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MEMORANDUM

Date:	September 11, 2020	Project #: 24832
To:	Steve Adams, PE – City of Milwaukie Avi Tayar, PE – Oregon Department of Transportation Reah Flisakowski, PE – DKS Associates	
CC:	Phil Krueger, AIA, LEED AP BD+C – Yost Grube Hall Architecture [redacted]	
From:	Kristine Connolly, PE, Brian Dunn, PE, and Ali Razmpa – Kittelson & Associates, Inc.	
Project:	Waverley Woods Apartments	
Subject:	Transportation Impact Analysis	

Walker Ventures, LLC is proposing a multifamily apartment development located at 10415 SE Waverly Court. The proposed development site is part of the larger Waverley Greens Apartment complex which exists northeast of the site. The current proposal includes development of up to 100 multifamily apartment units with access via a driveway on SE Waverly Court. Future development may include up to 32 additional multifamily apartment units with access via a driveway on SE Lava Drive. The site location and overall site vicinity are shown in **Exhibit 1** and a conceptual site plan is shown in **Attachment A**. This transportation impact analysis report documents the transportation impacts associated with site development. To provide a conservative analysis, this report assumes full build-out of the site (both the current proposed and potential future development). Key findings and recommendations are summarized below.

SUMMARY OF FINDINGS

- All study intersections are forecast to operate within the applicable review agency volume-to-capacity ratio and level of service standards under existing and site build-out year 2021 conditions during the weekday AM and PM peak hours.
- Historical crash data for the study area intersections indicate no patterns or trends that require mitigation associated with the proposed development.

RECOMMENDATIONS

- Any new landscaping, above ground utilities, and signing should be located and maintained along the site frontage to maximize sight distance.

Exhibit 1. Site Vicinity Map

REPORT SCOPE

This report identifies the transportation-related impacts associated with the proposed development and was prepared in accordance with the City of Milwaukie and Oregon Department of Transportation (ODOT) requirements. Per City and ODOT staff direction, operational analyses were performed at the following study intersections during the weekday AM and PM peak periods (see **Exhibit 1**):

1. SE 17th Avenue – SE Harrison Street/SE McLoughlin Boulevard (OR-99E)
2. SE 17th Avenue/SE Lava Drive
3. SE 17th Avenue/Milwaukie Expressway (OR-224)
4. SE Lava Drive/SE Waverly Court
5. SE Waverly Court/Proposed Site Access
6. SE Lava Drive/Potential Future Site Access

This report evaluates the following transportation issues:

- Existing land use and transportation system conditions within the site vicinity during the weekday AM and PM peak periods;
- Forecast year 2021 background traffic conditions during the weekday AM and PM peak periods, considering other development and transportation improvements planned in the study area;
- Trip generation and distribution estimates for the proposed development;

- Forecast year 2021 total traffic conditions during the weekday AM and PM peak periods with build-out of the site;
- Review of applicable City of Milwaukie requirements, including sight distance and access standards; and
- Findings and recommendations.

Analysis Methodology

All level-of-service (LOS) analyses described in this report were performed in accordance with the procedures stated in the *Highway Capacity Manual, 6th Edition* (HCM – Reference 1) using PTV Vistro 2020 software. To ensure that the analyses were based on a reasonable worst-case scenario, peak 15-minute flow rates were used in the evaluation of all intersection levels of service. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average peak hour.

Applicable Operating Standards

Chapter 3 of the *City of Milwaukie Transportation System Plan* (TSP – Reference 2) defines the minimum acceptable measure of effectiveness for intersections during the peak hour as LOS "D" for both signalized and stop-controlled intersections.

The 1999 Oregon Highway Plan and all associated plan updates (OHP – Reference 3) defines ODOT v/c ratio mobility targets based on facility type. Per the OHP, a maximum v/c ratio of 0.99 is the ODOT mobility target for the SE 17th Avenue/OR-224 intersection. At SE 17th Avenue – SE Harrison Street/OR-99E, a maximum v/c ratio of 1.1 is the mobility target for the first highest hour and 0.99 for the second highest hour, due to its location within a Town Center.

Table 1 lists the study intersections, existing traffic control, jurisdictional authority, and the corresponding operating standard.

