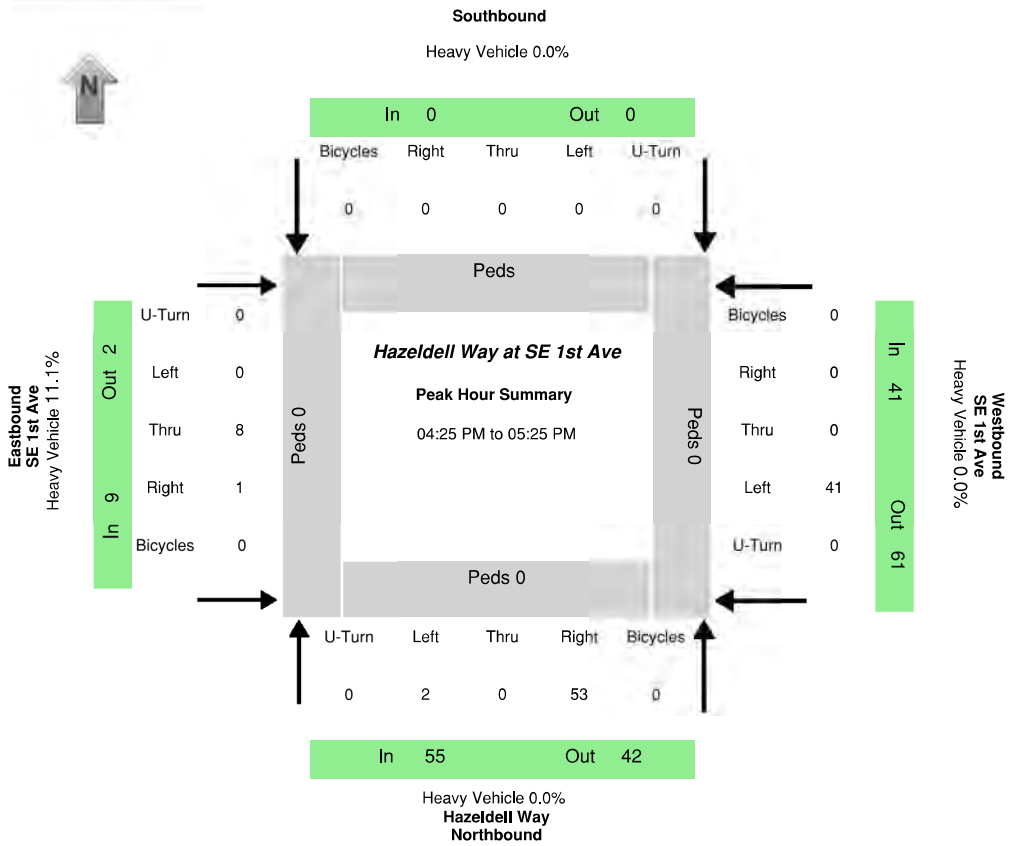
Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	12	0	0	0	0	0	0	3	0	0	41	1	0	0	12	0	3	42	41	0	1	15
Percent Heavy Vehicles																							
0.0%	0.0%	8.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	8.3%	0.0%	0.0%	2.4%	2.4%	0.0%	0.0%	6.7%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0		0	0						0	0	0	0	0		0	0	0		0	0	0

All Vehicle Volumes																		
	Northbound Hazeldell Way				**Southbound**				**Eastbound** SE 1st Ave				**Westbound** SE 1st Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
07:00:00 AM	0		0	0						0	0	0	2	0		0		
07:05:00 AM	0		0	0						0	0	0	1	0		0		
07:10:00 AM	0		1	0						0	0	0	3	0		0	7	
07:15:00 AM	0		1	0						0	0	0	2	1		0	9	
07:20:00 AM	0		2	0						0	0	0	4	0		0	14	
07:25:00 AM	0		0	0						0	0	0	4	1		0	15	
07:30:00 AM	0		0	0						0	0	0	5	0		0	16	
07:35:00 AM	0		1	0						0	0	0	2	0		0	13	
07:40:00 AM	0		3	0						0	0	0	2	0		0	13	
07:45:00 AM	0		0	0						0	0	0	5	0		0	13	
07:50:00 AM	0		1	0						0	0	0	3	0		0	14	
07:55:00 AM	0		0	0						0	0	0	4	0		0	13	48
08:00:00 AM	0		0	0						0	0	0	4	0		0	12	50
08:05:00 AM	0		1	0						1	0	0	2	1		0	13	54
08:10:00 AM	0		0	0						0	0	0	4	0		0	13	54
08:15:00 AM	0		2	0						1	0	0	0	0		0	12	53
08:20:00 AM	0		1	0						0	0	0	4	0		0	12	52
08:25:00 AM	0		3	0						1	0	0	6	0		0	18	57
08:30:00 AM	0		0	0						0	0	0	1	0		0	16	53
08:35:00 AM	0		4	0						0	0	0	3	0		0	18	57
08:40:00 AM	1		0	0						0	0	0	1	0		0	10	54
08:45:00 AM	0		0	0						0	1	0	2	0		0	12	52
08:50:00 AM	0		2	0						0	0	0	2	1		0	10	53
08:55:00 AM	0		1	0						0	0	0	2	2		0	13	54

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Hazeldell Way*
E/W street	*SE 1st Ave*
City, State	Canby OR
Site Notes	
Location	45.270214 - -122.670049
Start Date	Thursday, August 23, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:25:00 PM
Peak 15 Min Start	04:30:00 PM
PHF (15-Min Int)	0.85



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
2	0	53	0	0	0	0	0	0	8	1	0	41	0	0	0	55	0	9	41	42	0	2	61

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.1%	0.0%	0.0%	0.0%	0.0%	1.6%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0		0	0						0	0	0	0	0		0	0

PHV - Pedestrians

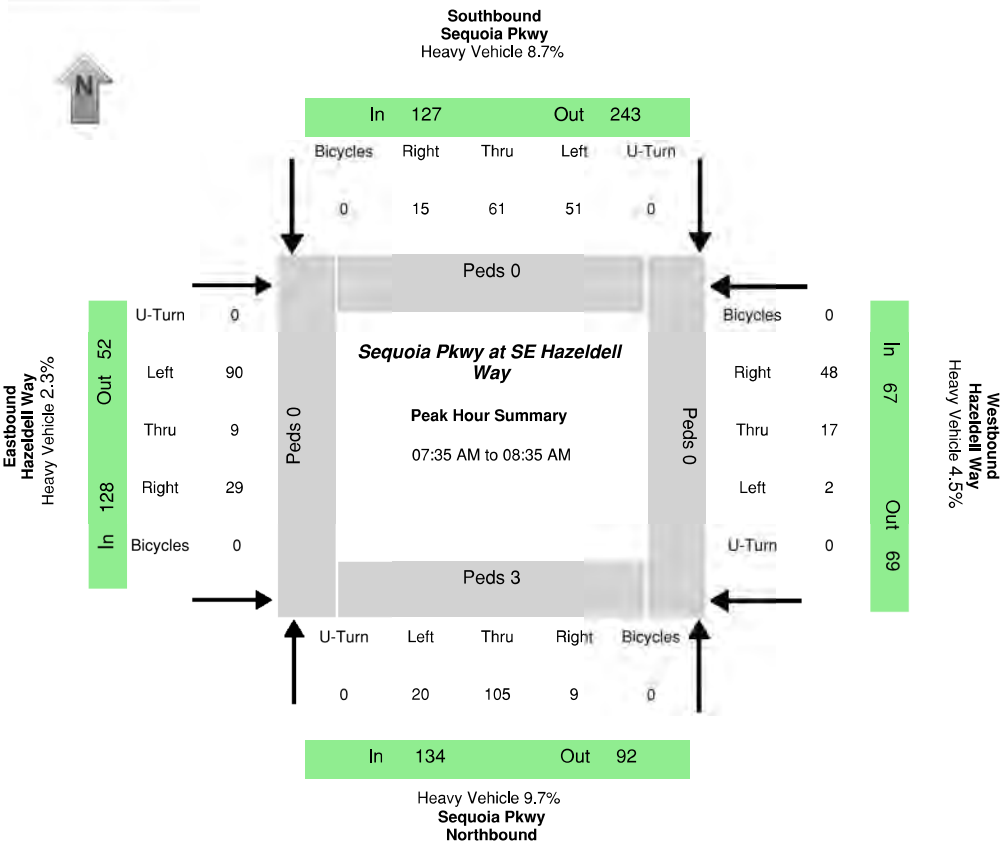
in Crosswalk				
NB	SB	EB	WB	**Sum**
0		0	0	0

All Vehicle Volumes

	Northbound Hazeldell Way				Southbound				Eastbound SE 1st Ave				Westbound SE 1st Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
04:00:00 PM	0		3	0						0	0	0	5	2		0		
04:05:00 PM	0		2	0						0	0	0	2	0		0		
04:10:00 PM	0		0	0						1	0	0	8	0		0	23	
04:15:00 PM	0		5	0						0	0	0	1	0		0	19	
04:20:00 PM	0		4	0						2	0	0	2	0		0	23	
04:25:00 PM	1		4	0						1	0	0	3	0		0	23	
04:30:00 PM	0		2	0						0	0	0	4	0		0	23	
04:35:00 PM	0		6	0						1	0	0	3	0		0	25	
04:40:00 PM	0		10	0						0	0	0	5	0		0	31	
04:45:00 PM	0		1	0						0	0	0	1	0		0	27	
04:50:00 PM	0		6	0						0	0	0	6	0		0	29	
04:55:00 PM	0		5	0						0	0	0	4	0		0	23	100
05:00:00 PM	0		3	0						2	1	0	1	0		0	28	97
05:05:00 PM	1		7	0						1	0	0	1	0		0	26	103
05:10:00 PM	0		4	0						0	0	0	4	0		0	25	102
05:15:00 PM	0		2	0						1	0	0	4	0		0	25	103
05:20:00 PM	0		3	0						2	0	0	5	0		0	25	105
05:25:00 PM	0		2	0						0	0	0	3	0		0	22	101
05:30:00 PM	0		2	0						0	0	0	0	0		0	17	97
05:35:00 PM	0		5	0						0	0	0	2	0		0	14	94
05:40:00 PM	0		1	0						0	0	0	2	0		0	12	82
05:45:00 PM	0		6	0						0	0	0	6	0		0	22	92
05:50:00 PM	0		3	0						0	1	0	2	1		0	22	87
05:55:00 PM	0		3	0						0	0	0	1	0		0	23	82

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Sequoia Pkwy*
E/W street	*Hazeldell Way*
City, State	Canby OR
Site Notes	
Location	45.267388 - -122.674783
Start Date	Thursday, August 23, 2018
Start Time	07:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:35:00 AM
Peak 15 Min Start	07:35:00 AM
PHF (15-Min Int)	0.89



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
20	105	9	0	51	61	15	0	90	9	29	0	2	17	48	0	134	127	128	67	92	243	52	69

Percent Heavy Vehicles

10.0%	9.5%	11.1%	0.0%	0.0%	16.4%	6.7%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	9.7%	8.7%	2.3%	4.5%	10.9%	6.6%	5.8%	1.4%

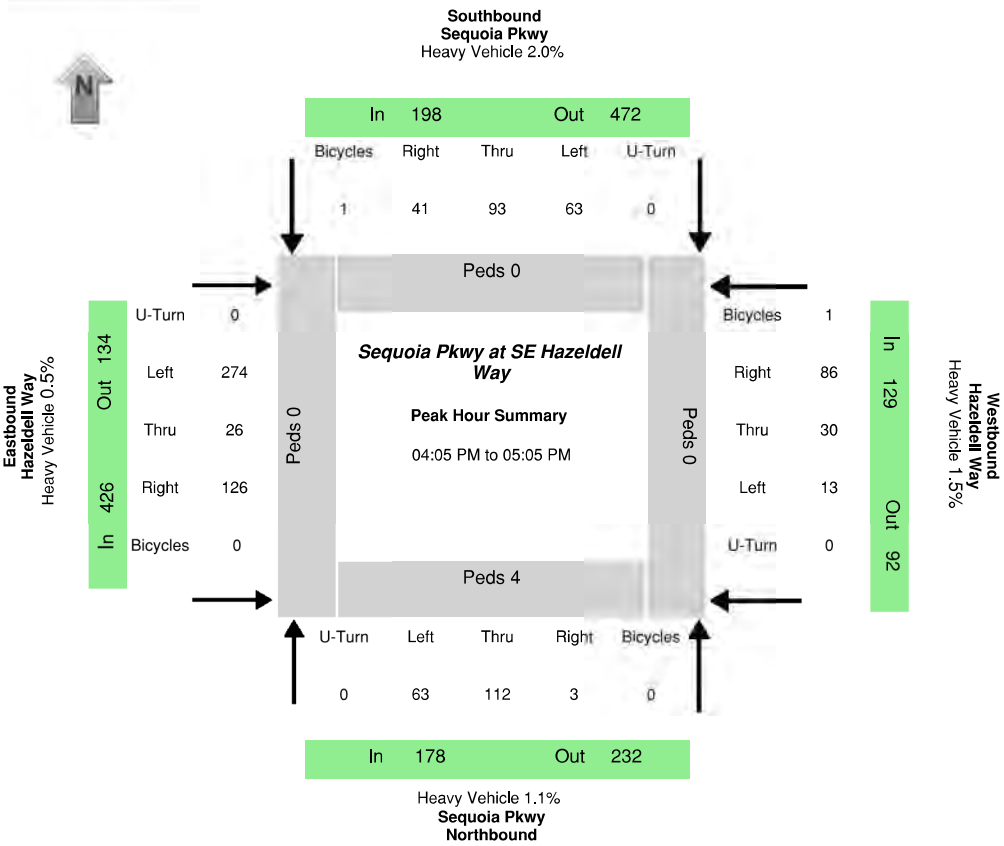
PHV- Bicycles																	PHV - Pedestrians				
Northbound				Southbound				Eastbound				Westbound					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3

All Vehicle Volumes

	Northbound Sequoia Pkwy				Southbound Sequoia Pkwy				Eastbound Hazeldell Way				Westbound Hazeldell Way				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
07:00:00 AM	3	6	1	0	5	4	0	0	0	0	1	0	0	0	1	0		
07:05:00 AM	0	8	0	0	0	2	0	0	4	0	2	0	0	1	2	0		
07:10:00 AM	5	3	1	0	1	10	1	0	7	0	4	0	0	1	2	0	75	
07:15:00 AM	1	6	0	0	2	4	2	0	6	0	0	0	0	1	3	0	79	
07:20:00 AM	1	9	0	0	2	6	2	0	7	3	3	0	0	0	3	0	96	
07:25:00 AM	5	11	0	0	3	11	3	0	1	1	2	0	0	0	2	0	100	
07:30:00 AM	2	7	0	0	3	5	2	0	7	0	2	0	0	1	4	0	108	
07:35:00 AM	1	12	1	0	1	3	5	0	7	1	1	0	0	1	3	0	108	
07:40:00 AM	3	12	0	0	11	3	1	0	9	1	8	0	0	1	3	0	121	
07:45:00 AM	1	7	1	0	4	6	0	0	16	0	0	0	0	2	3	0	128	
07:50:00 AM	3	4	1	0	2	9	0	0	4	0	3	0	0	2	3	0	123	
07:55:00 AM	2	7	0	0	3	9	2	0	6	2	1	0	0	1	3	0	107	403
08:00:00 AM	0	8	0	0	2	7	2	0	4	0	4	0	1	1	7	0	103	418
08:05:00 AM	1	7	1	0	2	6	0	0	6	0	2	0	0	5	3	0	105	432
08:10:00 AM	4	7	3	0	1	6	1	0	4	0	2	0	0	1	6	0	104	432
08:15:00 AM	0	9	1	0	8	4	0	0	7	2	3	0	0	0	2	0	104	443
08:20:00 AM	2	9	0	0	7	5	1	0	6	1	3	0	0	1	4	0	110	446
08:25:00 AM	3	12	1	0	6	1	1	0	12	2	2	0	0	1	3	0	119	451
08:30:00 AM	0	11	0	0	4	2	2	0	9	0	0	0	1	1	8	0	121	456
08:35:00 AM	0	8	0	0	4	4	1	0	5	2	2	0	0	1	3	0	112	450
08:40:00 AM	0	3	1	0	2	6	1	0	5	0	2	0	0	0	3	0	91	421
08:45:00 AM	1	10	0	0	1	5	4	0	6	1	3	0	0	2	3	0	89	417
08:50:00 AM	0	9	0	0	5	5	0	0	9	2	2	0	0	1	3	0	95	422
08:55:00 AM	3	7	1	0	3	3	0	0	6	1	1	0	0	0	2	0	99	413

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Sequoia Pkwy*
E/W street	*Hazeldell Way*
City, State	Canby OR
Site Notes	
Location	45.267388 - -122.674783
Start Date	Thursday, August 23, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:05:00 PM
Peak 15 Min Start	04:30:00 PM
PHF (15-Min Int)	0.95



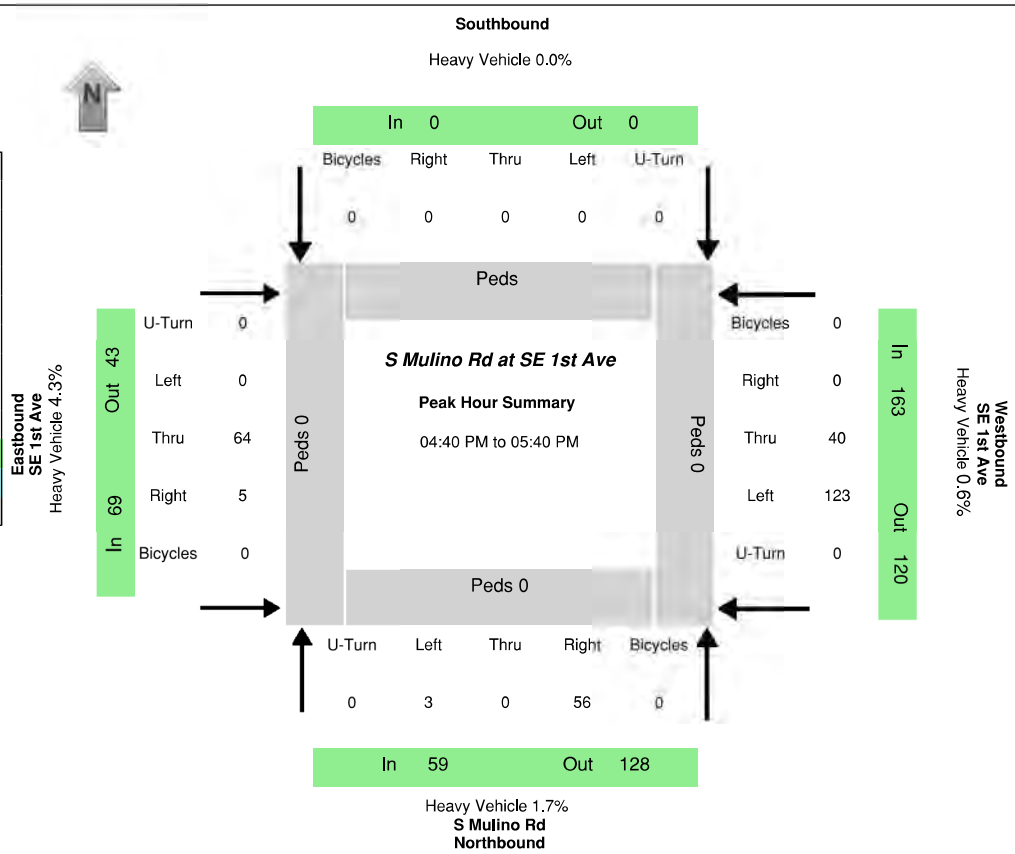
Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
63	112	3	0	63	93	41	0	274	26	126	0	13	30	86	0	178	197	426	129	232	472	134	92
Percent Heavy Vehicles																							
0.0%	1.8%	0.0%	0.0%	3.2%	2.2%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	1.1%	2.0%	0.5%	1.6%	0.9%	1.3%	0.0%	2.2%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2	4	0	0	0	4