Table 1. Study Intersection Operating Standards

	Study Intersection	Traffic Control	Jurisdictional Authority	Intersection Operating Standard
1	SE 17th Avenue – SE Harrison Street/OR-99E	Signalized	ODOT	Intersection V/C ≤ 1.10 during the 1st Highest Hour Intersection V/C ≤ 0.99 during the 2nd Highest Hour
2	SE 17th Avenue/SE Lava Drive	Two Way Stop Control	City of Milwaukie	LOS D
3	SE 17th Avenue/OR-224	Signalized	ODOT	Intersection V/C ≤ 0.99 during the 1st and 2nd Highest Hours
4	SE Lava Drive/SE Waverly Court	Two Way Stop Control	City of Milwaukie	LOS D
5	SE Waverly Court/Proposed Site Access	Two Way Stop Control	City of Milwaukie	LOS D
6	SE Lava Drive/Potential Future Site Access	Two Way Stop Control	City of Milwaukie	LOS D

EXISTING CONDITIONS

This section summarizes the existing characteristics of the transportation system and adjacent land uses in the vicinity of the proposed development, including an inventory of the existing multimodal transportation facilities and options, an evaluation of existing intersection operations for motor vehicles at the study intersections, and a summary of recent study intersection crash history.

Site Conditions and Adjacent Land Uses

The proposed development site is located within the City of Milwaukie, northwest of the SE Lava Drive/SE Waverly Court intersection (see **Exhibit 1**). The development site is mostly forested and currently undeveloped. It is bounded by the Waverley Country Club to the northwest, and primarily residential development to the north, east and south.

Transportation Facilities

Table 2 summarizes the attributes of key roadways in the vicinity.

Table 2. Street Characteristics in Site Vicinity

Street	Classification[1]	Motor Vehicle Travel Lanes	Posted Speed (mph)	Sidewalks	Striped Bicycle Lanes	On-Street Parking
OR-224	Regional Route (Milwaukie) Urban Principal Arterial (ODOT)	4-5	50	No	No	No
SE 17th Avenue	Arterial (Milwaukie)	2	35	Partial[2]	Yes[3]	No
OR-99E	Regional Route (Milwaukie) Urban Principal Arterial (ODOT)	4-5	30	Partial[4]	Yes	No
SE Lava Drive	Local Street	2	NP[5]	Partial[6]	No	No
SE Waverly Court	Local Street	2	NP[5]	Partial[7]	No	No

[1]Per *City of Milwaukie Transportation System Plan*, Table 3-4 (Reference 2)
[2]There is a sidewalk on the west side of SE 17th Avenue between SE Lava Drive and OR-99E. North of SE Lava Drive, a multi-use path is provided on the west side of SE 17th Avenue.
[3]There is a striped bicycle lane on the east side and a multi-use path on the west side.
[4]There is a sidewalk on the east side of OR-99E between OR-224 interchange and SE 17th Avenue. North of the OR-224 interchange, pedestrian facilities are provided on SE Main Street which parallels OR-99E.
[5]Not posted.
[6]There are sidewalks on both sides of SE Lava Drive between SE 17th Avenue and SE Waverly Court, but no existing sidewalk west of SE Waverly Court.
[7]There are sidewalks on both sides of SE Waverly Court between SE lava Drive and the site frontage, but no existing sidewalk along the site frontage.

Roadway Cross Section Standards

The City of Milwaukie maintains typical cross-sections for roadways based on functional classification, as detailed in the City's *Transportation System Plan* (Reference 2). Milwaukie Municipal Code (MMC) Section 19.708 requires that all rights-of-way, streets, sidewalks, necessary public improvements, and other public transportation facilities located in the public right-of-way and abutting the development site shall be adequate at the time of development or shall be made adequate in a timely manner.

Per MMC Table 19.708.2, the SE Waverley Court and SE Lava Drive local street cross sections fronting the proposed development site should ultimately include 8-10 foot wide travel lanes, 6-8 foot wide parking, and 5-6 foot sidewalks (depending on the presence of landscape strips).

Bicycle Facilities

As summarized in Table 2, local bicycle access is facilitated by shared roadways in the immediate site vicinity (SE Waverley Court and SE Lava Drive). Bicycle lanes or multi-use path are provided along SE 17th Avenue and OR-99E. With site development, bicycle parking will be provided at one space per unit. At least half of these spaces will be covered and/or enclosed.

Pedestrian Facilities and Safe Routes to School

There are several schools located within the school district boundaries of the proposed site:

- Milwaukie Elementary School and El Puente Bilingual School, located approximately one mile southeast of the site on SE 27th Avenue
- Rowe Middle School, located approximately two miles southeast of the site on SE Lake Road
- Milwaukie High School and Milwaukie Academy of the Arts, located approximately one mile southeast of the site near downtown Milwaukie
- Clackamas Middle College and Clackamas Web Academy, located approximately five miles east of the site near Clackamas Town Center

The sidewalk network is substantially complete on surrounding arterials, collectors, and local streets connecting the site to these nearby schools. As shown in Table 2, the roadways in the site vicinity providing pedestrian access to destinations within Milwaukie have sidewalks on at least one side of the road, with the exception of OR-224 (which is not intended for multi-modal use).