All Vehicle Volumes																		
	Northbound Sequoia Pkwy				**Southbound** Sequoia Pkwy				**Eastbound** Hazeldell Way				**Westbound** Hazeldell Way				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
04:00:00 PM	1	24	0	0	5	9	2	0	18	2	7	0	0	2	6	0		
04:05:00 PM	8	18	0	0	4	4	2	0	20	0	7	0	1	1	7	0		
04:10:00 PM	2	8	0	0	8	7	6	0	22	1	9	0	0	2	8	0	221	
04:15:00 PM	6	9	1	0	7	6	1	0	18	1	9	0	1	8	10	0	222	
04:20:00 PM	7	6	0	0	5	9	3	0	28	2	12	0	2	1	8	0	233	
04:25:00 PM	5	9	0	0	5	7	6	0	24	5	8	0	0	0	7	0	236	
04:30:00 PM	6	10	1	0	6	9	6	0	23	1	8	0	1	2	6	0	238	
04:35:00 PM	6	9	1	0	6	9	5	0	16	4	11	0	1	4	5	0	232	
04:40:00 PM	6	8	0	0	5	10	3	0	24	5	13	0	1	6	7	0	244	
04:45:00 PM	5	12	0	0	4	7	2	0	22	0	12	0	0	0	8	0	237	
04:50:00 PM	6	8	0	0	4	9	2	0	30	4	13	0	2	1	5	0	244	
04:55:00 PM	1	5	0	0	4	6	2	0	23	2	11	0	1	4	5	0	220	921
05:00:00 PM	5	10	0	0	5	10	3	0	24	1	13	0	3	1	10	0	233	930
05:05:00 PM	5	4	0	0	6	7	3	0	21	4	14	0	0	4	2	0	219	928
05:10:00 PM	3	16	3	0	5	7	4	0	16	1	10	0	2	1	3	0	226	926
05:15:00 PM	7	5	0	0	7	11	4	0	25	0	10	0	2	1	6	0	219	927
05:20:00 PM	4	5	0	0	5	11	4	0	20	4	6	0	0	4	6	0	218	913
05:25:00 PM	8	14	1	0	5	9	10	0	21	0	7	0	0	4	8	0	234	924
05:30:00 PM	0	9	0	0	7	11	5	0	20	0	18	0	3	1	3	0	233	922
05:35:00 PM	3	7	0	0	6	11	2	0	18	2	10	0	0	2	7	0	232	913
05:40:00 PM	3	6	3	0	5	14	3	0	12	2	10	0	0	1	11	0	215	895
05:45:00 PM	3	5	0	0	2	4	6	0	24	5	8	0	1	2	4	0	202	887
05:50:00 PM	5	4	0	0	3	11	4	0	22	4	11	0	2	1	5	0	206	875
05:55:00 PM	2	3	0	0	6	5	8	0	42	1	15	0	0	2	6	0	226	901

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*S Mulino Rd*
E/W street	*SE 1st Ave*
City, State	Canby OR
Site Notes	
Location	45.270684 - -122.661902
Start Date	Thursday, August 23, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:40:00 PM
Peak 15 Min Start	04:55:00 PM
PHF (15-Min Int)	0.86



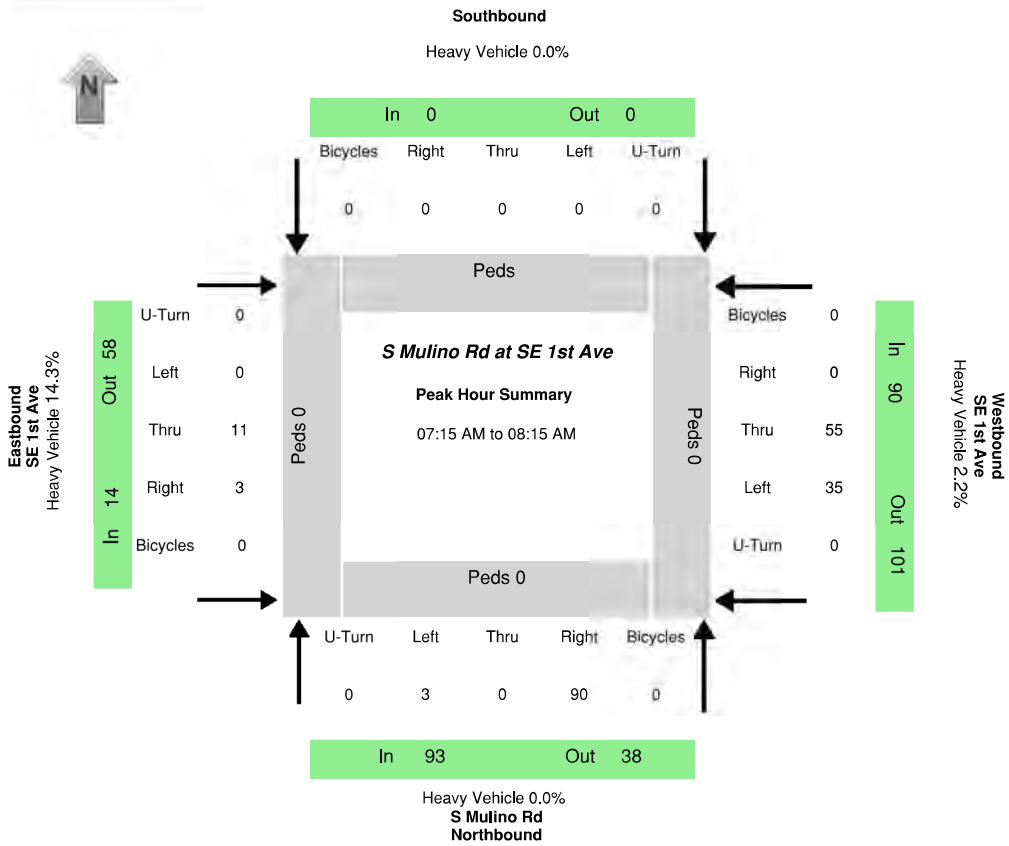
Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
3	0	56	0	0	0	0	0	0	64	5	0	123	40	0	0	59	0	69	163	128	0	43	120
Percent Heavy Vehicles																							
0.0%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%	20.0%	0.0%	0.0%	2.5%	0.0%	0.0%	1.7%	0.0%	4.3%	0.6%	0.8%	0.0%	2.3%	2.5%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				Southbound				Eastbound				Westbound					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0		0	0						0	0	0	0	0		0	0	0		0	0	0

All Vehicle Volumes																		
	Northbound				Southbound				Eastbound				Westbound					
	S Mulino Rd								SE 1st Ave				SE 1st Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
04:00:00 PM	1		4	0						4	0	0	8	7		0		
04:05:00 PM	0		4	0						4	0	0	8	3		0		
04:10:00 PM	0		6	0						2	1	0	9	8		0	69	
04:15:00 PM	0		4	0						4	2	0	15	0		0	70	
04:20:00 PM	0		3	0						5	0	0	5	3		0	67	
04:25:00 PM	0		4	0						5	0	0	9	4		0	63	
04:30:00 PM	2		3	0						3	0	0	5	4		0	55	
04:35:00 PM	1		1	0						4	0	0	12	1		0	58	
04:40:00 PM	0		5	0						13	1	0	14	5		0	74	
04:45:00 PM	0		3	0						1	0	0	9	1		0	71	
04:50:00 PM	1		2	0						4	2	0	11	5		0	77	
04:55:00 PM	0		6	0						3	0	0	11	6		0	65	271
05:00:00 PM	0		6	0						9	1	0	10	3		0	80	276
05:05:00 PM	0		7	0						9	0	0	13	1		0	85	287
05:10:00 PM	2		3	0						5	0	0	12	3		0	84	286
05:15:00 PM	0		5	0						5	1	0	8	5		0	79	285
05:20:00 PM	0		3	0						4	0	0	7	4		0	67	287
05:25:00 PM	0		3	0						3	0	0	11	1		0	60	283
05:30:00 PM	0		7	0						3	0	0	10	1		0	57	287
05:35:00 PM	0		6	0						5	0	0	7	5		0	62	291
05:40:00 PM	0		5	0						2	0	0	8	5		0	64	273
05:45:00 PM	2		2	0						5	2	0	13	2		0	69	285
05:50:00 PM	1		3	0						3	0	0	9	2		0	64	278
05:55:00 PM	0		1	0						3	0	0	15	2		0	65	273

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*S Mulino Rd*
E/W street	*SE 1st Ave*
City, State	Canby OR
Site Notes	
Location	45.270684 - -122.661902
Start Date	Thursday, August 23, 2018
Start Time	07:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:15:00 AM
Peak 15 Min Start	07:20:00 AM
PHF (15-Min Int)	0.82



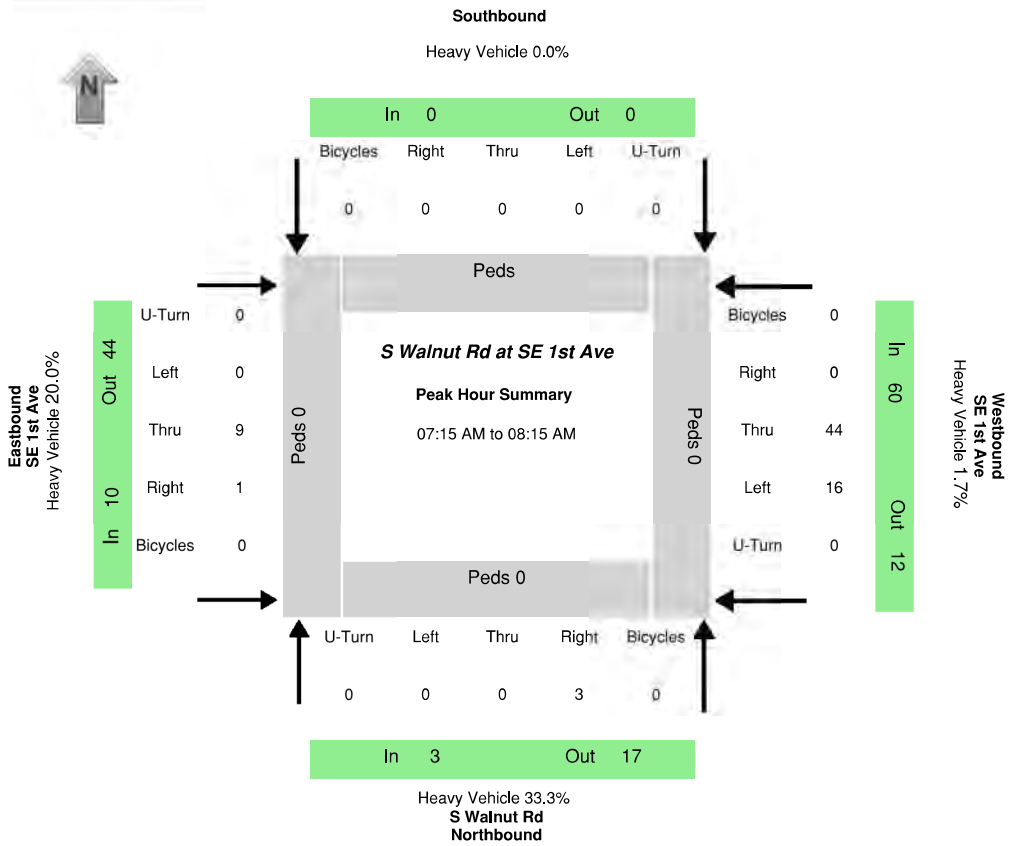
Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
3	0	90	0	0	0	0	0	0	11	3	0	35	55	0	0	93	0	14	90	38	0	58	101
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.2%	0.0%	0.0%	0.0%	3.6%	0.0%	0.0%	0.0%	0.0%	14.3%	2.2%	0.0%	0.0%	3.4%	2.0%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				Southbound				Eastbound				Westbound					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0		0	0						0	0	0	0	0		0	0	0		0	0	0

All Vehicle Volumes																		
	Northbound				Southbound				Eastbound				Westbound					
	S Mulino Rd								SE 1st Ave				SE 1st Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
07:00:00 AM	0		14	0						0	0	0	2	0		0		
07:05:00 AM	1		6	0						0	0	0	2	1		0		
07:10:00 AM	1		11	0						1	0	0	0	2		0	41	
07:15:00 AM	0		4	0						0	0	0	2	4		0	35	
07:20:00 AM	0		14	0						1	0	0	4	7		0	51	
07:25:00 AM	1		13	0						1	0	0	2	6		0	59	
07:30:00 AM	0		7	0						1	0	0	0	3		0	60	
07:35:00 AM	0		12	0						2	0	0	2	4		0	54	
07:40:00 AM	0		8	0						1	2	0	5	4		0	51	
07:45:00 AM	0		4	0						2	0	0	2	7		0	55	
07:50:00 AM	1		6	0						1	0	0	3	4		0	50	
07:55:00 AM	0		3	0						0	0	0	2	5		0	40	191
08:00:00 AM	1		2	0						1	0	0	7	2		0	38	188
08:05:00 AM	0		9	0						1	1	0	2	4		0	40	195
08:10:00 AM	0		8	0						0	0	0	4	5		0	47	197
08:15:00 AM	0		3	0						1	0	0	4	2		0	44	197
08:20:00 AM	0		4	0						2	0	0	5	4		0	42	186
08:25:00 AM	0		5	0						2	1	0	1	5		0	39	177
08:30:00 AM	0		5	0						1	1	0	1	2		0	39	176
08:35:00 AM	0		2	0						2	0	0	3	6		0	37	169
08:40:00 AM	0		13	0						3	0	0	0	2		0	41	167
08:45:00 AM	0		7	0						0	0	0	1	3		0	42	163
08:50:00 AM	0		4	0						1	0	0	3	4		0	41	160
08:55:00 AM	2		6	0						1	1	0	1	2		0	36	163

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*S Walnut Rd*
E/W street	*SE 1st Ave*
City, State	Canby OR
Site Notes	
Location	45.270232 - -122.665326
Start Date	Thursday, August 23, 2018
Start Time	07:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:15:00 AM
Peak 15 Min Start	07:35:00 AM
PHF (15-Min Int)	0.87



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	3	0	0	0	0	0	0	9	1	0	16	44	0	0	3	0	10	60	17	0	44	12

Percent Heavy Vehicles

0.0%	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.1%	100.0%	0.0%	0.0%	2.3%	0.0%	0.0%	33.3%	0.0%	20.0%	1.7%	5.9%	0.0%	2.3%	16.7%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0		0	0						0	0	0	0	0		0	0

PHV - Pedestrians

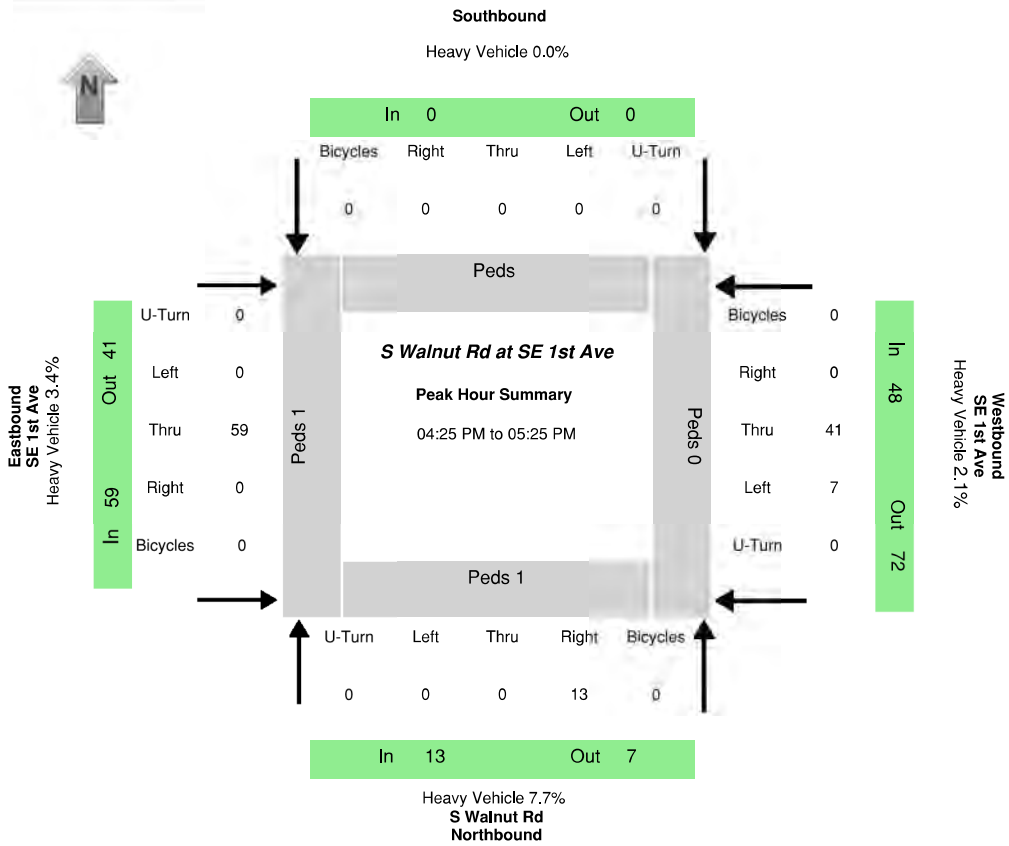
in Crosswalk				
NB	SB	EB	WB	**Sum**
0		0	0	0

All Vehicle Volumes

	Northbound S Walnut Rd				Southbound				Eastbound SE 1st Ave				Westbound SE 1st Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
07:00:00 AM	0		0	0						0	0	0	0	2		0		
07:05:00 AM	0		0	0						0	0	0	0	1		0		
07:10:00 AM	0		0	0						1	0	0	0	3		0	7	
07:15:00 AM	0		0	0						0	1	0	2	2		0	10	
07:20:00 AM	0		0	0						1	0	0	2	4		0	16	
07:25:00 AM	0		0	0						1	0	0	1	6		0	20	
07:30:00 AM	0		1	0						0	0	0	0	4		0	20	
07:35:00 AM	0		1	0						0	0	0	2	2		0	18	
07:40:00 AM	0		0	0						3	0	0	1	2		0	16	
07:45:00 AM	0		0	0						1	0	0	2	7		0	21	
07:50:00 AM	0		0	0						1	0	0	2	2		0	21	
07:55:00 AM	0		0	0						0	0	0	2	4		0	21	64
08:00:00 AM	0		1	0						0	0	0	0	3		0	15	66
08:05:00 AM	0		0	0						2	0	0	1	3		0	16	71
08:10:00 AM	0		0	0						0	0	0	1	5		0	16	73
08:15:00 AM	0		0	0						2	0	0	0	1		0	15	71
08:20:00 AM	0		0	0						1	1	0	1	4		0	16	71
08:25:00 AM	1		1	0						2	0	0	0	4		0	18	71
08:30:00 AM	0		0	0						2	0	0	1	1		0	19	70
08:35:00 AM	0		0	0						3	0	0	2	3		0	20	73
08:40:00 AM	0		1	0						1	0	0	0	1		0	15	70
08:45:00 AM	0		0	0						0	0	0	1	2		0	14	63
08:50:00 AM	0		0	0						2	0	0	1	3		0	12	64
08:55:00 AM	0		0	0						1	0	0	0	4		0	14	63

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*S Walnut Rd*
E/W street	*SE 1st Ave*
City, State	Canby OR
Site Notes	
Location	45.270232 - -122.665326
Start Date	Thursday, August 23, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:25:00 PM
Peak 15 Min Start	04:30:00 PM
PHF (15-Min Int)	0.86



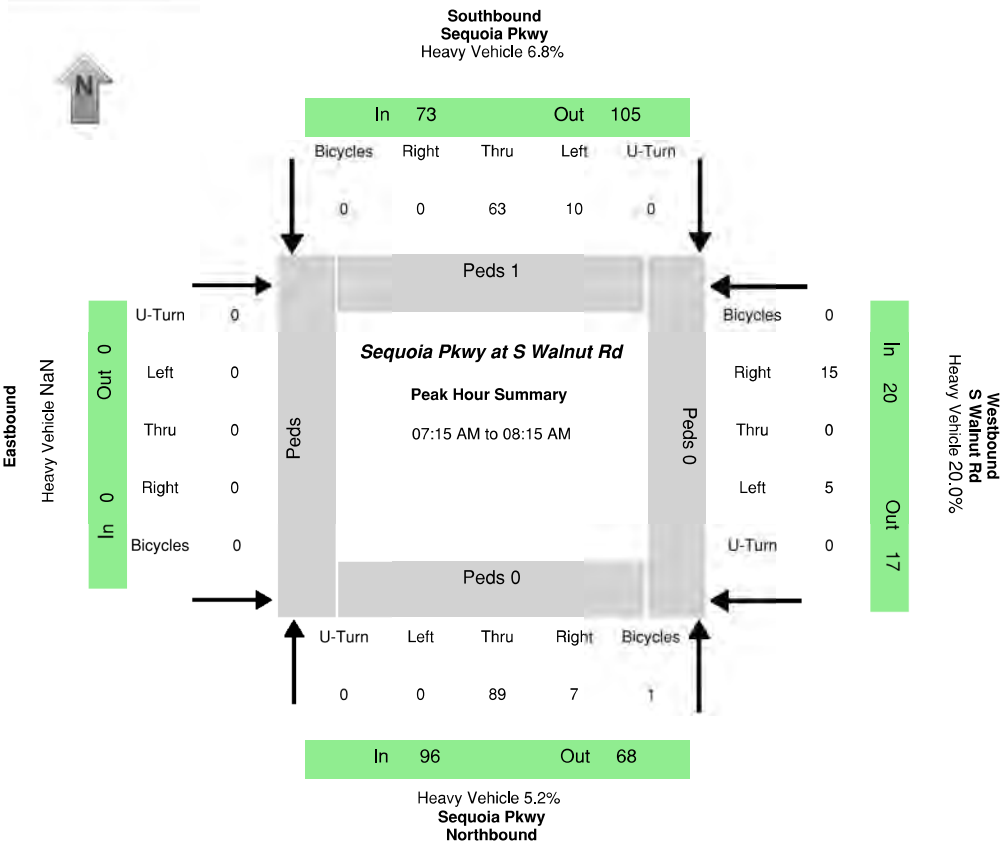
Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	13	0	0	0	0	0	0	59	0	0	7	41	0	0	13	0	59	48	7	0	41	72
Percent Heavy Vehicles																							
0.0%	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	7.7%	0.0%	3.4%	2.1%	14.3%	0.0%	0.0%	4.2%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0		0	0						0	0	0	0	0		0	0	1		1	0	2

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	S Walnut Rd								SE 1st Ave				SE 1st Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
04:00:00 PM	0		2	0						3	0	0	1	7		0		
04:05:00 PM	0		1	0						2	0	0	0	3		0		
04:10:00 PM	0		1	0						0	0	0	1	6		0	27	
04:15:00 PM	0		0	0						6	0	0	0	1		0	21	
04:20:00 PM	0		1	0						6	0	0	1	2		0	25	
04:25:00 PM	0		0	0						5	0	0	0	3		0	25	
04:30:00 PM	0		1	0						1	0	0	1	4		0	25	
04:35:00 PM	0		2	0						4	0	0	1	3		0	25	
04:40:00 PM	0		0	0						13	0	0	0	5		0	35	
04:45:00 PM	0		1	0						0	0	0	1	1		0	31	
04:50:00 PM	0		0	0						5	0	0	0	6		0	32	
04:55:00 PM	0		0	0						4	0	0	2	4		0	24	111
05:00:00 PM	0		3	0						6	0	0	1	1		0	32	109
05:05:00 PM	0		2	0						9	0	0	0	1		0	33	115
05:10:00 PM	0		3	0						3	0	0	0	5		0	34	118
05:15:00 PM	0		1	0						4	0	0	0	2		0	30	118
05:20:00 PM	0		0	0						5	0	0	1	6		0	30	120
05:25:00 PM	0		1	0						1	0	0	0	1		0	22	115
05:30:00 PM	0		1	0						2	1	0	1	0		0	20	113
05:35:00 PM	0		1	0						5	0	0	3	2		0	19	114
05:40:00 PM	0		0	0						1	0	0	1	2		0	20	100
05:45:00 PM	0		1	0						6	0	0	0	5		0	27	109
05:50:00 PM	0		0	0						3	0	0	1	3		0	23	105
05:55:00 PM	0		0	0						3	0	0	0	0		0	22	98

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Sequoia Pkwy*
E/W street	*S Walnut Rd*
City, State	Canby OR
Site Notes	
Location	45.264274 - -122.66673
Start Date	Thursday, August 23, 2018
Start Time	07:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:15:00 AM
Peak 15 Min Start	07:15:00 AM
PHF (15-Min Int)	0.88



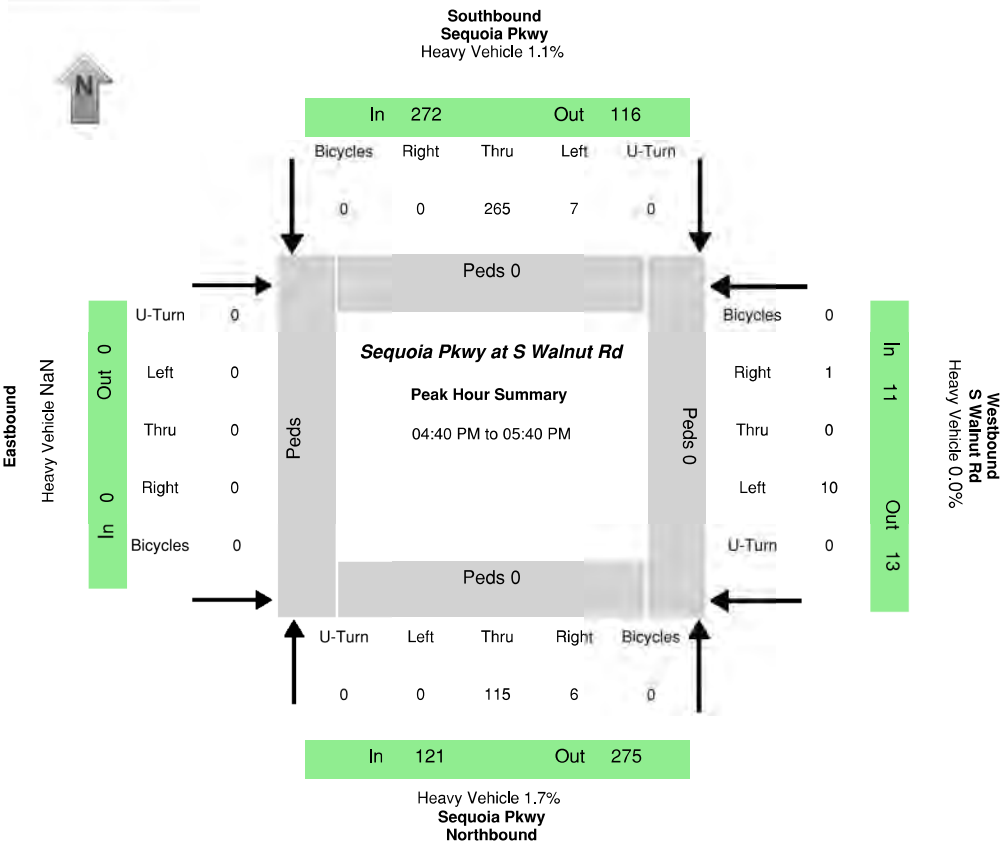
Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	89	7	0	10	63	0	0	0	0	0	0	5	0	15	0	96	73	0	20	68	104	0	17
Percent Heavy Vehicles																							
0.0%	5.6%	0.0%	0.0%	30.0%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	20.0%	0.0%	5.2%	6.8%	NaN	20.0%	4.4%	7.7%	NaN	17.6%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				Southbound				Eastbound				Westbound					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
	1	0	0	0	0		0					0		0	0	1	0	1		0	1

All Vehicle Volumes																		
	Northbound				Southbound				Eastbound				Westbound					
	Sequoia Pkwy				Sequoia Pkwy								S Walnut Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
07:00:00 AM		4	0	0	1	2		0					0		1	0		
07:05:00 AM		4	0	0	0	4		0					0		0	0		
07:10:00 AM		7	0	0	2	4		0					0		2	0	31	
07:15:00 AM		7	0	0	2	3		0					1		1	0	37	
07:20:00 AM		6	2	0	1	4		0					0		3	0	45	
07:25:00 AM		12	1	0	1	8		0					2		0	0	54	
07:30:00 AM		7	1	0	1	2		0					0		0	0	51	
07:35:00 AM		11	1	0	0	2		0					0		2	0	51	
07:40:00 AM		9	0	0	1	7		0					0		0	0	44	
07:45:00 AM		6	0	0	0	7		0					2		0	0	48	
07:50:00 AM		7	0	0	2	4		0					0		2	0	47	
07:55:00 AM		6	1	0	2	5		0					0		5	0	49	178
08:00:00 AM		3	0	0	0	9		0					0		0	0	46	182
08:05:00 AM		5	0	0	0	6		0					0		1	0	43	186
08:10:00 AM		10	1	0	0	6		0					0		1	0	42	189
08:15:00 AM		4	0	0	0	5		0					1		2	0	42	187
08:20:00 AM		7	0	0	1	7		0					2		1	0	48	189
08:25:00 AM		11	1	0	1	5		0					0		0	0	48	183
08:30:00 AM		5	0	0	0	2		0					0		0	0	43	179
08:35:00 AM		2	0	0	1	3		0					0		1	0	32	170
08:40:00 AM		2	0	0	0	5		0					0		1	0	22	161
08:45:00 AM		5	1	0	0	8		0					1		0	0	30	161
08:50:00 AM		11	0	0	0	4		0					0		3	0	41	164
08:55:00 AM		5	0	0	0	3		0					3		0	0	44	156

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Sequoia Pkwy*
E/W street	*S Walnut Rd*
City, State	Canby OR
Site Notes	
Location	45.264274 - -122.66673
Start Date	Thursday, August 23, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:40:00 PM
Peak 15 Min Start	05:25:00 PM
PHF (15-Min Int)	0.84



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	115	6	0	7	265	0	0	0	0	0	0	10	0	1	0	121	272	0	11	275	116	0	13

Percent Heavy Vehicles

0.0%	0.9%	16.7%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	1.1%	NaN	0.0%	1.1%	0.9%	NaN	7.7%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
	0	0	0	0	0		0					0		0	0	0

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	**Sum**
0	0		0	0

All Vehicle Volumes

	Northbound Sequoia Pkwy				Southbound Sequoia Pkwy				Eastbound				Westbound S Walnut Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
04:00:00 PM		14	0	0	2	18		0					1		2	0		
04:05:00 PM		11	1	0	0	21		0					0		0	0		
04:10:00 PM		7	0	0	0	14		0					1		0	0	92	
04:15:00 PM		14	0	0	0	24		0					0		2	0	95	
04:20:00 PM		8	0	0	2	19		0					0		1	0	92	
04:25:00 PM		7	0	0	1	15		0					1		1	0	95	
04:30:00 PM		10	0	0	1	12		0					1		1	0	80	
04:35:00 PM		12	3	0	0	17		0					2		0	0	84	
04:40:00 PM		9	0	0	0	22		0					0		0	0	90	
04:45:00 PM		12	0	0	1	19		0					1		0	0	98	
04:50:00 PM		9	0	0	0	18		0					0		0	0	91	
04:55:00 PM		6	0	0	0	20		0					1		0	0	87	364
05:00:00 PM		11	2	0	2	23		0					1		0	0	93	366
05:05:00 PM		8	1	0	2	25		0					0		0	0	102	369
05:10:00 PM		13	0	0	0	15		0					0		0	0	103	375
05:15:00 PM		10	0	0	0	26		0					0		1	0	101	372
05:20:00 PM		9	0	0	0	16		0					1		0	0	91	368
05:25:00 PM		16	1	0	0	19		0					0		0	0	99	379
05:30:00 PM		6	2	0	0	28		0					1		0	0	99	391
05:35:00 PM		6	0	0	2	34		0					5		0	0	120	404
05:40:00 PM		8	0	0	0	15		0					1		0	0	108	397
05:45:00 PM		10	0	0	1	17		0					1		0	0	100	393
05:50:00 PM		4	0	0	0	17		0					1		0	0	75	388
05:55:00 PM		3	1	0	0	26		0					1		1	0	83	393

Appendix C: Intersection Capacity Worksheets

Existing Conditions:

AM Peak Hour

HCM Signalized Intersection Capacity Analysis
6: OR 99E & Redwood St/Sequoia Pkwy

11/01/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	15	50	172	14	57	24	732	79	59	546	4
Future Volume (vph)	11	15	50	172	14	57	24	732	79	59	546	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1640		3335	1900	1369	1736	3343	1568	1641	3310	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1640		3335	1900	1369	1736	3343	1568	1641	3310	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	17	56	191	16	63	27	813	88	66	607	4
RTOR Reduction (vph)	0	50	0	0	0	54	0	0	50	0	1	0
Lane Group Flow (vph)	12	23	0	191	16	9	27	813	38	66	610	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	2%	5%	0%	18%	4%	8%	3%	10%	9%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases						8			6			
Actuated Green, G (s)	7.8	7.8		10.6	10.6	10.6	2.4	32.3	32.3	6.8	36.7	
Effective Green, g (s)	7.8	7.8		10.6	10.6	10.6	2.4	32.3	32.3	6.8	36.7	
Actuated g/C Ratio	0.10	0.10		0.14	0.14	0.14	0.03	0.43	0.43	0.09	0.49	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	5.5	5.5	2.3	5.5	
Lane Grp Cap (vph)	187	170		471	268	193	55	1441	676	148	1621	
v/s Ratio Prot	0.01	c0.01		c0.06	0.01		0.02	c0.24		c0.04	0.18	
v/s Ratio Perm						0.01			0.02			
v/c Ratio	0.06	0.13		0.41	0.06	0.05	0.49	0.56	0.06	0.45	0.38	
Uniform Delay, d1	30.3	30.5		29.3	27.8	27.8	35.6	16.0	12.4	32.3	11.9	
Progression Factor	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	0.2		0.3	0.1	0.1	4.0	0.9	0.1	1.2	0.4	
Delay (s)	30.3	30.7		29.6	27.9	27.8	39.6	17.0	12.5	33.5	12.3	
Level of Service	C	C		C	C	C	D	B	B	C	B	
Approach Delay (s)		30.6			29.1			17.2			14.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	74.9	Sum of lost time (s)	17.4
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
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 (vph)	231	16	17	19	9	3	7	874	10	4	625	76
Future Volume (vph)	231	16	17	19	9	3	7	874	10	4	625	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.97		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1701		1719	1580		1583	3371		1031	3438	1568
Flt Permitted	0.75	1.00		0.73	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1409	1701		1326	1580		1583	3371		1031	3438	1568
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	260	18	19	21	10	3	8	982	11	4	702	85
RTOR Reduction (vph)	0	13	0	0	2	0	0	1	0	0	0	46
Lane Group Flow (vph)	260	24	0	21	11	0	8	992	0	4	702	39
Heavy Vehicles (%)	1%	0%	6%	5%	11%	33%	14%	7%	0%	75%	5%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)	19.8	19.8		19.8	19.8		0.8	30.0		0.8	30.0	30.0
Effective Green, g (s)	19.8	19.8		19.8	19.8		0.8	30.0		0.8	30.0	30.0
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.01	0.46		0.01	0.46	0.46
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	5.4		2.3	5.4	5.4
Lane Grp Cap (vph)	428	517		403	480		19	1553		12	1584	722
v/s Ratio Prot		0.01			0.01		c0.01	c0.29		0.00	0.20	
v/s Ratio Perm	c0.18			0.02								0.02
v/c Ratio	0.61	0.05		0.05	0.02		0.42	0.64		0.33	0.44	0.05
Uniform Delay, d1	19.3	16.0		16.0	15.9		31.9	13.4		31.9	11.9	9.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.1	0.0		0.0	0.0		8.5	1.3		9.3	0.5	0.1
Delay (s)	21.4	16.0		16.1	15.9		40.5	14.7		41.2	12.4	9.8
Level of Service	C	B		B	B		D	B		D	B	A
Approach Delay (s)		20.7			16.0			14.9			12.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	65.1	Sum of lost time (s)	14.5
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	5.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	11	3	45	57	3	110
Future Vol, veh/h	11	3	45	57	3	110
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	82	82	82	82	82	82
Heavy Vehicles, %	18	0	0	4	0	0
Mvmt Flow	13	4	55	70	4	134

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	17	0	194	15
Stage 1	-	-	-	-	15	-
Stage 2	-	-	-	-	179	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1613	-	799	1070
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	857	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1613	-	771	1070
Mov Cap-2 Maneuver	-	-	-	-	771	-
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1059	-	-	1613	-
HCM Lane V/C Ratio	0.13	-	-	0.034	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	23	111	10	7	72
Future Vol, veh/h	30	23	111	10	7	72
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	89	89	89	89	89	89
Heavy Vehicles, %	10	0	3	17	0	4
Mvmt Flow	34	26	125	11	8	81

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	227	130	0	0	136	0
Stage 1	130	-	-	-	-	-
Stage 2	97	-	-	-	-	-
Critical Hdwy	6.5	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	744	925	-	-	1461	-
Stage 1	877	-	-	-	-	-
Stage 2	907	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	740	925	-	-	1461	-
Mov Cap-2 Maneuver	740	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	902	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	810	1461	-
HCM Lane V/C Ratio	-	-	0.074	0.005	-
HCM Control Delay (s)	-	-	9.8	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	0	42	2	0	9
Future Vol, veh/h	2	0	42	2	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	125	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	0	2	0	0	8
Mvmt Flow	3	0	53	3	0	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	3	0	112	3
Stage 1	-	-	-	-	3	-
Stage 2	-	-	-	-	109	-
Critical Hdwy	-	-	4.12	-	6.4	6.28
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.372
Pot Cap-1 Maneuver	-	-	1619	-	890	1064
Stage 1	-	-	-	-	1025	-
Stage 2	-	-	-	-	921	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1619	-	861	1064
Mov Cap-2 Maneuver	-	-	-	-	861	-
Stage 1	-	-	-	-	1025	-
Stage 2	-	-	-	-	891	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	1064	-	-	1619	-
HCM Lane V/C Ratio	-	0.011	-	-	0.033	-
HCM Control Delay (s)	0	8.4	-	-	7.3	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	90	9	29	2	17	48	20	105	9	61	74	18
Future Vol, veh/h	90	9	29	2	17	48	20	105	9	61	74	18
Conflicting Peds, #/hr	3	0	0	0	0	3	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	-	-	Free
Storage Length	0	-	80	120	-	-	150	-	-	130	-	130
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	0	0	6	10	10	11	0	16	7
Mvmt Flow	101	10	33	2	19	54	22	118	10	69	83	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	427	393	42	352	388	126	83	0	0	128	0	0
Stage 1	220	220	-	168	168	-	-	-	-	-	-	-
Stage 2	207	173	-	184	220	-	-	-	-	-	-	-
Critical Hdwy	7.345	6.5	6.9	7.3	6.5	6.29	4.25	-	-	4.1	-	-
Critical Hdwy Stg 1	6.545	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.145	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5285	4	3.3	3.5	4	3.357	2.295	-	-	2.2	-	-
Pot Cap-1 Maneuver	522	546	1026	595	550	912	1460	-	-	1470	-	0
Stage 1	760	725	-	839	763	-	-	-	-	-	-	0
Stage 2	792	760	-	806	725	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	454	512	1026	541	516	909	1460	-	-	1466	-	-
Mov Cap-2 Maneuver	454	512	-	541	516	-	-	-	-	-	-	-
Stage 1	749	691	-	826	752	-	-	-	-	-	-	-
Stage 2	713	749	-	733	691	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	10.3	1.1	3.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	1460	-	-	454	829	541	758	1466	-
HCM Lane V/C Ratio	0.015	-	-	0.223	0.052	0.004	0.096	0.047	-
HCM Control Delay (s)	7.5	-	-	15.2	9.6	11.7	10.3	7.6	-
HCM Lane LOS	A	-	-	C	A	B	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0.2	0	0.3	0.1	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	15	89	7	10	63
Future Vol, veh/h	5	15	89	7	10	63
Conflicting Peds, #/hr	1	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	88	88	92	92	92	92
Heavy Vehicles, %	20	20	6	0	30	3
Mvmt Flow	6	17	97	8	11	68

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	192	101	0	0	104	0
Stage 1	101	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.4	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.48	-	-	2.47	-
Pot Cap-1 Maneuver	758	907	-	-	1330	-
Stage 1	880	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	750	907	-	-	1330	-
Mov Cap-2 Maneuver	744	-	-	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	880	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	1.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	860	1330	-
HCM Lane V/C Ratio	-	-	0.026	0.008	-
HCM Control Delay (s)	-	-	9.3	7.7	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	15.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	138	1042	61	58	627
Future Vol, veh/h	76	138	1042	61	58	627
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	0	-	-	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	7	0	7	2	5	6
Mvmt Flow	88	160	1212	71	67	729

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1746	641	0	0	1283	0
Stage 1	1247	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Critical Hdwy	6.94	6.9	-	-	4.2	-
Critical Hdwy Stg 1	5.94	-	-	-	-	-
Critical Hdwy Stg 2	5.94	-	-	-	-	-
Follow-up Hdwy	3.57	3.3	-	-	2.25	-
Pot Cap-1 Maneuver	~ 73	422	-	-	521	-
Stage 1	225	-	-	-	-	-
Stage 2	561	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 64	422	-	-	521	-
Mov Cap-2 Maneuver	~ 64	-	-	-	-	-
Stage 1	225	-	-	-	-	-
Stage 2	489	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	137.3	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	64	422	521	-
HCM Lane V/C Ratio	-	-	1.381	0.38	0.129	-
HCM Control Delay (s)	-	-	$ 352.6	18.7	12.9	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	7.5	1.7	0.4	-

Notes

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

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	10	1	16	44	0	4
Future Vol, veh/h	10	1	16	44	0	4
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	87	87	87	87	87	87
Heavy Vehicles, %	11	100	0	2	0	33
Mvmt Flow	11	1	18	51	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	13	0	99	12
Stage 1	-	-	-	-	12	-
Stage 2	-	-	-	-	87	-
Critical Hdwy	-	-	4.1	-	6.4	6.53
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.597
Pot Cap-1 Maneuver	-	-	1619	-	905	985
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	941	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1619	-	895	985
Mov Cap-2 Maneuver	-	-	-	-	895	-
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	931	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	985	-	-	1619	-
HCM Lane V/C Ratio	0.005	-	-	0.011	-
HCM Control Delay (s)	8.7	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Existing Conditions:

PM Peak Hour

HCM Signalized Intersection Capacity Analysis
6: OR 99E & Redwood St/Sequoia Pkwy

11/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	71	39	321	59	93	62	764	114	131	1015	19
Future Volume (vph)	6	71	39	321	59	93	62	764	114	131	1015	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1756		3467	1900	1553	1736	3438	1553	1787	3464	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1756		3467	1900	1553	1736	3438	1553	1787	3464	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	7	78	43	353	65	102	68	840	125	144	1115	21
RTOR Reduction (vph)	0	14	0	0	0	85	0	0	76	0	1	0
Lane Group Flow (vph)	7	107	0	353	65	17	68	840	49	144	1135	0
Heavy Vehicles (%)	0%	1%	5%	1%	0%	4%	4%	5%	4%	1%	4%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases						8			6			
Actuated Green, G (s)	13.7	13.7		16.5	16.5	16.5	7.7	40.0	40.0	13.5	45.8	
Effective Green, g (s)	13.7	13.7		16.5	16.5	16.5	7.7	40.0	40.0	13.5	45.8	
Actuated g/C Ratio	0.14	0.14		0.16	0.16	0.16	0.08	0.40	0.40	0.13	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	5.5	5.5	2.3	5.5	
Lane Grp Cap (vph)	244	237		565	310	253	132	1360	614	238	1569	
v/s Ratio Prot	0.00	c0.06		c0.10	0.03		0.04	0.24		c0.08	c0.33	
v/s Ratio Perm						0.01			0.03			
v/c Ratio	0.03	0.45		0.62	0.21	0.07	0.52	0.62	0.08	0.61	0.72	
Uniform Delay, d1	37.9	40.2		39.4	36.7	35.8	44.9	24.4	19.1	41.3	22.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.8		1.7	0.2	0.1	2.1	1.3	0.1	3.4	2.2	
Delay (s)	38.0	41.0		41.2	36.8	35.8	47.0	25.8	19.2	44.7	24.7	
Level of Service	D	D		D	D	D	D	C	B	D	C	
Approach Delay (s)		40.9			39.6			26.4			27.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	101.1	Sum of lost time (s)	17.4
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
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 (vph)	184	21	19	15	28	1	18	955	13	4	1048	258
Future Volume (vph)	184	21	19	15	28	1	18	955	13	4	1048	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.99		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1723		1687	1890		1805	3459		1444	3438	1599
Flt Permitted	0.74	1.00		0.73	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1388	1723		1296	1890		1805	3459		1444	3438	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	192	22	20	16	29	1	19	995	14	4	1092	269
RTOR Reduction (vph)	0	15	0	0	1	0	0	1	0	0	0	124
Lane Group Flow (vph)	192	27	0	16	29	0	19	1008	0	4	1092	145
Heavy Vehicles (%)	1%	0%	5%	7%	0%	0%	0%	4%	15%	25%	5%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)	16.7	16.7		16.7	16.7		2.1	40.5		0.8	39.2	39.2
Effective Green, g (s)	16.7	16.7		16.7	16.7		2.1	40.5		0.8	39.2	39.2
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.03	0.56		0.01	0.54	0.54
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	5.4		2.3	5.4	5.4
Lane Grp Cap (vph)	319	396		298	435		52	1932		15	1858	864
v/s Ratio Prot		0.02			0.02		c0.01	0.29		0.00	c0.32	
v/s Ratio Perm	c0.14			0.01								0.09
v/c Ratio	0.60	0.07		0.05	0.07		0.37	0.52		0.27	0.59	0.17
Uniform Delay, d1	24.9	21.8		21.7	21.8		34.5	10.0		35.6	11.2	8.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	0.1		0.1	0.0		2.5	0.5		5.5	0.8	0.2
Delay (s)	27.6	21.9		21.8	21.9		37.1	10.5		41.1	12.0	8.6
Level of Service	C	C		C	C		D	B		D	B	A
Approach Delay (s)		26.6			21.8			11.0			11.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	69	5	126	45	3	56
Future Vol, veh/h	69	5	126	45	3	56
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	86	86	86	86	86	86
Heavy Vehicles, %	3	20	0	3	0	0
Mvmt Flow	80	6	147	52	3	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	86	0	428	83
Stage 1	-	-	-	-	83	-
Stage 2	-	-	-	-	345	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1523	-	588	982
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	722	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1523	-	530	982
Mov Cap-2 Maneuver	-	-	-	-	530	-
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	651	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.6	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	941	-	-	1523	-
HCM Lane V/C Ratio	0.073	-	-	0.096	-
HCM Control Delay (s)	9.1	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	13	91	34	14	155
Future Vol, veh/h	16	13	91	34	14	155
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	89	89	89	89	89	89
Heavy Vehicles, %	13	0	1	6	7	5
Mvmt Flow	18	15	102	38	16	174

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	327	121	0	0	140	0
Stage 1	121	-	-	-	-	-
Stage 2	206	-	-	-	-	-
Critical Hdwy	6.53	6.2	-	-	4.17	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.3	-	-	2.263	-
Pot Cap-1 Maneuver	645	936	-	-	1413	-
Stage 1	878	-	-	-	-	-
Stage 2	803	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	637	936	-	-	1413	-
Mov Cap-2 Maneuver	637	-	-	-	-	-
Stage 1	878	-	-	-	-	-
Stage 2	793	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	743	1413	-
HCM Lane V/C Ratio	-	-	0.044	0.011	-
HCM Control Delay (s)	-	-	10.1	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	8	1	41	0	2	53
Future Vol, veh/h	8	1	41	0	2	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	125	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	13	0	0	0	0
Mvmt Flow	9	1	48	0	2	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	11	0	106	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	96	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1621	-	897	1077
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	933	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1621	-	870	1077
Mov Cap-2 Maneuver	-	-	-	-	870	-
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	905	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	870	1077	-	-	1621	-
HCM Lane V/C Ratio	0.003	0.058	-	-	0.03	-
HCM Control Delay (s)	9.1	8.5	-	-	7.3	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	26.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	274	26	126	13	30	86	63	113	3	82	121	53
Future Vol, veh/h	274	26	126	13	30	86	63	113	3	82	121	53
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	-	-	Free
Storage Length	0	-	80	120	-	-	150	-	-	130	-	130
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	2	0	2	0	3	2	0
Mvmt Flow	288	27	133	14	32	91	66	119	3	86	127	56

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	614	555	64	503	553	121	127	0	0	122	0	0
Stage 1	300	300	-	253	253	-	-	-	-	-	-	-
Stage 2	314	255	-	250	300	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.5	6.9	7.3	6.5	6.23	4.1	-	-	4.145	-	-
Critical Hdwy Stg 1	6.515	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4	3.3	3.5	4	3.319	2.2	-	-	2.2285	-	-
Pot Cap-1 Maneuver	392	443	994	469	444	930	1472	-	-	1457	-	0
Stage 1	687	669	-	756	701	-	-	-	-	-	-	0
Stage 2	699	700	-	738	669	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	307	398	994	356	399	930	1472	-	-	1457	-	-
Mov Cap-2 Maneuver	307	398	-	356	399	-	-	-	-	-	-	-
Stage 1	656	630	-	722	670	-	-	-	-	-	-	-
Stage 2	574	669	-	576	630	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	51.9	11.7	2.7	3.1
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	1472	-	-	307	791	356	692	1457	-
HCM Lane V/C Ratio	0.045	-	-	0.939	0.202	0.038	0.176	0.059	-
HCM Control Delay (s)	7.6	-	-	74.8	10.7	15.5	11.3	7.6	-
HCM Lane LOS	A	-	-	F	B	C	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	9.3	0.8	0.1	0.6	0.2	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	1	115	6	7	265
Future Vol, veh/h	10	1	115	6	7	265
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	84	84	84	84	84	84
Heavy Vehicles, %	0	0	1	17	0	1
Mvmt Flow	12	1	137	7	8	315

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	472	140	0	0	144	0
Stage 1	140	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	554	913	-	-	1451	-
Stage 1	892	-	-	-	-	-
Stage 2	731	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	550	913	-	-	1451	-
Mov Cap-2 Maneuver	608	-	-	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	726	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	627	1451	-
HCM Lane V/C Ratio	-	-	0.021	0.006	-
HCM Control Delay (s)	-	-	10.9	7.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	9.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	72	987	101	142	1274
Future Vol, veh/h	48	72	987	101	142	1274
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	0	-	-	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	1	2	1	0	3
Mvmt Flow	50	75	1028	105	148	1327

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2040	567	0	0	1133	0
Stage 1	1081	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Critical Hdwy	6.84	6.92	-	-	4.1	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.31	-	-	2.2	-
Pot Cap-1 Maneuver	~ 49	469	-	-	624	-
Stage 1	287	-	-	-	-	-
Stage 2	333	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 37	469	-	-	624	-
Mov Cap-2 Maneuver	~ 37	-	-	-	-	-
Stage 1	287	-	-	-	-	-
Stage 2	254	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	183.3	0	1.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	37	469	624	-
HCM Lane V/C Ratio	-	-	1.351	0.16	0.237	-
HCM Control Delay (s)	-	-	$ 437.1	14.1	12.6	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	5.2	0.6	0.9	-

Notes

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

Existing Plus Background Growth:
AM Peak Hour

HCM Signalized Intersection Capacity Analysis
6: OR 99E & Redwood St/Sequoia Pkwy

11/01/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	28	53	190	18	69	25	769	118	96	573	4
Future Volume (vph)	12	28	53	190	18	69	25	769	118	96	573	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1677		3335	1900	1369	1736	3343	1568	1641	3310	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1677		3335	1900	1369	1736	3343	1568	1641	3310	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	31	59	211	20	77	28	854	131	107	637	4
RTOR Reduction (vph)	0	50	0	0	0	67	0	0	74	0	0	0
Lane Group Flow (vph)	13	40	0	211	20	10	28	854	57	107	641	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	2%	5%	0%	18%	4%	8%	3%	10%	9%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases						8			6			
Actuated Green, G (s)	8.5	8.5		11.5	11.5	11.5	2.5	37.2	37.2	11.5	46.2	
Effective Green, g (s)	8.5	8.5		11.5	11.5	11.5	2.5	37.2	37.2	11.5	46.2	
Actuated g/C Ratio	0.10	0.10		0.13	0.13	0.13	0.03	0.43	0.43	0.13	0.54	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	5.5	5.5	2.3	5.5	
Lane Grp Cap (vph)	178	165		445	253	182	50	1444	677	219	1776	
v/s Ratio Prot	0.01	c0.02		c0.06	0.01		0.02	c0.26		c0.07	0.19	
v/s Ratio Perm						0.01			0.04			
v/c Ratio	0.07	0.24		0.47	0.08	0.06	0.56	0.59	0.08	0.49	0.36	
Uniform Delay, d1	35.2	35.8		34.5	32.7	32.6	41.3	18.7	14.4	34.6	11.5	
Progression Factor	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	0.4		0.5	0.1	0.1	10.0	1.1	0.1	1.0	0.3	
Delay (s)	35.3	36.3		35.0	32.7	32.6	51.2	19.8	14.5	35.6	11.8	
Level of Service	D	D		C	C	C	D	B	B	D	B	
Approach Delay (s)		36.1			34.2			19.9			15.2	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	17.4
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
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 (vph)	243	20	33	20	10	3	11	923	11	4	675	80
Future Volume (vph)	243	20	33	20	10	3	11	923	11	4	675	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.97		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1659		1719	1589		1583	3371		1031	3438	1568
Flt Permitted	0.75	1.00		0.72	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1408	1659		1300	1589		1583	3371		1031	3438	1568
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	273	22	37	22	11	3	12	1037	12	4	758	90
RTOR Reduction (vph)	0	25	0	0	2	0	0	1	0	0	0	49
Lane Group Flow (vph)	273	34	0	22	12	0	12	1048	0	4	758	41
Heavy Vehicles (%)	1%	0%	6%	5%	11%	33%	14%	7%	0%	75%	5%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)	21.6	21.6		21.6	21.6		0.9	31.6		0.9	31.6	31.6
Effective Green, g (s)	21.6	21.6		21.6	21.6		0.9	31.6		0.9	31.6	31.6
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.01	0.46		0.01	0.46	0.46
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	5.4		2.3	5.4	5.4
Lane Grp Cap (vph)	443	522		409	500		20	1552		13	1583	722
v/s Ratio Prot		0.02			0.01		c0.01	c0.31		0.00	0.22	
v/s Ratio Perm	c0.19			0.02								0.03
v/c Ratio	0.62	0.06		0.05	0.02		0.60	0.68		0.31	0.48	0.06
Uniform Delay, d1	20.0	16.4		16.4	16.2		33.7	14.5		33.5	12.8	10.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.2	0.0		0.0	0.0		32.0	1.7		7.7	0.5	0.1
Delay (s)	22.2	16.5		16.4	16.2		65.7	16.1		41.2	13.3	10.3
Level of Service	C	B		B	B		E	B		D	B	B
Approach Delay (s)		21.1			16.3			16.7			13.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	14.5
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	18	3	47	81	5	116
Future Vol, veh/h	18	3	47	81	5	116
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	82	82	82	82	82	82
Heavy Vehicles, %	18	0	0	4	0	0
Mvmt Flow	22	4	57	99	6	141

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	26	0	237	24
Stage 1	-	-	-	-	24	-
Stage 2	-	-	-	-	213	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1601	-	756	1058
Stage 1	-	-	-	-	1004	-
Stage 2	-	-	-	-	827	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1601	-	727	1058
Mov Cap-2 Maneuver	-	-	-	-	727	-
Stage 1	-	-	-	-	1004	-
Stage 2	-	-	-	-	796	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1038	-	-	1601	-
HCM Lane V/C Ratio	0.142	-	-	0.036	-
HCM Control Delay (s)	9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	24	121	13	7	91
Future Vol, veh/h	38	24	121	13	7	91
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	89	89	89	89	89	89
Heavy Vehicles, %	10	0	3	17	0	4
Mvmt Flow	43	27	136	15	8	102

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	261	143	0	0	151	0
Stage 1	143	-	-	-	-	-
Stage 2	118	-	-	-	-	-
Critical Hdwy	6.5	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	711	910	-	-	1442	-
Stage 1	865	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	707	910	-	-	1442	-
Mov Cap-2 Maneuver	707	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	774	1442	-
HCM Lane V/C Ratio	-	-	0.09	0.005	-
HCM Control Delay (s)	-	-	10.1	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	6.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	0	57	5	0	12
Future Vol, veh/h	3	0	57	5	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	125	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	0	2	0	0	8
Mvmt Flow	4	0	72	6	0	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	4	0	155	4
Stage 1	-	-	-	-	4	-
Stage 2	-	-	-	-	151	-
Critical Hdwy	-	-	4.12	-	6.4	6.28
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.372
Pot Cap-1 Maneuver	-	-	1618	-	841	1062
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	882	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1618	-	803	1062
Mov Cap-2 Maneuver	-	-	-	-	803	-
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	842	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.7	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	1062	-	-	1618	-
HCM Lane V/C Ratio	-	0.014	-	-	0.045	-
HCM Control Delay (s)	0	8.4	-	-	7.3	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	95	9	30	3	18	60	21	121	12	108	115	19
Future Vol, veh/h	95	9	30	3	18	60	21	121	12	108	115	19
Conflicting Peds, #/hr	3	0	0	0	0	3	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	-	-	Free
Storage Length	0	-	80	120	-	-	150	-	-	130	-	130
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	0	0	6	10	10	11	0	16	7
Mvmt Flow	107	10	34	3	20	67	24	136	13	121	129	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	609	569	65	502	562	146	129	0	0	149	0	0
Stage 1	372	372	-	190	190	-	-	-	-	-	-	-
Stage 2	237	197	-	312	372	-	-	-	-	-	-	-
Critical Hdwy	7.345	6.5	6.9	7.3	6.5	6.29	4.25	-	-	4.1	-	-
Critical Hdwy Stg 1	6.545	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.145	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5285	4	3.3	3.5	4	3.357	2.295	-	-	2.2	-	-
Pot Cap-1 Maneuver	391	435	992	470	439	889	1403	-	-	1445	-	0
Stage 1	619	622	-	816	747	-	-	-	-	-	-	0
Stage 2	763	742	-	679	622	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	320	392	992	411	395	886	1403	-	-	1441	-	-
Mov Cap-2 Maneuver	320	392	-	411	395	-	-	-	-	-	-	-
Stage 1	608	570	-	802	734	-	-	-	-	-	-	-
Stage 2	672	729	-	590	570	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.4	11.1	1	3.7
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	1403	-	-	320	733	411	689	1441	-
HCM Lane V/C Ratio	0.017	-	-	0.334	0.06	0.008	0.127	0.084	-
HCM Control Delay (s)	7.6	-	-	21.8	10.2	13.8	11	7.7	-
HCM Lane LOS	A	-	-	C	B	B	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.4	0.2	0	0.4	0.3	-

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	17	104	10	11	87
Future Vol, veh/h	13	17	104	10	11	87
Conflicting Peds, #/hr	1	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	88	88	92	92	92	92
Heavy Vehicles, %	20	20	6	0	30	3
Mvmt Flow	15	19	113	11	12	95

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	237	118	0	0	124	0
Stage 1	118	-	-	-	-	-
Stage 2	119	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.4	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.48	-	-	2.47	-
Pot Cap-1 Maneuver	713	887	-	-	1307	-
Stage 1	864	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	705	887	-	-	1307	-
Mov Cap-2 Maneuver	714	-	-	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	854	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	803	1307	-
HCM Lane V/C Ratio	-	-	0.042	0.009	-
HCM Control Delay (s)	-	-	9.7	7.8	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	23.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	148	1099	64	73	677
Future Vol, veh/h	80	148	1099	64	73	677
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	0	-	-	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	7	0	7	2	5	6
Mvmt Flow	93	172	1278	74	85	787

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1878	676	0	0	1352	0
Stage 1	1315	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Critical Hdwy	6.94	6.9	-	-	4.2	-
Critical Hdwy Stg 1	5.94	-	-	-	-	-
Critical Hdwy Stg 2	5.94	-	-	-	-	-
Follow-up Hdwy	3.57	3.3	-	-	2.25	-
Pot Cap-1 Maneuver	~ 60	401	-	-	489	-
Stage 1	206	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 50	401	-	-	489	-
Mov Cap-2 Maneuver	~ 50	-	-	-	-	-
Stage 1	206	-	-	-	-	-
Stage 2	430	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	218	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	50	401	489	-
HCM Lane V/C Ratio	-	-	1.86	0.429	0.174	-
HCM Control Delay (s)	-	-	$ 583.3	20.6	13.9	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	9.2	2.1	0.6	-

Notes

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

Existing Plus Background Growth:
PM Peak Hour

HCM Signalized Intersection Capacity Analysis
6: OR 99E & Redwood St/Sequoia Pkwy

11/01/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	75	41	369	73	130	65	802	132	151	1066	20
Future Volume (vph)	6	75	41	369	73	130	65	802	132	151	1066	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1757		3467	1900	1553	1736	3438	1553	1787	3464	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1757		3467	1900	1553	1736	3438	1553	1787	3464	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	7	82	45	405	80	143	71	881	145	166	1171	22
RTOR Reduction (vph)	0	14	0	0	0	119	0	0	88	0	1	0
Lane Group Flow (vph)	7	113	0	405	80	24	71	881	57	166	1192	0
Heavy Vehicles (%)	0%	1%	5%	1%	0%	4%	4%	5%	4%	1%	4%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases						8			6			
Actuated Green, G (s)	14.2	14.2		18.4	18.4	18.4	8.0	42.8	42.8	15.3	50.1	
Effective Green, g (s)	14.2	14.2		18.4	18.4	18.4	8.0	42.8	42.8	15.3	50.1	
Actuated g/C Ratio	0.13	0.13		0.17	0.17	0.17	0.07	0.40	0.40	0.14	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	5.5	5.5	2.3	5.5	
Lane Grp Cap (vph)	237	230		590	323	264	128	1361	614	252	1605	
v/s Ratio Prot	0.00	c0.06		c0.12	0.04		0.04	0.26		c0.09	c0.34	
v/s Ratio Perm						0.02			0.04			
v/c Ratio	0.03	0.49		0.69	0.25	0.09	0.55	0.65	0.09	0.66	0.74	
Uniform Delay, d1	40.9	43.6		42.1	38.9	37.8	48.3	26.5	20.5	43.9	23.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	1.0		2.9	0.2	0.1	3.6	1.6	0.2	5.1	2.4	
Delay (s)	41.0	44.6		45.0	39.1	37.9	52.0	28.1	20.6	49.1	26.2	
Level of Service	D	D		D	D	D	D	C	C	D	C	
Approach Delay (s)		44.4			42.6			28.7			29.0	
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	0.70		
Actuated Cycle Length (s)	108.1	Sum of lost time (s)	17.4
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
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 (vph)	193	23	26	16	32	1	33	1021	14	4	1107	271
Future Volume (vph)	193	23	26	16	32	1	33	1021	14	4	1107	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1704		1687	1892		1805	3459		1444	3438	1599
Flt Permitted	0.73	1.00		0.72	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1383	1704		1285	1892		1805	3459		1444	3438	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	201	24	27	17	33	1	34	1064	15	4	1153	282
RTOR Reduction (vph)	0	21	0	0	1	0	0	1	0	0	0	128
Lane Group Flow (vph)	201	30	0	17	33	0	34	1078	0	4	1153	154
Heavy Vehicles (%)	1%	0%	5%	7%	0%	0%	0%	4%	15%	25%	5%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)	17.9	17.9		17.9	17.9		3.8	46.3		0.8	43.3	43.3
Effective Green, g (s)	17.9	17.9		17.9	17.9		3.8	46.3		0.8	43.3	43.3
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.05	0.58		0.01	0.54	0.54
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	5.4		2.3	5.4	5.4
Lane Grp Cap (vph)	311	383		289	425		86	2014		14	1872	870
v/s Ratio Prot		0.02			0.02		c0.02	c0.31		0.00	c0.34	
v/s Ratio Perm	c0.15			0.01								0.10
v/c Ratio	0.65	0.08		0.06	0.08		0.40	0.54		0.29	0.62	0.18
Uniform Delay, d1	27.9	24.3		24.2	24.3		36.7	10.1		39.1	12.4	9.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	0.1		0.1	0.1		1.7	0.6		6.5	1.0	0.2
Delay (s)	32.0	24.4		24.2	24.4		38.5	10.6		45.5	13.4	9.4
Level of Service	C	C		C	C		D	B		D	B	A
Approach Delay (s)		30.4			24.3			11.5			12.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	91	7	132	55	4	59
Future Vol, veh/h	91	7	132	55	4	59
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	86	86	86	86	86	86
Heavy Vehicles, %	3	20	0	3	0	0
Mvmt Flow	106	8	153	64	5	69

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	114	0	481	110
Stage 1	-	-	-	-	110	-
Stage 2	-	-	-	-	371	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1488	-	548	949
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	702	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1488	-	489	949
Mov Cap-2 Maneuver	-	-	-	-	489	-
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	627	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.4	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	896	-	-	1488	-
HCM Lane V/C Ratio	0.082	-	-	0.103	-
HCM Control Delay (s)	9.4	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	14	110	42	15	169
Future Vol, veh/h	19	14	110	42	15	169
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	89	89	89	89	89	89
Heavy Vehicles, %	13	0	1	6	7	5
Mvmt Flow	21	16	124	47	17	190

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	371	147	0	0	171	0
Stage 1	147	-	-	-	-	-
Stage 2	224	-	-	-	-	-
Critical Hdwy	6.53	6.2	-	-	4.17	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.3	-	-	2.263	-
Pot Cap-1 Maneuver	608	905	-	-	1376	-
Stage 1	854	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	599	905	-	-	1376	-
Mov Cap-2 Maneuver	599	-	-	-	-	-
Stage 1	854	-	-	-	-	-
Stage 2	777	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	699	1376	-
HCM Lane V/C Ratio	-	-	0.053	0.012	-
HCM Control Delay (s)	-	-	10.4	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	11	1	46	2	2	65
Future Vol, veh/h	11	1	46	2	2	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	125	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	13	0	0	0	0
Mvmt Flow	13	1	54	2	2	76

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	14	0	125	14
Stage 1	-	-	-	-	14	-
Stage 2	-	-	-	-	111	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1617	-	875	1072
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	919	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1617	-	846	1072
Mov Cap-2 Maneuver	-	-	-	-	846	-
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	889	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	846	1072	-	-	1617	-
HCM Lane V/C Ratio	0.003	0.071	-	-	0.033	-
HCM Control Delay (s)	9.3	8.6	-	-	7.3	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	64.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	288	27	132	17	32	126	66	158	4	99	144	56
Future Vol, veh/h	288	27	132	17	32	126	66	158	4	99	144	56
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	-	-	Free
Storage Length	0	-	80	120	-	-	150	-	-	130	-	130
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	2	0	2	0	3	2	0
Mvmt Flow	303	28	139	18	34	133	69	166	4	104	152	59

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	751	669	76	605	667	168	152	0	0	171	0	0
Stage 1	360	360	-	307	307	-	-	-	-	-	-	-
Stage 2	391	309	-	298	360	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.5	6.9	7.3	6.5	6.23	4.1	-	-	4.145	-	-
Critical Hdwy Stg 1	6.515	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4	3.3	3.5	4	3.319	2.2	-	-	2.2285	-	-
Pot Cap-1 Maneuver	315	381	976	399	382	875	1441	-	-	1398	-	0
Stage 1	634	630	-	707	665	-	-	-	-	-	-	0
Stage 2	635	663	-	692	630	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	~ 225	336	976	291	337	875	1441	-	-	1398	-	-
Mov Cap-2 Maneuver	~ 225	336	-	291	337	-	-	-	-	-	-	-
Stage 1	604	583	-	673	633	-	-	-	-	-	-	-
Stage 2	486	631	-	523	583	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	148.9	12.9	2.2	3.2
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	1441	-	-	225	737	291	661	1398	-
HCM Lane V/C Ratio	0.048	-	-	1.347	0.227	0.061	0.252	0.075	-
HCM Control Delay (s)	7.6	-	-	224.9	11.3	18.2	12.3	7.8	-
HCM Lane LOS	A	-	-	F	B	C	B	A	-
HCM 95th %tile Q(veh)	0.2	-	-	16.6	0.9	0.2	1	0.2	-

Notes

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

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	1	144	15	8	293
Future Vol, veh/h	16	1	144	15	8	293
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	84	84	84	84	84	84
Heavy Vehicles, %	0	0	1	17	0	1
Mvmt Flow	19	1	171	18	10	349

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	548	180	0	0	189	0
Stage 1	180	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	501	868	-	-	1397	-
Stage 1	856	-	-	-	-	-
Stage 2	704	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	496	868	-	-	1397	-
Mov Cap-2 Maneuver	571	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	583	1397	-
HCM Lane V/C Ratio	-	-	0.035	0.007	-
HCM Control Delay (s)	-	-	11.4	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	13.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	87	1054	106	154	1345
Future Vol, veh/h	50	87	1054	106	154	1345
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	0	-	-	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	1	2	1	0	3
Mvmt Flow	52	91	1098	110	160	1401

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2174	604	0	0	1208	0
Stage 1	1153	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
Critical Hdwy	6.84	6.92	-	-	4.1	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.31	-	-	2.2	-
Pot Cap-1 Maneuver	~ 40	444	-	-	585	-
Stage 1	263	-	-	-	-	-
Stage 2	309	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 29	444	-	-	585	-
Mov Cap-2 Maneuver	~ 29	-	-	-	-	-
Stage 1	263	-	-	-	-	-
Stage 2	224	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	254.9	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	29	444	585	-
HCM Lane V/C Ratio	-	-	1.796	0.204	0.274	-
HCM Control Delay (s)	-	-	$ 672.1	15.2	13.5	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	6.1	0.8	1.1	-

Notes

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

Existing Plus Background Growth Plus Project:
AM Peak Hour

HCM Signalized Intersection Capacity Analysis
6: OR 99E & Redwood St/Sequoia Pkwy

11/01/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	28	53	207	18	82	25	769	141	112	573	4
Future Volume (vph)	12	28	53	207	18	82	25	769	141	112	573	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1677		3303	1900	1392	1736	3343	1417	1641	3310	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1677		3303	1900	1392	1736	3343	1417	1641	3310	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	31	59	230	20	91	28	854	157	124	637	4
RTOR Reduction (vph)	0	51	0	0	0	78	0	0	91	0	0	0
Lane Group Flow (vph)	13	39	0	230	20	13	28	854	66	124	641	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	2%	6%	0%	16%	4%	8%	14%	10%	9%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases						8			6			
Actuated Green, G (s)	8.6	8.6		12.3	12.3	12.3	3.9	37.2	37.2	12.4	45.7	
Effective Green, g (s)	8.6	8.6		12.3	12.3	12.3	3.9	37.2	37.2	12.4	45.7	
Actuated g/C Ratio	0.10	0.10		0.14	0.14	0.14	0.04	0.42	0.42	0.14	0.52	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	5.5	5.5	2.3	5.5	
Lane Grp Cap (vph)	176	164		462	265	194	77	1414	599	231	1720	
v/s Ratio Prot	0.01	c0.02		c0.07	0.01		0.02	c0.26		c0.08	0.19	
v/s Ratio Perm						0.01			0.05			
v/c Ratio	0.07	0.24		0.50	0.08	0.07	0.36	0.60	0.11	0.54	0.37	
Uniform Delay, d1	36.0	36.6		34.9	32.9	32.8	40.8	19.6	15.3	35.1	12.6	
Progression Factor	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	0.4		0.5	0.1	0.1	1.7	1.2	0.2	1.6	0.3	
Delay (s)	36.1	37.1		35.4	32.9	32.9	42.5	20.8	15.5	36.7	12.9	
Level of Service	D	D		D	C	C	D	C	B	D	B	
Approach Delay (s)		37.0			34.6			20.6			16.8	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	17.4
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
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 (vph)	243	21	39	20	11	3	16	931	11	4	686	80
Future Volume (vph)	243	21	39	20	11	3	16	931	11	4	686	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.90		1.00	0.97		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1602		1719	1597		1517	3371		1031	3438	1568
Flt Permitted	0.75	1.00		0.71	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1407	1602		1290	1597		1517	3371		1031	3438	1568
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	273	24	44	22	12	3	18	1046	12	4	771	90
RTOR Reduction (vph)	0	30	0	0	2	0	0	1	0	0	0	49
Lane Group Flow (vph)	273	38	0	22	13	0	18	1057	0	4	771	41
Heavy Vehicles (%)	1%	0%	11%	5%	11%	33%	19%	7%	0%	75%	5%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)	21.7	21.7		21.7	21.7		1.0	31.8		0.9	31.7	31.7
Effective Green, g (s)	21.7	21.7		21.7	21.7		1.0	31.8		0.9	31.7	31.7
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.01	0.46		0.01	0.46	0.46
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	5.4		2.3	5.4	5.4
Lane Grp Cap (vph)	443	504		406	502		22	1555		13	1581	721
v/s Ratio Prot		0.02			0.01		c0.01	c0.31		0.00	0.22	
v/s Ratio Perm	c0.19			0.02								0.03
v/c Ratio	0.62	0.08		0.05	0.03		0.82	0.68		0.31	0.49	0.06
Uniform Delay, d1	20.1	16.6		16.4	16.3		33.9	14.6		33.7	12.9	10.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.2	0.0		0.0	0.0		106.9	1.7		7.7	0.6	0.1
Delay (s)	22.2	16.6		16.5	16.3		140.8	16.3		41.4	13.5	10.4
Level of Service	C	B		B	B		F	B		D	B	B
Approach Delay (s)		21.1			16.4			18.4			13.3	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	14.5
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	5.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	20	4	47	84	6	116
Future Vol, veh/h	20	4	47	84	6	116
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	82	82	82	82	82	82
Heavy Vehicles, %	18	0	0	4	0	0
Mvmt Flow	24	5	57	102	7	141

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	29	0	244	27
Stage 1	-	-	-	-	27	-
Stage 2	-	-	-	-	217	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1597	-	749	1054
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	824	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1597	-	721	1054
Mov Cap-2 Maneuver	-	-	-	-	721	-
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	793	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1031	-	-	1597	-
HCM Lane V/C Ratio	0.144	-	-	0.036	-
HCM Control Delay (s)	9.1	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	39	24	123	14	7	93
Future Vol, veh/h	39	24	123	14	7	93
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	89	89	89	89	89	89
Heavy Vehicles, %	10	0	3	17	0	4
Mvmt Flow	44	27	138	16	8	104

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	266	146	0	0	154	0
Stage 1	146	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.5	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	706	906	-	-	1439	-
Stage 1	862	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	702	906	-	-	1439	-
Mov Cap-2 Maneuver	702	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	768	1439	-
HCM Lane V/C Ratio	-	-	0.092	0.005	-
HCM Control Delay (s)	-	-	10.2	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	7.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	0	87	5	0	51
Future Vol, veh/h	3	0	87	5	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	125	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	0	24	0	0	51
Mvmt Flow	4	0	110	6	0	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	4	0	231	4
Stage 1	-	-	-	-	4	-
Stage 2	-	-	-	-	227	-
Critical Hdwy	-	-	4.34	-	6.4	6.71
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.416	-	3.5	3.759
Pot Cap-1 Maneuver	-	-	1485	-	762	953
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	815	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1485	-	706	953
Mov Cap-2 Maneuver	-	-	-	-	706	-
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	755	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	953	-	-	1485	-
HCM Lane V/C Ratio	-	0.068	-	-	0.074	-
HCM Control Delay (s)	0	9.1	-	-	7.6	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	-	0.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	95	9	30	3	18	90	21	121	12	147	115	19
Future Vol, veh/h	95	9	30	3	18	90	21	121	12	147	115	19
Conflicting Peds, #/hr	3	0	0	0	0	3	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	-	-	Free
Storage Length	0	-	80	120	-	-	150	-	-	130	-	130
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	0	0	25	10	10	11	18	16	7
Mvmt Flow	107	10	34	3	20	101	24	136	13	165	129	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	714	657	65	590	650	146	129	0	0	149	0	0
Stage 1	460	460	-	190	190	-	-	-	-	-	-	-
Stage 2	254	197	-	400	460	-	-	-	-	-	-	-
Critical Hdwy	7.345	6.5	6.9	7.3	6.5	6.575	4.25	-	-	4.37	-	-
Critical Hdwy Stg 1	6.545	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.145	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5285	4	3.3	3.5	4	3.5375	2.295	-	-	2.371	-	-
Pot Cap-1 Maneuver	331	387	992	409	391	837	1403	-	-	1330	-	0
Stage 1	549	569	-	816	747	-	-	-	-	-	-	0
Stage 2	747	742	-	603	569	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	247	333	992	345	336	835	1403	-	-	1326	-	-
Mov Cap-2 Maneuver	247	333	-	345	336	-	-	-	-	-	-	-
Stage 1	540	498	-	802	734	-	-	-	-	-	-	-
Stage 2	626	729	-	500	498	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.5	11.7	1	4.5
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	1403	-	-	247	681	345	669	1326	-
HCM Lane V/C Ratio	0.017	-	-	0.432	0.064	0.01	0.181	0.125	-
HCM Control Delay (s)	7.6	-	-	30.2	10.7	15.5	11.6	8.1	-
HCM Lane LOS	A	-	-	D	B	C	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2	0.2	0	0.7	0.4	-

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	17	104	11	11	87
Future Vol, veh/h	14	17	104	11	11	87
Conflicting Peds, #/hr	1	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	88	88	92	92	92	92
Heavy Vehicles, %	20	20	6	0	30	3
Mvmt Flow	16	19	113	12	12	95

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	238	119	0	0	125	0
Stage 1	119	-	-	-	-	-
Stage 2	119	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.4	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.48	-	-	2.47	-
Pot Cap-1 Maneuver	712	886	-	-	1305	-
Stage 1	863	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	704	886	-	-	1305	-
Mov Cap-2 Maneuver	713	-	-	-	-	-
Stage 1	863	-	-	-	-	-
Stage 2	854	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	799	1305	-
HCM Lane V/C Ratio	-	-	0.044	0.009	-
HCM Control Delay (s)	-	-	9.7	7.8	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	25

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	149	1107	64	74	688
Future Vol, veh/h	80	149	1107	64	74	688
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	0	-	-	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	7	0	7	2	5	6
Mvmt Flow	93	173	1287	74	86	800

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1896	681	0	0	1362	0
Stage 1	1324	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Critical Hdwy	6.94	6.9	-	-	4.2	-
Critical Hdwy Stg 1	5.94	-	-	-	-	-
Critical Hdwy Stg 2	5.94	-	-	-	-	-
Follow-up Hdwy	3.57	3.3	-	-	2.25	-
Pot Cap-1 Maneuver	~ 58	398	-	-	485	-
Stage 1	204	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 48	398	-	-	485	-
Mov Cap-2 Maneuver	~ 48	-	-	-	-	-
Stage 1	204	-	-	-	-	-
Stage 2	423	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	231	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	48	398	485	-
HCM Lane V/C Ratio	-	-	1.938	0.435	0.177	-
HCM Control Delay (s)	-	-	$ 622.6	20.8	14	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	9.4	2.1	0.6	-

Notes

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

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	53	1	17	98	0	4
Future Vol, veh/h	53	1	17	98	0	4
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	87	87	87	87	87	87
Heavy Vehicles, %	11	100	0	2	0	33
Mvmt Flow	61	1	20	113	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	62	0	213	61
Stage 1	-	-	-	-	61	-
Stage 2	-	-	-	-	152	-
Critical Hdwy	-	-	4.1	-	6.4	6.53
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.597
Pot Cap-1 Maneuver	-	-	1554	-	780	924
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	881	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1554	-	769	924
Mov Cap-2 Maneuver	-	-	-	-	769	-
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	869	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	924	-	-	1554	-
HCM Lane V/C Ratio	0.005	-	-	0.013	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	37	26	0	95	20	0
Future Vol, veh/h	37	26	0	95	20	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	100	2	2	100	2
Mvmt Flow	40	28	0	103	22	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	68	0	157	54
Stage 1	-	-	-	-	54	-
Stage 2	-	-	-	-	103	-
Critical Hdwy	-	-	4.12	-	7.4	6.22
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	-	-	2.218	-	4.4	3.318
Pot Cap-1 Maneuver	-	-	1533	-	651	1013
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1533	-	651	1013
Mov Cap-2 Maneuver	-	-	-	-	651	-
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	725	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	651	-	-	1533	-
HCM Lane V/C Ratio	0.033	-	-	-	-
HCM Control Delay (s)	10.7	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	21	16	0	83	12	0
Future Vol, veh/h	21	16	0	83	12	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	17	0	90	13	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	40	0	122	32
Stage 1	-	-	-	-	32	-
Stage 2	-	-	-	-	90	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1570	-	873	1042
Stage 1	-	-	-	-	991	-
Stage 2	-	-	-	-	934	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1570	-	873	1042
Mov Cap-2 Maneuver	-	-	-	-	873	-
Stage 1	-	-	-	-	991	-
Stage 2	-	-	-	-	934	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	873	-	-	1570	-
HCM Lane V/C Ratio	0.015	-	-	-	-
HCM Control Delay (s)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	21	0	4	83	0	3
Future Vol, veh/h	21	0	4	83	0	3
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	0	4	90	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	23	0	122	23
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	99	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1592	-	873	1054
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	925	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1592	-	870	1054
Mov Cap-2 Maneuver	-	-	-	-	870	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	922	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1054	-	-	1592	-
HCM Lane V/C Ratio	0.003	-	-	0.003	-
HCM Control Delay (s)	8.4	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Existing Plus Background Growth Plus Project:
PM Peak Hour

HCM Signalized Intersection Capacity Analysis
6: OR 99E & Redwood St/Sequoia Pkwy

11/01/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	75	41	394	73	149	65	802	145	161	1066	20
Future Volume (vph)	6	75	41	394	73	149	65	802	145	161	1066	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1757		3400	1900	1553	1736	3438	1553	1770	3464	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1757		3400	1900	1553	1736	3438	1553	1770	3464	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	7	82	45	433	80	164	71	881	159	177	1171	22
RTOR Reduction (vph)	0	14	0	0	0	135	0	0	97	0	1	0
Lane Group Flow (vph)	7	113	0	433	80	29	71	881	62	177	1192	0
Heavy Vehicles (%)	0%	1%	5%	3%	0%	4%	4%	5%	4%	2%	4%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases						8			6			
Actuated Green, G (s)	14.4	14.4		19.7	19.7	19.7	8.1	43.0	43.0	16.1	51.0	
Effective Green, g (s)	14.4	14.4		19.7	19.7	19.7	8.1	43.0	43.0	16.1	51.0	
Actuated g/C Ratio	0.13	0.13		0.18	0.18	0.18	0.07	0.39	0.39	0.15	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	5.5	5.5	2.3	5.5	
Lane Grp Cap (vph)	235	228		605	338	276	127	1336	603	257	1597	
v/s Ratio Prot	0.00	c0.06		c0.13	0.04		0.04	0.26		c0.10	c0.34	
v/s Ratio Perm						0.02			0.04			
v/c Ratio	0.03	0.50		0.72	0.24	0.11	0.56	0.66	0.10	0.69	0.75	
Uniform Delay, d1	42.0	44.7		42.8	39.0	38.1	49.5	27.8	21.5	44.9	24.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	1.0		3.6	0.2	0.1	3.7	1.8	0.2	6.5	2.5	
Delay (s)	42.0	45.7		46.4	39.2	38.2	53.3	29.5	21.7	51.4	27.0	
Level of Service	D	D		D	D	D	D	C	C	D	C	
Approach Delay (s)		45.5			43.6			29.9			30.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.6	Sum of lost time (s)	17.4
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
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 (vph)	193	24	30	16	34	1	40	1033	14	4	1113	271
Future Volume (vph)	193	24	30	16	34	1	40	1033	14	4	1113	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1695		1687	1892		1719	3459		1444	3438	1599
Flt Permitted	0.73	1.00		0.72	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1380	1695		1279	1892		1719	3459		1444	3438	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	201	25	31	17	35	1	42	1076	15	4	1159	282
RTOR Reduction (vph)	0	24	0	0	1	0	0	1	0	0	0	129
Lane Group Flow (vph)	201	32	0	17	35	0	42	1090	0	4	1159	153
Heavy Vehicles (%)	1%	0%	5%	7%	0%	0%	5%	4%	15%	25%	5%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)	18.1	18.1		18.1	18.1		4.2	46.9		0.8	43.5	43.5
Effective Green, g (s)	18.1	18.1		18.1	18.1		4.2	46.9		0.8	43.5	43.5
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.05	0.58		0.01	0.54	0.54
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	5.4		2.3	5.4	5.4
Lane Grp Cap (vph)	311	382		288	426		89	2020		14	1862	866
v/s Ratio Prot		0.02			0.02		c0.02	c0.32		0.00	c0.34	
v/s Ratio Perm	c0.15			0.01								0.10
v/c Ratio	0.65	0.08		0.06	0.08		0.47	0.54		0.29	0.62	0.18
Uniform Delay, d1	28.2	24.6		24.4	24.5		37.0	10.1		39.5	12.7	9.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	0.1		0.1	0.1		2.3	0.6		6.5	1.0	0.2
Delay (s)	32.2	24.6		24.5	24.6		39.3	10.7		45.9	13.7	9.6
Level of Service	C	C		C	C		D	B		D	B	A
Approach Delay (s)		30.6			24.6			11.8			13.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	97	9	132	58	5	59
Future Vol, veh/h	97	9	132	58	5	59
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	86	86	86	86	86	86
Heavy Vehicles, %	3	20	0	3	0	0
Mvmt Flow	113	10	153	67	6	69

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	123	0	492	118
Stage 1	-	-	-	-	118	-
Stage 2	-	-	-	-	374	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1477	-	540	939
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	700	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1477	-	482	939
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	624	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.4	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	874	-	-	1477	-
HCM Lane V/C Ratio	0.085	-	-	0.104	-
HCM Control Delay (s)	9.5	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	14	114	44	15	171
Future Vol, veh/h	20	14	114	44	15	171
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	89	89	89	89	89	89
Heavy Vehicles, %	13	0	1	6	7	5
Mvmt Flow	22	16	128	49	17	192

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	379	153	0	0	178	0
Stage 1	153	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Critical Hdwy	6.53	6.2	-	-	4.17	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.3	-	-	2.263	-
Pot Cap-1 Maneuver	602	898	-	-	1368	-
Stage 1	849	-	-	-	-	-
Stage 2	786	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	594	898	-	-	1368	-
Mov Cap-2 Maneuver	594	-	-	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	775	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	690	1368	-
HCM Lane V/C Ratio	-	-	0.055	0.012	-
HCM Control Delay (s)	-	-	10.5	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	7.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	11	1	89	2	2	88
Future Vol, veh/h	11	1	89	2	2	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	125	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	13	18	0	0	9
Mvmt Flow	13	1	105	2	2	104

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	14	0	226	14
Stage 1	-	-	-	-	14	-
Stage 2	-	-	-	-	212	-
Critical Hdwy	-	-	4.28	-	6.4	6.29
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.362	-	3.5	3.381
Pot Cap-1 Maneuver	-	-	1506	-	767	1046
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	828	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1506	-	713	1046
Mov Cap-2 Maneuver	-	-	-	-	713	-
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	770	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.4	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	713	1046	-	-	1506	-
HCM Lane V/C Ratio	0.003	0.099	-	-	0.07	-
HCM Control Delay (s)	10.1	8.8	-	-	7.6	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	95.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	288	27	132	17	32	169	66	158	4	122	144	56
Future Vol, veh/h	288	27	132	17	32	169	66	158	4	122	144	56
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	-	-	Free
Storage Length	0	-	80	120	-	-	150	-	-	130	-	130
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	10	0	2	0	7	2	0
Mvmt Flow	303	28	139	18	34	178	69	166	4	128	152	59

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	821	717	76	654	715	168	152	0	0	171	0	0
Stage 1	408	408	-	307	307	-	-	-	-	-	-	-
Stage 2	413	309	-	347	408	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.5	6.9	7.3	6.5	6.35	4.1	-	-	4.205	-	-
Critical Hdwy Stg 1	6.515	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4	3.3	3.5	4	3.395	2.2	-	-	2.2665	-	-
Pot Cap-1 Maneuver	~ 281	358	976	369	359	853	1441	-	-	1372	-	0
Stage 1	594	600	-	707	665	-	-	-	-	-	-	0
Stage 2	618	663	-	648	600	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	~ 183	309	976	264	310	853	1441	-	-	1372	-	-
Mov Cap-2 Maneuver	~ 183	309	-	264	310	-	-	-	-	-	-	-
Stage 1	566	544	-	673	633	-	-	-	-	-	-	-
Stage 2	441	631	-	478	544	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	238.3	13.4	2.2	3.6
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	1441	-	-	183	714	264	667	1372	-
HCM Lane V/C Ratio	0.048	-	-	1.657	0.234	0.068	0.317	0.094	-
HCM Control Delay (s)	7.6	-	-	$ 363.4	11.6	19.6	12.9	7.9	-
HCM Lane LOS	A	-	-	F	B	C	B	A	-
HCM 95th %tile Q(veh)	0.2	-	-	20.6	0.9	0.2	1.4	0.3	-

Notes

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

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	1	144	16	8	293
Future Vol, veh/h	18	1	144	16	8	293
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	84	84	84	84	84	84
Heavy Vehicles, %	0	0	1	17	0	1
Mvmt Flow	21	1	171	19	10	349

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	549	181	0	0	190	0
Stage 1	181	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	500	867	-	-	1396	-
Stage 1	855	-	-	-	-	-
Stage 2	704	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	496	867	-	-	1396	-
Mov Cap-2 Maneuver	571	-	-	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	581	1396	-
HCM Lane V/C Ratio	-	-	0.039	0.007	-
HCM Control Delay (s)	-	-	11.4	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	13.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	90	1066	106	155	1351
Future Vol, veh/h	50	90	1066	106	155	1351
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	0	-	-	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	1	2	1	0	3
Mvmt Flow	52	94	1110	110	161	1407

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2193	610	0	0	1221	0
Stage 1	1166	-	-	-	-	-
Stage 2	1027	-	-	-	-	-
Critical Hdwy	6.84	6.92	-	-	4.1	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.31	-	-	2.2	-
Pot Cap-1 Maneuver	~ 39	440	-	-	578	-
Stage 1	259	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 28	440	-	-	578	-
Mov Cap-2 Maneuver	~ 28	-	-	-	-	-
Stage 1	259	-	-	-	-	-
Stage 2	221	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	262.8	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	28	440	578	-
HCM Lane V/C Ratio	-	-	1.86	0.213	0.279	-
HCM Control Delay (s)	-	-	$ 708	15.4	13.6	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	6.2	0.8	1.1	-

Notes

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

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	115	8	0	91	16	0
Future Vol, veh/h	115	8	0	91	16	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	100	2	2	100	2
Mvmt Flow	125	9	0	99	17	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	134	0	228	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	99	-
Critical Hdwy	-	-	4.12	-	7.4	6.22
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	-	-	2.218	-	4.4	3.318
Pot Cap-1 Maneuver	-	-	1451	-	587	921
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1451	-	587	921
Mov Cap-2 Maneuver	-	-	-	-	587	-
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	728	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	587	-	-	1451	-
HCM Lane V/C Ratio	0.03	-	-	-	-
HCM Control Delay (s)	11.3	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	96	19	0	61	30	0
Future Vol, veh/h	96	19	0	61	30	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	104	21	0	66	33	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	125	0	181	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	66	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1462	-	808	937
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	957	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1462	-	808	937
Mov Cap-2 Maneuver	-	-	-	-	808	-
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	957	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	808	-	-	1462	-
HCM Lane V/C Ratio	0.04	-	-	-	-
HCM Control Delay (s)	9.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	96	0	4	57	4	8
Future Vol, veh/h	96	0	4	57	4	8
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	104	0	4	62	4	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	104	0	175	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	71	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1488	-	815	951
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	952	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1488	-	813	951
Mov Cap-2 Maneuver	-	-	-	-	813	-
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	949	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	900	-	-	1488	-
HCM Lane V/C Ratio	0.014	-	-	0.003	-
HCM Control Delay (s)	9.1	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Existing Plus Background Growth Plus Project with Hazeldell Extension: PM Peak Hour

HCM Signalized Intersection Capacity Analysis
6: OR 99E & Redwood St/Sequoia Pkwy

11/01/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	75	41	344	73	99	65	802	125	121	1066	20
Future Volume (vph)	6	75	41	344	73	99	65	802	125	121	1066	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1757		3400	1900	1553	1736	3438	1553	1770	3464	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1757		3400	1900	1553	1736	3438	1553	1770	3464	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	7	82	45	378	80	109	71	881	137	133	1171	22
RTOR Reduction (vph)	0	14	0	0	0	91	0	0	81	0	1	0
Lane Group Flow (vph)	7	113	0	378	80	18	71	881	56	133	1192	0
Heavy Vehicles (%)	0%	1%	5%	3%	0%	4%	4%	5%	4%	2%	4%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases						8			6			
Actuated Green, G (s)	14.2	14.2		17.8	17.8	17.8	8.0	44.0	44.0	13.3	49.3	
Effective Green, g (s)	14.2	14.2		17.8	17.8	17.8	8.0	44.0	44.0	13.3	49.3	
Actuated g/C Ratio	0.13	0.13		0.17	0.17	0.17	0.07	0.41	0.41	0.12	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.4	5.4	4.0	5.4	
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	5.5	5.5	2.3	5.5	
Lane Grp Cap (vph)	240	233		567	316	259	130	1417	640	220	1600	
v/s Ratio Prot	0.00	c0.06		c0.11	0.04		0.04	0.26		c0.08	c0.34	
v/s Ratio Perm						0.01			0.04			
v/c Ratio	0.03	0.49		0.67	0.25	0.07	0.55	0.62	0.09	0.60	0.75	
Uniform Delay, d1	40.3	42.9		41.7	38.7	37.5	47.6	24.8	19.1	44.2	23.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.9		2.5	0.2	0.1	3.2	1.3	0.1	3.6	2.5	
Delay (s)	40.3	43.8		44.2	38.9	37.5	50.8	26.1	19.3	47.8	26.0	
Level of Service	D	D		D	D	D	D	C	B	D	C	
Approach Delay (s)		43.6			42.2			26.9			28.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	106.7	Sum of lost time (s)	17.4
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
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 (vph)	193	24	30	16	34	1	40	1033	14	4	1113	271
Future Volume (vph)	193	24	30	16	34	1	40	1033	14	4	1113	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1695		1687	1892		1719	3459		1444	3438	1599
Flt Permitted	0.73	1.00		0.72	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1380	1695		1279	1892		1719	3459		1444	3438	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	201	25	31	17	35	1	42	1076	15	4	1159	282
RTOR Reduction (vph)	0	24	0	0	1	0	0	1	0	0	0	129
Lane Group Flow (vph)	201	32	0	17	35	0	42	1090	0	4	1159	153
Heavy Vehicles (%)	1%	0%	5%	7%	0%	0%	5%	4%	15%	25%	5%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)	18.1	18.1		18.1	18.1		4.2	46.9		0.8	43.5	43.5
Effective Green, g (s)	18.1	18.1		18.1	18.1		4.2	46.9		0.8	43.5	43.5
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.05	0.58		0.01	0.54	0.54
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	5.4		2.3	5.4	5.4
Lane Grp Cap (vph)	311	382		288	426		89	2020		14	1862	866
v/s Ratio Prot		0.02			0.02		c0.02	c0.32		0.00	c0.34	
v/s Ratio Perm	c0.15			0.01								0.10
v/c Ratio	0.65	0.08		0.06	0.08		0.47	0.54		0.29	0.62	0.18
Uniform Delay, d1	28.2	24.6		24.4	24.5		37.0	10.1		39.5	12.7	9.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	0.1		0.1	0.1		2.3	0.6		6.5	1.0	0.2
Delay (s)	32.2	24.6		24.5	24.6		39.3	10.7		45.9	13.7	9.6
Level of Service	C	C		C	C		D	B		D	B	A
Approach Delay (s)		30.6			24.6			11.8			13.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	11	1	29	2	60	2	40	58	30	30	10
Future Vol, veh/h	0	11	1	29	2	60	2	40	58	30	30	10
Peak Hour Factor	0.92	0.85	0.85	0.85	0.85	0.92	0.85	0.92	0.85	0.92	0.92	0.92
Heavy Vehicles, %	2	0	13	18	0	2	0	2	9	2	2	2
Mvmt Flow	0	13	1	34	2	65	2	43	68	33	33	11
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	7.5	7.9	7.8	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	0%	32%	43%
Vol Thru, %	0%	41%	92%	2%	43%
Vol Right, %	0%	59%	8%	66%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	98	12	91	70
LT Vol	2	0	0	29	30
Through Vol	0	40	11	2	30
RT Vol	0	58	1	60	10
Lane Flow Rate	2	112	14	102	76
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.003	0.135	0.017	0.122	0.094
Departure Headway (Hd)	5.245	4.363	4.397	4.324	4.429
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	675	811	817	833	814
Service Time	3.034	2.151	2.406	2.33	2.429
HCM Lane V/C Ratio	0.003	0.138	0.017	0.122	0.093
HCM Control Delay	8.1	7.8	7.5	7.9	7.9
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0.5	0.1	0.4	0.3

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	97	9	132	58	5	59
Future Vol, veh/h	97	9	132	58	5	59
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	86	86	86	86	86	86
Heavy Vehicles, %	3	20	0	3	0	0
Mvmt Flow	113	10	153	67	6	69

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	123	0	492	118
Stage 1	-	-	-	-	118	-
Stage 2	-	-	-	-	374	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1477	-	540	939
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	700	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1477	-	482	939
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	624	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.4	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	874	-	-	1477	-
HCM Lane V/C Ratio	0.085	-	-	0.104	-
HCM Control Delay (s)	9.5	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	14	114	44	15	171
Future Vol, veh/h	20	14	114	44	15	171
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	89	89	89	89	89	89
Heavy Vehicles, %	13	0	1	6	7	5
Mvmt Flow	22	16	128	49	17	192

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	379	153	0	0	178	0
Stage 1	153	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Critical Hdwy	6.53	6.2	-	-	4.17	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.3	-	-	2.263	-
Pot Cap-1 Maneuver	602	898	-	-	1368	-
Stage 1	849	-	-	-	-	-
Stage 2	786	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	594	898	-	-	1368	-
Mov Cap-2 Maneuver	594	-	-	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	775	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	690	1368	-
HCM Lane V/C Ratio	-	-	0.055	0.012	-
HCM Control Delay (s)	-	-	10.5	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	28.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	288	27	132	17	32	69	66	158	4	52	144	56
Future Vol, veh/h	288	27	132	17	32	69	66	158	4	52	144	56
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	-	-	Free
Storage Length	0	-	80	120	-	-	150	-	-	130	-	130
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	10	0	2	0	7	2	0
Mvmt Flow	303	28	139	18	34	73	69	166	4	55	152	59

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	622	570	76	506	568	168	152	0	0	171	0	0
Stage 1	261	261	-	307	307	-	-	-	-	-	-	-
Stage 2	361	309	-	199	261	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.5	6.9	7.3	6.5	6.35	4.1	-	-	4.205	-	-
Critical Hdwy Stg 1	6.515	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4	3.3	3.5	4	3.395	2.2	-	-	2.2665	-	-
Pot Cap-1 Maneuver	387	434	976	467	435	853	1441	-	-	1372	-	0
Stage 1	724	696	-	707	665	-	-	-	-	-	-	0
Stage 2	659	663	-	790	696	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	310	397	976	354	398	853	1441	-	-	1372	-	-
Mov Cap-2 Maneuver	310	397	-	354	398	-	-	-	-	-	-	-
Stage 1	689	668	-	673	633	-	-	-	-	-	-	-
Stage 2	543	631	-	623	668	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	57.5	12.4	2.2	2.1
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	1441	-	-	310	782	354	626	1372	-
HCM Lane V/C Ratio	0.048	-	-	0.978	0.214	0.051	0.17	0.04	-
HCM Control Delay (s)	7.6	-	-	83.3	10.9	15.7	11.9	7.7	-
HCM Lane LOS	A	-	-	F	B	C	B	A	-
HCM 95th %tile Q(veh)	0.2	-	-	10.2	0.8	0.2	0.6	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	1	144	16	8	293
Future Vol, veh/h	18	1	144	16	8	293
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	84	84	84	84	84	84
Heavy Vehicles, %	0	0	1	17	0	1
Mvmt Flow	21	1	171	19	10	349

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	549	181	0	0	190	0
Stage 1	181	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	500	867	-	-	1396	-
Stage 1	855	-	-	-	-	-
Stage 2	704	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	496	867	-	-	1396	-
Mov Cap-2 Maneuver	571	-	-	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	581	1396	-
HCM Lane V/C Ratio	-	-	0.039	0.007	-
HCM Control Delay (s)	-	-	11.4	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	13.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	90	1066	106	155	1351
Future Vol, veh/h	50	90	1066	106	155	1351
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	0	-	-	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	1	2	1	0	3
Mvmt Flow	52	94	1110	110	161	1407

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2193	610	0	0	1221	0
Stage 1	1166	-	-	-	-	-
Stage 2	1027	-	-	-	-	-
Critical Hdwy	6.84	6.92	-	-	4.1	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.31	-	-	2.2	-
Pot Cap-1 Maneuver	~ 39	440	-	-	578	-
Stage 1	259	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 28	440	-	-	578	-
Mov Cap-2 Maneuver	~ 28	-	-	-	-	-
Stage 1	259	-	-	-	-	-
Stage 2	221	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	262.8	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	28	440	578	-
HCM Lane V/C Ratio	-	-	1.86	0.213	0.279	-
HCM Control Delay (s)	-	-	$ 708	15.4	13.6	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	6.2	0.8	1.1	-

Notes

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

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	115	8	0	91	16	0
Future Vol, veh/h	115	8	0	91	16	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	100	2	2	100	2
Mvmt Flow	125	9	0	99	17	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	134	0	228	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	99	-
Critical Hdwy	-	-	4.12	-	7.4	6.22
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	-	-	2.218	-	4.4	3.318
Pot Cap-1 Maneuver	-	-	1451	-	587	921
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1451	-	587	921
Mov Cap-2 Maneuver	-	-	-	-	587	-
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	728	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	587	-	-	1451	-
HCM Lane V/C Ratio	0.03	-	-	-	-
HCM Control Delay (s)	11.3	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	96	19	0	61	30	0
Future Vol, veh/h	96	19	0	61	30	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	104	21	0	66	33	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	125	0	181	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	66	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1462	-	808	937
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	957	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1462	-	808	937
Mov Cap-2 Maneuver	-	-	-	-	808	-
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	957	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	808	-	-	1462	-
HCM Lane V/C Ratio	0.04	-	-	-	-
HCM Control Delay (s)	9.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	96	0	4	57	4	8
Future Vol, veh/h	96	0	4	57	4	8
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	104	0	4	62	4	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	104	0	175	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	71	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1488	-	815	951
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	952	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1488	-	813	951
Mov Cap-2 Maneuver	-	-	-	-	813	-
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	949	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	900	-	-	1488	-
HCM Lane V/C Ratio	0.014	-	-	0.003	-
HCM Control Delay (s)	9.1	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix D: Vehicle Queuing Worksheets

Existing Conditions:

AM Peak Hour

1: Mulino Rd & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.3	0.2	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Del/Veh (s)	1.0	0.2	1.2	0.5	4.7	2.4	1.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	0.1	0.0	0.1	0.1	2.2	1.6	0.8

2: SE 1st Ave & S Bremer Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.1	0.1	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	3.8	1.8	0.4	0.1	0.5	1.3	1.2
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	2.5	1.8	0.2	0.1	0.2	0.0	0.6

3: Hazeldell Way & SE 1st Ave Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.0	0.5	1.5	2.6	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	2.6	0.3

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.3	4.2	4.1	3.4	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0
Total Delay (hr)	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.4	5.5	2.9	4.9	7.0	3.9	1.5	0.3	0.0	1.9	0.1	1.0
Stop Delay (hr)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	5.2	4.2	2.6	3.3	4.7	3.4	0.2	0.0	0.0	0.3	0.0	0.0

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.4
Total Delay (hr)	0.3
Total Del/Veh (s)	2.5
Stop Delay (hr)	0.2
Stop Del/Veh (s)	1.8

5: Sequoia Pkwy & S Walnut Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.1	0.2	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	4.4	2.6	0.1	0.1	1.9	0.2	0.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	2.9	2.7	0.0	0.0	0.3	0.0	0.3

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0
Denied Del/Veh (s)	3.5	0.3	0.2	0.0	0.0	0.0	3.1	1.0	3.0	3.1	0.2	0.2
Total Delay (hr)	0.1	0.2	0.1	1.3	0.1	0.1	0.2	2.4	0.1	0.5	1.2	0.0
Total Del/Veh (s)	32.0	34.7	9.4	26.4	21.8	4.3	34.3	12.1	3.8	33.1	7.8	2.1
Stop Delay (hr)	0.1	0.1	0.1	1.2	0.1	0.1	0.2	1.1	0.0	0.5	0.6	0.0
Stop Del/Veh (s)	30.4	31.9	8.7	24.5	20.2	4.3	30.1	5.3	1.9	30.3	3.9	1.3

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	All
Denied Delay (hr)	0.4
Denied Del/Veh (s)	0.8
Total Delay (hr)	6.3
Total Del/Veh (s)	12.8
Stop Delay (hr)	4.1
Stop Del/Veh (s)	8.3

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	3.7	0.6	0.8	4.3	0.2	0.1	2.3	0.2	0.1	3.0	0.2	3.0
Total Delay (hr)	1.7	0.1	0.0	0.1	0.1	0.0	0.1	2.0	0.0	0.0	1.3	0.1
Total Del/Veh (s)	24.7	15.3	4.6	21.7	18.2	5.8	33.3	8.0	4.0	18.4	7.5	2.3
Stop Delay (hr)	1.4	0.1	0.0	0.1	0.0	0.0	0.1	0.8	0.0	0.0	0.6	0.0
Stop Del/Veh (s)	21.1	12.1	4.1	19.6	15.2	5.6	30.0	3.2	2.2	16.4	3.4	1.2

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	All
Denied Delay (hr)	0.4
Denied Del/Veh (s)	0.8
Total Delay (hr)	5.4
Total Del/Veh (s)	10.0
Stop Delay (hr)	3.2
Stop Del/Veh (s)	5.8

8: OR 99E & Haines Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.1	0.3	0.1	0.0	0.0	0.0	0.5
Denied Del/Veh (s)	5.7	7.5	0.2	0.3	2.9	0.1	1.0
Total Delay (hr)	6.9	0.4	0.3	0.0	0.2	0.1	7.8
Total Del/Veh (s)	304.0	9.8	0.9	0.3	13.8	0.5	14.1
Stop Delay (hr)	6.9	0.3	0.0	0.0	0.2	0.0	7.5
Stop Del/Veh (s)	304.5	8.9	0.0	0.0	11.6	0.0	13.4

9: Walnut Rd & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.7	0.5	0.6	0.1	2.1	0.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.6	0.0	0.0	0.0	2.1	0.1

22: Sequoia Pkwy Performance by movement

Movement	NBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	0.1	0.1
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.1	0.0

33: Hazeldell Way Performance by movement

Movement	EBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.1	0.2
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	0.0

Total Network Performance

Denied Delay (hr)	1.4
Denied Del/Veh (s)	0.8
Total Delay (hr)	23.0
Total Del/Veh (s)	13.1
Stop Delay (hr)	15.3
Stop Del/Veh (s)	8.7

Intersection: 1: Mulino Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	14	50
Average Queue (ft)	0	31
95th Queue (ft)	7	46
Link Distance (ft)	143	998
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: SE 1st Ave & S Bremer Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	67	11
Average Queue (ft)	24	0
95th Queue (ft)	47	6
Link Distance (ft)	799	590
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Hazeldell Way & SE 1st Ave

Movement	WB	NB
Directions Served	LT	R
Maximum Queue (ft)	5	44
Average Queue (ft)	0	7
95th Queue (ft)	4	30
Link Distance (ft)	1135	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sequoia Pkwy & Hazeldell Way

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	T
Maximum Queue (ft)	83	49	27	86	27	7	45	9	15
Average Queue (ft)	43	25	2	38	1	0	7	0	1
95th Queue (ft)	70	53	15	64	12	5	32	6	11
Link Distance (ft)	222							218	218
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		80	120		150		130		
Storage Blk Time (%)	0	0							
Queuing Penalty (veh)	0	0							

Intersection: 5: Sequoia Pkwy & S Walnut Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	70	29
Average Queue (ft)	17	2
95th Queue (ft)	49	17
Link Distance (ft)	1386	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	59	107	147	170	49	74	67	247	211	66	116	167
Average Queue (ft)	15	43	39	82	12	28	21	135	75	25	42	76
95th Queue (ft)	46	83	107	143	40	61	54	221	184	53	88	142
Link Distance (ft)		1089			346	346		1248				1355
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	90		180	180			115		300	300	190	
Storage Blk Time (%)		1	0	0				10	0			0
Queuing Penalty (veh)		0	0	0				45	0			0

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	SB
Directions Served	TR
Maximum Queue (ft)	128
Average Queue (ft)	41
95th Queue (ft)	97
Link Distance (ft)	1355
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: OR 99 E & NE Territorial Rd/SE Territorial Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	238	146	64	75	41	205	184	66	162	127	54
Average Queue (ft)	121	20	14	14	7	105	70	5	87	44	19
95th Queue (ft)	207	78	46	52	29	181	145	34	151	101	44
Link Distance (ft)		552		696		1093	1093		931	931	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	225		140		400			400			550
Storage Blk Time (%)	1										
Queuing Penalty (veh)	0										

Intersection: 8: OR 99E & Haines Rd

Movement	WB	WB	NB	SB
Directions Served	L	R	TR	L
Maximum Queue (ft)	459	188	15	90
Average Queue (ft)	218	77	1	30
95th Queue (ft)	506	278	7	69
Link Distance (ft)	566	566	507	
Upstream Blk Time (%)	6	4		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)				340
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Walnut Rd & SE 1st Ave

Movement	NB
Directions Served	LR
Maximum Queue (ft)	46
Average Queue (ft)	5
95th Queue (ft)	28
Link Distance (ft)	848
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 22: Sequoia Pkwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 33: Hazeldell Way

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 46

Existing Conditions:

PM Peak Hour

1: Mulino Rd & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	1.3	0.2	1.5	1.2	7.4	1.9	1.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.3	0.1	5.4	1.7	0.5

2: SE 1st Ave & S Bremer Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.2	0.2	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Del/Veh (s)	3.6	1.3	0.5	0.2	1.0	2.2	1.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	3.1	1.6	0.1	0.1	0.4	0.0	0.2

3: Hazeldell Way & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.0	4.3	0.1	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.0	0.0	0.5	4.4	2.7	1.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	3.2	2.4	1.3

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.8	3.8	3.7	3.8	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Total Delay (hr)	1.2	0.1	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	16.2	11.1	6.2	7.4	11.3	7.4	1.8	0.5	0.1	2.1	0.1	1.1
Stop Delay (hr)	1.2	0.1	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	15.3	8.7	5.0	5.6	8.7	6.7	0.5	0.0	0.1	0.4	0.0	0.0

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	All
Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.8
Total Delay (hr)	1.9
Total Del/Veh (s)	6.6
Stop Delay (hr)	1.7
Stop Del/Veh (s)	5.7

5: Sequoia Pkwy & S Walnut Rd Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.1	0.2	0.3	0.2
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	6.2	0.0	7.5	0.2	0.0	2.4	0.6	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	4.7	0.0	7.9	0.0	0.0	0.4	0.0	0.2

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.0
Denied Del/Veh (s)	3.4	0.2	0.2	0.0	0.0	0.0	3.2	1.3	3.0	2.5	0.3	0.3
Total Delay (hr)	0.0	0.9	0.3	4.0	0.6	0.2	0.9	5.1	0.3	1.9	5.8	0.1
Total Del/Veh (s)	35.7	43.7	27.7	43.7	36.2	6.1	52.7	23.3	7.3	54.8	20.7	12.9
Stop Delay (hr)	0.0	0.8	0.3	3.7	0.6	0.1	0.7	3.0	0.1	1.7	3.5	0.0
Stop Del/Veh (s)	33.1	40.4	26.0	40.9	34.1	6.0	45.7	13.6	3.4	48.3	12.5	8.7

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	All
Denied Delay (hr)	0.6
Denied Del/Veh (s)	0.8
Total Delay (hr)	20.0
Total Del/Veh (s)	26.5
Stop Delay (hr)	14.7
Stop Del/Veh (s)	19.5

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2
Denied Del/Veh (s)	3.8	0.5	0.6	4.1	0.2	0.1	2.9	0.2	0.2	1.9	0.4	2.4
Total Delay (hr)	1.8	0.1	0.1	0.1	0.2	0.0	0.2	1.9	0.0	0.0	2.6	0.3
Total Del/Veh (s)	33.3	27.4	8.7	31.6	25.4	7.8	40.3	7.1	4.1	39.7	9.0	3.8
Stop Delay (hr)	1.6	0.1	0.0	0.1	0.2	0.0	0.2	0.7	0.0	0.0	1.1	0.1
Stop Del/Veh (s)	29.8	24.3	8.1	29.2	22.3	7.8	37.7	2.8	2.5	37.3	3.7	1.6

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	All
Denied Delay (hr)	0.6
Denied Del/Veh (s)	0.8
Total Delay (hr)	7.4
Total Del/Veh (s)	10.3
Stop Delay (hr)	4.3
Stop Del/Veh (s)	5.9

8: OR 99E & Haines Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	2.5	2.3	0.1	0.0	0.1	0.1	5.1
Denied Del/Veh (s)	197.1	121.7	0.2	0.3	2.3	0.3	6.9
Total Delay (hr)	10.6	0.6	0.3	0.0	0.7	0.2	12.5
Total Del/Veh (s)	891.0	33.8	1.1	0.7	19.1	0.5	17.1
Stop Delay (hr)	10.7	0.6	0.0	0.0	0.6	0.0	11.9
Stop Del/Veh (s)	893.5	33.2	0.0	0.0	16.3	0.0	16.3

9: Walnut Rd & SE 1st Ave Performance by movement

Movement	EBT	WBL	WBT	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.4	0.9	1.1	0.3	2.5	0.9
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.2	0.1	0.0	0.0	2.4	0.3

22: Sequoia Pkwy Performance by movement

Movement	NBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.2	0.2
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.2	0.1

33: Hazeldell Way Performance by movement

Movement	EBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.5	0.1	0.4
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	0.1

Total Network Performance

Denied Delay (hr)	6.5
Denied Del/Veh (s)	2.6
Total Delay (hr)	46.8
Total Del/Veh (s)	18.7
Stop Delay (hr)	33.0
Stop Del/Veh (s)	13.2

Intersection: 1: Mulino Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	59	45
Average Queue (ft)	10	26
95th Queue (ft)	38	44
Link Distance (ft)	143	998
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: SE 1st Ave & S Bremer Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	35	29
Average Queue (ft)	15	2
95th Queue (ft)	35	15
Link Distance (ft)	799	590
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Hazeldell Way & SE 1st Ave

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	12	30	51
Average Queue (ft)	1	3	25
95th Queue (ft)	7	16	46
Link Distance (ft)	1135		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		125	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Sequoia Pkwy & Hazeldell Way

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	R
Maximum Queue (ft)	241	105	45	104	45	10	51	24
Average Queue (ft)	114	67	13	48	9	0	13	1
95th Queue (ft)	212	120	41	82	34	5	43	12
Link Distance (ft)	222							
Upstream Blk Time (%)	2							
Queuing Penalty (veh)	0							
Storage Bay Dist (ft)		80	120		150		130	130
Storage Blk Time (%)	19	1		0				
Queuing Penalty (veh)	30	2		0				

Intersection: 5: Sequoia Pkwy & S Walnut Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	29	14
Average Queue (ft)	11	0
95th Queue (ft)	34	7
Link Distance (ft)	1386	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	55	227	230	244	158	80	260	377	372	100	273	443
Average Queue (ft)	5	86	122	145	48	32	62	218	173	37	115	215
95th Queue (ft)	31	176	197	216	106	62	150	323	301	76	229	351
Link Distance (ft)		1089			346	346		1248				1355
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	90		180	180			115		300	300	190	
Storage Blk Time (%)		12	1	3			1	28	0		2	9
Queuing Penalty (veh)		1	0	2			7	155	0		10	13

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	SB
Directions Served	TR
Maximum Queue (ft)	410
Average Queue (ft)	188
95th Queue (ft)	323
Link Distance (ft)	1355
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: OR 99 E & NE Territorial Rd/SE Territorial Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	220	78	82	63	77	222	212	37	273	231	111
Average Queue (ft)	116	23	16	25	19	100	73	4	136	90	39
95th Queue (ft)	189	59	50	57	56	175	159	22	227	188	79
Link Distance (ft)		552		696		1093	1093		931	931	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	225		140		400			400			550
Storage Blk Time (%)	0										
Queuing Penalty (veh)	0										

Intersection: 8: OR 99E & Haines Rd

Movement	WB	WB	NB	SB
Directions Served	L	R	TR	L
Maximum Queue (ft)	381	344	34	173
Average Queue (ft)	279	135	3	67
95th Queue (ft)	485	415	17	132
Link Distance (ft)	404	404	507	
Upstream Blk Time (%)	28	23		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)				340
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Walnut Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	6	49
Average Queue (ft)	0	12
95th Queue (ft)	4	40
Link Distance (ft)	846	848
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: Sequoia Pkwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 33: Hazeldell Way

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 219

Existing Plus Background Growth:
AM Peak Hour

1: Mulino Rd & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.2	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.9	0.1	1.2	0.6	4.7	2.6	1.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Stop Del/Veh (s)	0.1	0.0	0.1	0.1	2.1	1.6	0.8

2: SE 1st Ave & S Bremer Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.1	0.2	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	4.0	2.0	0.4	0.1	0.8	1.3	1.2
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	2.8	1.9	0.2	0.1	0.3	0.0	0.6

3: Hazeldell Way & SE 1st Ave Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.0	0.5	2.8	2.4	1.0
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	2.4	0.5

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.3	4.0	3.9	4.5	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.0
Total Delay (hr)	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	8.7	6.1	3.2	8.8	8.8	4.7	1.8	0.4	0.0	2.2	0.1	1.0
Stop Delay (hr)	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	7.5	4.7	2.7	6.9	6.4	4.1	0.5	0.0	0.0	0.5	0.0	0.0

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.4
Total Delay (hr)	0.5
Total Del/Veh (s)	2.9
Stop Delay (hr)	0.4
Stop Del/Veh (s)	2.1

5: Sequoia Pkwy & S Walnut Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.2	0.2	0.3	0.1	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.1	2.4	0.2	0.3	2.0	0.2	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	3.5	2.4	0.0	0.0	0.3	0.0	0.4

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.0
Denied Del/Veh (s)	3.9	0.1	0.2	0.0	0.0	0.0	3.1	1.3	3.1	3.1	0.2	0.1
Total Delay (hr)	0.1	0.3	0.2	1.7	0.2	0.1	0.3	3.4	0.2	1.0	1.4	0.0
Total Del/Veh (s)	35.8	35.5	11.6	31.5	28.2	5.8	38.9	15.9	5.6	38.6	8.7	4.5
Stop Delay (hr)	0.1	0.2	0.1	1.6	0.1	0.1	0.2	1.6	0.1	0.9	0.8	0.0
Stop Del/Veh (s)	34.0	32.7	10.6	29.5	26.6	5.7	33.9	7.4	2.5	35.1	4.8	3.2

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	All
Denied Delay (hr)	0.5
Denied Del/Veh (s)	1.0
Total Delay (hr)	8.8
Total Del/Veh (s)	16.2
Stop Delay (hr)	6.0
Stop Del/Veh (s)	11.0

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	3.7	0.6	0.7	4.3	0.2	0.1	2.3	0.2	0.2	3.1	0.2	2.9
Total Delay (hr)	1.7	0.1	0.1	0.1	0.0	0.0	0.1	2.2	0.0	0.0	1.6	0.1
Total Del/Veh (s)	25.7	17.9	6.5	24.8	13.9	7.2	31.7	8.5	3.8	38.3	8.3	2.3
Stop Delay (hr)	1.5	0.1	0.1	0.1	0.0	0.0	0.1	0.9	0.0	0.0	0.7	0.0
Stop Del/Veh (s)	22.1	14.9	5.7	22.9	11.2	6.7	29.1	3.5	2.1	36.1	3.8	1.1

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	All
Denied Delay (hr)	0.4
Denied Del/Veh (s)	0.8
Total Delay (hr)	6.1
Total Del/Veh (s)	10.6
Stop Delay (hr)	3.6
Stop Del/Veh (s)	6.2

8: OR 99E & Haines Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	6.7	12.0	0.1	0.0	0.1	0.0	18.9
Denied Del/Veh (s)	282.6	290.5	0.2	0.4	3.0	0.2	31.6
Total Delay (hr)	15.0	2.0	0.3	0.0	0.3	0.1	17.8
Total Del/Veh (s)	613.5	52.2	1.0	0.8	15.1	0.5	29.7
Stop Delay (hr)	15.2	2.0	0.0	0.0	0.3	0.0	17.4
Stop Del/Veh (s)	620.5	50.3	0.0	0.0	12.9	0.0	29.1

9: Walnut Rd & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.3	0.7	0.4	0.0	2.3	0.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.2	0.4	0.1	0.0	0.0	2.1	0.1

22: Sequoia Pkwy Performance by movement

Movement	NBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	0.1	0.2
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.1	0.0

33: Hazeldell Way Performance by movement

Movement	EBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.1	0.2
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	0.1

Total Network Performance

Denied Delay (hr)	19.9
Denied Del/Veh (s)	10.5
Total Delay (hr)	36.6
Total Del/Veh (s)	19.1
Stop Delay (hr)	27.7
Stop Del/Veh (s)	14.5

Intersection: 1: Mulino Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	19	45
Average Queue (ft)	1	31
95th Queue (ft)	8	42
Link Distance (ft)	143	998
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: SE 1st Ave & S Bremer Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	67	12
Average Queue (ft)	26	1
95th Queue (ft)	48	7
Link Distance (ft)	799	590
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Hazeldell Way & SE 1st Ave

Movement	WB	NB
Directions Served	LT	R
Maximum Queue (ft)	6	41
Average Queue (ft)	0	12
95th Queue (ft)	5	37
Link Distance (ft)	1135	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Sequoia Pkwy & Hazeldell Way

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T
Maximum Queue (ft)	104	59	35	93	32	21	61	22
Average Queue (ft)	46	27	3	39	3	1	14	1
95th Queue (ft)	85	57	18	71	19	11	47	17
Link Distance (ft)	222							218
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		80	120		150		130	
Storage Blk Time (%)	1	0		0				
Queuing Penalty (veh)	0	0		0				

Intersection: 5: Sequoia Pkwy & S Walnut Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	53	55
Average Queue (ft)	20	2
95th Queue (ft)	47	23
Link Distance (ft)	1386	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	58	114	141	160	60	110	153	401	325	124	176	200
Average Queue (ft)	14	49	51	92	15	35	24	176	116	35	75	83
95th Queue (ft)	43	94	115	145	45	78	84	290	248	89	149	157
Link Distance (ft)		1089			346	346		1248				1355
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	90		180	180			115		300	300	190	
Storage Blk Time (%)	0	2		0				15	0		0	0
Queuing Penalty (veh)	0	0		0				80	0		1	0

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	SB
Directions Served	TR
Maximum Queue (ft)	179
Average Queue (ft)	48
95th Queue (ft)	121
Link Distance (ft)	1355
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: OR 99 E & NE Territorial Rd/SE Territorial Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	234	132	60	64	56	240	206	49	198	158	52
Average Queue (ft)	120	32	17	10	11	113	84	5	97	54	17
95th Queue (ft)	201	96	49	39	39	193	169	28	169	121	42
Link Distance (ft)		552		696		1093	1093		931	931	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	225		140		400			400			550
Storage Blk Time (%)	1										
Queuing Penalty (veh)	0										

Intersection: 8: OR 99E & Haines Rd

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	454	443	20	26	105
Average Queue (ft)	416	356	1	1	42
95th Queue (ft)	489	593	9	11	86
Link Distance (ft)	411	411	507	507	
Upstream Blk Time (%)	80	70			
Queuing Penalty (veh)	0	0			
Storage Bay Dist (ft)					340
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Walnut Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	6	45
Average Queue (ft)	1	3
95th Queue (ft)	7	19
Link Distance (ft)	846	848
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: Sequoia Pkwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 33: Hazeldell Way

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 82

Existing Plus Background Growth:
PM Peak Hour

1: Mulino Rd & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.3	0.1	0.0
Total Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	1.3	0.1	1.5	0.9	4.4	2.1	1.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.1	0.4	0.1	2.7	1.7	0.5

2: SE 1st Ave & S Bremer Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.1	0.2	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Del/Veh (s)	4.5	1.1	0.6	0.1	0.8	2.0	1.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	4.1	1.3	0.1	0.1	0.4	0.0	0.3

3: Hazeldell Way & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	4.3	0.2	0.2
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.1	0.0	0.6	2.9	4.8	2.7	1.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.1	0.0	3.1	2.5	1.3

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.6	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	7.5	10.0	8.9	4.1	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0
Total Delay (hr)	2.3	0.1	0.5	0.0	0.1	0.3	0.0	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	28.6	19.0	12.0	8.4	16.7	9.7	2.1	0.6	0.1	2.3	0.1	1.2
Stop Delay (hr)	2.3	0.1	0.4	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	28.8	17.6	11.4	6.5	13.9	8.9	0.7	0.0	0.0	0.6	0.0	0.1

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	All
Denied Delay (hr)	1.1
Denied Del/Veh (s)	3.1
Total Delay (hr)	3.6
Total Del/Veh (s)	10.6
Stop Delay (hr)	3.4
Stop Del/Veh (s)	10.0

5: Sequoia Pkwy & S Walnut Rd Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.3	0.2	0.2	0.4	0.3	0.2
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Del/Veh (s)	6.9	0.0	8.2	0.2	0.1	2.4	0.6	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	5.2	0.0	7.5	0.0	0.0	0.4	0.0	0.2

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.0
Denied Del/Veh (s)	3.2	0.2	0.2	0.0	0.0	0.0	3.2	1.4	3.1	2.5	0.3	0.5
Total Delay (hr)	0.1	1.1	0.4	4.6	0.8	0.3	1.1	5.7	0.3	2.7	6.8	0.1
Total Del/Veh (s)	44.9	50.0	32.9	44.5	34.6	7.5	58.3	25.2	8.8	63.1	22.7	14.5
Stop Delay (hr)	0.1	1.0	0.3	4.3	0.7	0.3	0.9	3.3	0.2	2.3	4.0	0.1
Stop Del/Veh (s)	42.4	46.3	30.9	41.5	32.4	7.4	50.5	14.8	4.1	55.5	13.4	9.6

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	All
Denied Delay (hr)	0.7
Denied Del/Veh (s)	0.9
Total Delay (hr)	23.8
Total Del/Veh (s)	28.9
Stop Delay (hr)	17.6
Stop Del/Veh (s)	21.3

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2
Denied Del/Veh (s)	3.8	0.5	0.6	4.2	0.2	0.2	2.7	0.2	0.3	2.5	0.4	2.4
Total Delay (hr)	2.1	0.1	0.1	0.2	0.2	0.0	0.4	2.2	0.0	0.0	3.5	0.3
Total Del/Veh (s)	37.1	23.0	8.2	31.7	24.3	9.9	36.3	7.8	4.6	37.6	11.4	4.1
Stop Delay (hr)	1.9	0.1	0.1	0.1	0.2	0.0	0.3	0.9	0.0	0.0	1.6	0.1
Stop Del/Veh (s)	33.4	19.9	7.4	29.5	20.9	8.9	33.5	3.3	2.5	35.3	5.2	1.6

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	All
Denied Delay (hr)	0.6
Denied Del/Veh (s)	0.8
Total Delay (hr)	9.1
Total Del/Veh (s)	12.0
Stop Delay (hr)	5.4
Stop Del/Veh (s)	7.1

8: OR 99E & Haines Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	6.6	11.8	0.1	0.0	0.1	0.1	18.7
Denied Del/Veh (s)	495.5	505.3	0.2	0.3	2.3	0.3	24.1
Total Delay (hr)	16.7	1.5	0.4	0.0	1.0	0.2	19.8
Total Del/Veh (s)	1671.6	109.5	1.2	0.9	22.8	0.5	25.9
Stop Delay (hr)	16.8	1.5	0.0	0.0	0.9	0.0	19.2
Stop Del/Veh (s)	1675.4	107.7	0.0	0.0	19.9	0.0	25.0

9: Walnut Rd & SE 1st Ave Performance by movement

Movement	EBT	WBL	WBT	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.4	1.3	0.7	0.0	2.5	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.2	0.2	0.0	0.0	2.3	0.3

22: Sequoia Pkwy Performance by movement

Movement	NBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.2	0.2	0.2
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.2	0.1

33: Hazeldell Way Performance by movement

Movement	EBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.5	0.1	0.4
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	0.1

Total Network Performance

Denied Delay (hr)	21.1
Denied Del/Veh (s)	7.9
Total Delay (hr)	62.1
Total Del/Veh (s)	23.0
Stop Delay (hr)	46.1
Stop Del/Veh (s)	17.1

Intersection: 1: Mulino Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	57	46
Average Queue (ft)	12	26
95th Queue (ft)	40	45
Link Distance (ft)	143	998
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: SE 1st Ave & S Bremer Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	55	24
Average Queue (ft)	17	1
95th Queue (ft)	40	11
Link Distance (ft)	799	590
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Hazeldell Way & SE 1st Ave

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	16	30	57
Average Queue (ft)	1	2	28
95th Queue (ft)	7	14	47
Link Distance (ft)	1135		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		125	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Sequoia Pkwy & Hazeldell Way

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	R
Maximum Queue (ft)	247	105	35	126	56	14	61	36
Average Queue (ft)	159	82	17	60	12	1	19	1
95th Queue (ft)	271	132	45	99	43	8	55	15
Link Distance (ft)	222							
Upstream Blk Time (%)	16							
Queuing Penalty (veh)	0							
Storage Bay Dist (ft)		80	120		150		130	130
Storage Blk Time (%)	39	2		0				
Queuing Penalty (veh)	63	7		0				

Intersection: 5: Sequoia Pkwy & S Walnut Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	50	21
Average Queue (ft)	12	1
95th Queue (ft)	37	10
Link Distance (ft)	1386	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	71	220	260	267	181	110	273	451	394	154	299	507
Average Queue (ft)	8	98	137	164	57	43	76	231	185	44	140	238
95th Queue (ft)	38	188	226	245	125	79	184	367	331	100	265	410
Link Distance (ft)		1089			346	346		1248				1355
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	90		180	180			115		300	300	190	
Storage Blk Time (%)		17	2	7	0		3	30	0		6	12
Queuing Penalty (veh)		1	1	5	0		27	178	2		31	19

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	SB
Directions Served	TR
Maximum Queue (ft)	459
Average Queue (ft)	210
95th Queue (ft)	378
Link Distance (ft)	1355
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: OR 99 E & NE Territorial Rd/SE Territorial Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	236	73	72	83	87	242	236	38	321	275	92
Average Queue (ft)	130	26	19	28	30	113	86	5	162	115	40
95th Queue (ft)	216	59	55	68	72	198	169	23	273	230	76
Link Distance (ft)		552		696		1093	1093		931	931	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	225		140		400			400			550
Storage Blk Time (%)	1										
Queuing Penalty (veh)	1										

Intersection: 8: OR 99E & Haines Rd

Movement	WB	WB	NB	SB
Directions Served	L	R	TR	L
Maximum Queue (ft)	453	452	37	168
Average Queue (ft)	416	344	2	81
95th Queue (ft)	525	629	16	144
Link Distance (ft)	433	433	507	
Upstream Blk Time (%)	77	71		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)				340
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Walnut Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	15	46
Average Queue (ft)	1	11
95th Queue (ft)	8	38
Link Distance (ft)	846	848
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: Sequoia Pkwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 33: Hazeldell Way

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 336

Existing Plus Background Growth Plus Project:
AM Peak Hour

1: Mulino Rd & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.2	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Del/Veh (s)	1.0	0.0	1.2	0.6	4.2	2.8	1.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Stop Del/Veh (s)	0.0	0.0	0.1	0.1	2.1	1.7	0.8

2: SE 1st Ave & S Bremer Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.2	0.1	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	4.2	2.2	0.4	0.1	0.9	1.3	1.3
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	2.9	1.9	0.2	0.1	0.4	0.0	0.6

3: Hazeldell Way & SE 1st Ave Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.0	1.4	1.2	2.8	1.8
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	2.5	0.7

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.3	4.0	4.0	3.5	0.2	0.2	0.1	0.2	0.3	0.0	0.0	0.0
Total Delay (hr)	0.3	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	11.2	6.8	3.4	12.7	12.7	5.8	1.7	0.5	0.2	2.3	0.1	1.0
Stop Delay (hr)	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	10.1	5.1	2.9	11.0	10.3	5.0	0.4	0.0	0.0	0.6	0.0	0.0

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.4
Total Delay (hr)	0.7
Total Del/Veh (s)	3.6
Stop Delay (hr)	0.5
Stop Del/Veh (s)	2.7

5: Sequoia Pkwy & S Walnut Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.2	0.2	0.2	0.1	0.2
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.5	2.8	0.2	0.2	2.3	0.2	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	3.9	2.8	0.0	0.0	0.3	0.0	0.4

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.0
Denied Del/Veh (s)	3.7	0.1	0.2	0.0	0.0	0.0	3.1	1.4	3.1	3.0	0.2	0.1
Total Delay (hr)	0.1	0.3	0.2	1.9	0.2	0.1	0.3	3.6	0.2	1.3	1.4	0.0
Total Del/Veh (s)	33.4	38.4	13.3	33.6	17.7	5.4	46.7	16.6	6.2	39.4	8.7	2.9
Stop Delay (hr)	0.1	0.3	0.2	1.8	0.1	0.1	0.3	1.7	0.1	1.2	0.8	0.0
Stop Del/Veh (s)	31.3	35.7	12.2	31.5	16.6	5.3	40.5	8.0	2.6	35.6	4.8	2.8

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	All
Denied Delay (hr)	0.6
Denied Del/Veh (s)	1.0
Total Delay (hr)	9.8
Total Del/Veh (s)	16.8
Stop Delay (hr)	6.8
Stop Del/Veh (s)	11.6

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	3.7	0.8	0.8	4.2	0.1	0.1	2.6	0.2	0.2	2.7	0.2	2.8
Total Delay (hr)	1.7	0.1	0.1	0.1	0.1	0.0	0.1	2.2	0.0	0.0	1.7	0.1
Total Del/Veh (s)	25.8	19.4	6.6	22.7	18.6	5.1	34.1	8.6	3.8	29.3	8.8	2.6
Stop Delay (hr)	1.5	0.1	0.1	0.1	0.0	0.0	0.1	0.9	0.0	0.0	0.8	0.0
Stop Del/Veh (s)	22.2	16.2	5.5	20.7	15.9	5.0	31.5	3.5	2.0	27.1	4.1	1.3

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	All
Denied Delay (hr)	0.4
Denied Del/Veh (s)	0.8
Total Delay (hr)	6.2
Total Del/Veh (s)	10.8
Stop Delay (hr)	3.7
Stop Del/Veh (s)	6.3

8: OR 99E & Haines Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	2.7	5.9	0.1	0.0	0.1	0.0	8.8
Denied Del/Veh (s)	123.4	135.1	0.2	0.3	2.8	0.2	14.4
Total Delay (hr)	16.4	2.0	0.3	0.0	0.3	0.1	19.3
Total Del/Veh (s)	687.4	48.8	1.1	0.7	15.6	0.5	31.5
Stop Delay (hr)	16.6	2.0	0.0	0.0	0.3	0.0	18.8
Stop Del/Veh (s)	693.9	47.2	0.0	0.0	13.3	0.0	30.9

9: Walnut Rd & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.8	0.5	1.1	0.6	0.0	2.6	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.4	0.7	0.1	0.2	0.0	2.6	0.2

10: West Driveway & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBT	NBL	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.0	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.6	0.1	0.4	4.4	0.8
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	2.9	0.3

11: Center Driveway & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBT	NBL	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.4	0.0	0.3	4.3	0.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	2.8	0.2

12: East Driveway & SE 1st Ave Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.3	1.2	0.5	2.2	0.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.1	0.0	2.0	0.1

22: Sequoia Pkwy Performance by movement

Movement	NBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.1	0.2
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.1	0.0

33: Hazeldell Way Performance by movement

Movement	EBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.4	0.1	0.3
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	0.1

Total Network Performance

Denied Delay (hr)	9.9
Denied Del/Veh (s)	5.0
Total Delay (hr)	39.7
Total Del/Veh (s)	19.8
Stop Delay (hr)	30.3
Stop Del/Veh (s)	15.1

Intersection: 1: Mulino Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	26	60
Average Queue (ft)	1	32
95th Queue (ft)	10	45
Link Distance (ft)	143	998
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: SE 1st Ave & S Bremer Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	72	23
Average Queue (ft)	29	1
95th Queue (ft)	54	10
Link Distance (ft)	799	590
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Hazeldell Way & SE 1st Ave

Movement	WB	NB
Directions Served	LT	R
Maximum Queue (ft)	6	97
Average Queue (ft)	0	36
95th Queue (ft)	4	77
Link Distance (ft)	1135	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 4: Sequoia Pkwy & Hazeldell Way

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T
Maximum Queue (ft)	107	60	35	112	33	39	89	7
Average Queue (ft)	51	28	3	53	3	2	21	0
95th Queue (ft)	92	55	19	93	19	16	64	5
Link Distance (ft)	222							218
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		80	120		150		130	
Storage Blk Time (%)	2	0		0				
Queuing Penalty (veh)	1	0		0				

Intersection: 5: Sequoia Pkwy & S Walnut Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	79	32
Average Queue (ft)	21	1
95th Queue (ft)	53	13
Link Distance (ft)	1386	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	63	133	172	183	56	90	71	349	293	110	214	219
Average Queue (ft)	11	53	65	96	14	39	24	176	122	42	90	88
95th Queue (ft)	42	98	132	157	43	76	60	284	254	85	172	176
Link Distance (ft)		1089			346	346		1248				1355
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	90		180	180			115		300	300	190	
Storage Blk Time (%)	0	2	0	0				17	0		0	0
Queuing Penalty (veh)	0	0	0	0				95	0		1	0

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	SB
Directions Served	TR
Maximum Queue (ft)	182
Average Queue (ft)	45
95th Queue (ft)	115
Link Distance (ft)	1355
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: OR 99 E & NE Territorial Rd/SE Territorial Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	235	158	57	65	74	218	201	52	196	170	52
Average Queue (ft)	123	33	15	12	16	117	78	5	100	54	20
95th Queue (ft)	201	97	47	44	51	195	161	28	171	126	45
Link Distance (ft)		552		696		1093	1093		931	931	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	225		140		400			400			550
Storage Blk Time (%)	1										
Queuing Penalty (veh)	0										

Intersection: 8: OR 99E & Haines Rd

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	520	441	7	34	110
Average Queue (ft)	455	321	0	2	45
95th Queue (ft)	615	697	5	14	86
Link Distance (ft)	503	503	507	507	
Upstream Blk Time (%)	53	46			
Queuing Penalty (veh)	0	0			
Storage Bay Dist (ft)					340
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Walnut Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	7	49
Average Queue (ft)	0	4
95th Queue (ft)	7	24
Link Distance (ft)	134	848
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: West Driveway & SE 1st Ave

Movement	NB
Directions Served	LR
Maximum Queue (ft)	89
Average Queue (ft)	29
95th Queue (ft)	78
Link Distance (ft)	199
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: Center Driveway & SE 1st Ave

Movement	NB
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	12
95th Queue (ft)	38
Link Distance (ft)	207
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: East Driveway & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	6	34
Average Queue (ft)	0	3
95th Queue (ft)	4	18
Link Distance (ft)	312	200
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: Sequoia Pkwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 33: Hazeldell Way

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 99

Existing Plus Background Growth Plus Project:
PM Peak Hour

1: Mulino Rd & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Total Del/Veh (s)	1.1	0.0	1.7	1.2	6.3	2.1	1.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	0.0	0.0	0.5	0.1	4.8	1.7	0.6

2: SE 1st Ave & S Bremer Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.2	0.2	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.2
Total Del/Veh (s)	4.5	1.3	0.6	0.1	1.3	2.3	1.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	3.7	1.5	0.1	0.1	0.8	0.0	0.3

3: Hazeldell Way & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	3.1	0.1	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Del/Veh (s)	0.0	0.0	1.6	0.8	3.7	2.8	1.9
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Stop Del/Veh (s)	0.0	0.0	0.1	0.0	2.5	2.5	1.0

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.9	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	10.9	10.8	12.6	3.7	0.3	0.3	0.1	0.2	0.1	0.0	0.0	0.0
Total Delay (hr)	2.9	0.2	0.6	0.1	0.2	0.7	0.0	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	36.8	20.3	16.9	10.2	21.5	14.4	2.1	0.7	0.0	2.3	0.1	1.1
Stop Delay (hr)	3.0	0.2	0.6	0.0	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	37.9	18.7	16.8	7.9	18.7	13.6	0.7	0.0	0.0	0.6	0.0	0.0

4: Sequoia Pkwy & Hazeldell Way Performance by movement

Movement	All
Denied Delay (hr)	1.4
Denied Del/Veh (s)	4.1
Total Delay (hr)	4.8
Total Del/Veh (s)	13.5
Stop Delay (hr)	4.6
Stop Del/Veh (s)	13.1

5: Sequoia Pkwy & S Walnut Rd Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.1	0.2	0.2	0.3	0.3	0.2
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Del/Veh (s)	6.5	0.0	3.7	0.3	0.2	2.3	0.6	0.8
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	4.9	0.0	3.8	0.0	0.0	0.6	0.0	0.2

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.0
Denied Del/Veh (s)	3.2	0.2	0.2	0.0	0.0	0.0	3.0	1.5	3.1	2.5	0.3	0.4
Total Delay (hr)	0.1	1.0	0.4	5.1	0.8	0.3	1.0	5.8	0.4	3.1	6.7	0.1
Total Del/Veh (s)	45.6	49.2	28.3	45.6	33.9	7.4	56.0	25.8	9.3	66.3	22.8	15.0
Stop Delay (hr)	0.1	0.9	0.3	4.8	0.7	0.3	0.9	3.4	0.2	2.8	4.0	0.1
Stop Del/Veh (s)	42.9	45.6	26.5	42.5	31.6	7.2	48.1	15.2	4.4	58.6	13.7	10.4

6: OR 99E & Redwood St/Sequoia Pkwy Performance by movement

Movement	All
Denied Delay (hr)	0.7
Denied Del/Veh (s)	0.9
Total Delay (hr)	24.7
Total Del/Veh (s)	29.4
Stop Delay (hr)	18.4
Stop Del/Veh (s)	21.9

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2
Denied Del/Veh (s)	3.8	0.6	0.5	4.2	0.2	0.1	2.6	0.2	0.2	2.3	0.4	2.4
Total Delay (hr)	1.8	0.1	0.1	0.2	0.2	0.0	0.4	2.3	0.0	0.0	3.7	0.3
Total Del/Veh (s)	36.5	22.7	11.6	30.7	27.0	3.9	40.1	7.7	5.3	43.4	11.8	4.2
Stop Delay (hr)	1.7	0.1	0.1	0.1	0.2	0.0	0.4	0.9	0.0	0.0	1.7	0.1
Stop Del/Veh (s)	32.9	19.5	10.8	28.5	23.7	2.7	37.1	3.1	3.2	40.2	5.2	1.8

7: OR 99 E & NE Territorial Rd/SE Territorial Rd Performance by movement

Movement	All
Denied Delay (hr)	0.6
Denied Del/Veh (s)	0.8
Total Delay (hr)	9.2
Total Del/Veh (s)	11.9
Stop Delay (hr)	5.3
Stop Del/Veh (s)	6.8

8: OR 99E & Haines Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	5.2	9.4	0.1	0.0	0.1	0.1	14.9
Denied Del/Veh (s)	382.9	359.5	0.2	0.3	2.2	0.4	18.9
Total Delay (hr)	14.5	1.4	0.4	0.0	1.2	0.2	17.7
Total Del/Veh (s)	1271.2	73.9	1.2	0.9	27.5	0.6	22.7
Stop Delay (hr)	14.5	1.4	0.0	0.0	1.1	0.0	17.0
Stop Del/Veh (s)	1275.5	73.6	0.0	0.0	24.6	0.0	21.8

9: Walnut Rd & SE 1st Ave Performance by movement

Movement	EBT	WBL	WBT	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.6	1.3	0.6	0.0	2.6	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.2	0.3	0.1	0.0	2.5	0.3

10: West Site Driveway & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBT	NBL	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.0	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.4	0.1	0.4	5.2	0.8
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.1	0.1	3.5	0.3

11: Center Site Driveway & SE 1st Ave Performance by movement

Movement	EBT	EBR	WBT	NBL	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.3	0.0	0.3	4.8	0.9
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	3.2	0.4

12: East Side Driveway & SE 1st Ave Performance by movement

Movement	EBT	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.3	1.8	0.9	5.3	2.9	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	3.2	2.6	0.2

22: Sequoia Pkwy Performance by movement

Movement	NBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.2	0.2
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.2	0.1

33: Hazeldell Way Performance by movement

Movement	EBT	SBT	All
Denied Delay (hr)	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0
Total Del/Veh (s)	0.5	0.1	0.4
Stop Delay (hr)	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	0.1

Total Network Performance

Denied Delay (hr)	17.7
Denied Del/Veh (s)	6.5
Total Delay (hr)	62.4
Total Del/Veh (s)	22.5
Stop Delay (hr)	46.0
Stop Del/Veh (s)	16.6

Intersection: 1: Mulino Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	49	45
Average Queue (ft)	14	26
95th Queue (ft)	42	44
Link Distance (ft)	143	998
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: SE 1st Ave & S Bremer Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	60	43
Average Queue (ft)	17	4
95th Queue (ft)	43	23
Link Distance (ft)	799	590
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Hazeldell Way & SE 1st Ave

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	53	24	66
Average Queue (ft)	3	1	33
95th Queue (ft)	20	9	58
Link Distance (ft)	1135		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		125	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Sequoia Pkwy & Hazeldell Way

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (ft)	245	105	49	192	44	20	73	5	34
Average Queue (ft)	172	86	17	89	10	1	20	0	1
95th Queue (ft)	290	134	47	152	37	11	57	4	15
Link Distance (ft)	222							218	
Upstream Blk Time (%)	25								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)		80	120		150		130		130
Storage Blk Time (%)	49	2		4					
Queuing Penalty (veh)	78	7		1					

Intersection: 5: Sequoia Pkwy & S Walnut Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	34	42
Average Queue (ft)	14	2
95th Queue (ft)	37	19
Link Distance (ft)	1386	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	86	206	265	271	192	102	186	424	358	98	309	502
Average Queue (ft)	7	92	151	176	56	47	64	234	188	45	159	242
95th Queue (ft)	40	168	230	249	121	85	143	356	309	83	276	412
Link Distance (ft)		1089			346	346		1248				1355
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	90		180	180			115		300	300	190	
Storage Blk Time (%)		16	2	9	0		3	31	0		7	12
Queuing Penalty (veh)		1	2	7	0		32	192	1		40	20

Intersection: 6: OR 99E & Redwood St/Sequoia Pkwy

Movement	SB
Directions Served	TR
Maximum Queue (ft)	464
Average Queue (ft)	214
95th Queue (ft)	373
Link Distance (ft)	1355
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: OR 99 E & NE Territorial Rd/SE Territorial Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	235	229	72	74	97	246	211	44	331	266	104
Average Queue (ft)	120	38	18	24	32	118	90	3	166	121	42
95th Queue (ft)	200	120	55	61	75	205	184	20	275	225	78
Link Distance (ft)		552		696		1093	1093		931	931	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	225		140		400			400			550
Storage Blk Time (%)	1								0		
Queuing Penalty (veh)	0								0		

Intersection: 8: OR 99E & Haines Rd

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	410	408	32	201	89
Average Queue (ft)	366	258	2	83	3
95th Queue (ft)	472	549	14	169	64
Link Distance (ft)	389	389	507		428
Upstream Blk Time (%)	68	55			0
Queuing Penalty (veh)	0	0			0
Storage Bay Dist (ft)				340	
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				2	0

Intersection: 9: Walnut Rd & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	19	53
Average Queue (ft)	1	12
95th Queue (ft)	9	40
Link Distance (ft)	134	848
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: West Site Driveway & SE 1st Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	12	93
Average Queue (ft)	0	23
95th Queue (ft)	6	71
Link Distance (ft)	119	199
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: Center Site Driveway & SE 1st Ave

Movement	NB
Directions Served	LR
Maximum Queue (ft)	60
Average Queue (ft)	22
95th Queue (ft)	52
Link Distance (ft)	207
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: East Side Driveway & SE 1st Ave

Movement	NB
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	12
95th Queue (ft)	38
Link Distance (ft)	200
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 22: Sequoia Pkwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 33: Hazeldell Way

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 382