With site development, sidewalks will be provided along the site frontages on SE Waverly Court (proposed) and SE Lava Drive (future). Walkways on-site will have continuous connections with adequate lighting and crossings. Walkways will be 5-7 feet wide and separated from parking with physical barriers such as planter strips and raised curbs. Additionally, a mid-block pedestrian crossing will be constructed across SE Waverly Court. Sidewalk connection along the north side of SE Lava Drive to existing pedestrian facilities at SE Waverly Court will also be provided upon build-out of the potential future development phase on SE Lava Drive. Pedestrian connections are shown in the site plan in **Attachment A.**

Transit Facilities

Per TriMet's online schedule, (Reference 4) weekday bus service is provided by TriMet Route 70 (12th/NE33rd Ave) along SE 17th Avenue between downtown Milwaukie and the Sunderland neighborhood (NE Portland) from 7:30 AM to 11:00 PM. Headways change throughout the day and range from approximately 20 to 30 minutes. The stop closest to the site is on SE 17th Avenue at SE Lava Drive, approximately ¼-mile from the site.

Approximately ½-mile from the site in downtown Milwaukie, TriMet Routes 29, 30, 32, 33, 34, 75, 99, and 152 converge, offering connection to various destinations. Additionally, the Milwaukie/Main Street MAX Station (orange line connecting Milwaukie to downtown Portland) stops approximately ¾-mile from the site.

Crash History Analysis

Reported crash history for each study intersection was reviewed in an effort to identify potential intersection safety issues. Reported crash data for the study intersections were obtained from ODOT for the five-year period from January 1, 2013 through December 31, 2017. **Table 3** summarizes the crashes reported at the study intersections. **Attachment B** contains the ODOT crash data. No crashes were reported at SE Lava Drive/SE Waverly Court (Intersection #4).

Table 3. Intersection Crash History (January 1, 2013 through December 31, 2017)

Intersection		Collision Type					Severity			Total Crashes
		Rear End	Turning	Angle	Bike/Ped	Other	PDO[1]	Injury	Fatal	
1	SE 17th Avenue – SE Harrison Street/OR-99E	14	6	4	1	1	10	16	0	26
2	SE 17th Avenue/SE Lava Drive	0	0	0	0	2	1	1	0	2
3	SE 17th Avenue/OR-224	6	1	0	1	1	4	5	0	9

[1]PDO – Property damage only

ODOT provides an annual list of safety priority index system (SPIS) locations which are based on reported crash data. The intent of the SPIS list is to identify roadway segments exhibiting an unusually high occurrence of crashes and is used to select locations for investigation. Review of the SPIS list determined that the north leg of OR-99E at SE 17th Avenue – SE Harrison Street is within the top ten percent.

Critical crash rates were calculated for each of the study intersections following the analysis methodology presented in ODOT's *SPR 667 Assessment of Statewide Intersection Safety Performance* (Reference 5). SPR 667 provided average crash rates at a variety of intersection configurations in Oregon based on number of approaches and traffic control types. The average crash rate represents the approximate number of crashes that are "expected" at a study intersection. Additionally, this

average crash rate was used to calculate the critical crash rate for each study intersection, based on the *Highway Safety Manual* methodology (Reference 6). The critical crash rate is calculated for each intersection based on the average crash rate for each facility and serves as a threshold for further analysis.

Table 4 summarizes the critical crash rate for each intersection and compares those values to the observed crash rate. Per ODOT, if the observed crash rate at the study location exceeds the critical rate, it is a possible indication that the location is exceeding average crash rates. As shown in **Table 4**, the observed crash rate at all intersections is less than the critical crash rates.

Table 4. Intersection Crash Rate Assessment

	Location	Total Crashes	Critical Crash Rate by Intersection	Critical Crash Rate by Volume	Observed Crash Rate at Intersection	Observed Crash Rate>Critical Crash Rate?
1	SE 17th Avenue – SE Harrison Street/OR-99E	26	0.62	0.53	0.36	No
2	SE 17th Avenue/SE Lava Drive	2	0.29	0.40	0.11	No
3	SE 17th Avenue/OR-224	9	0.69	0.45	0.27	No

No safety-based mitigations were identified for implementation in conjunction with the proposed development based on review of the historic crash data alone.

Existing Conditions Operational Analysis

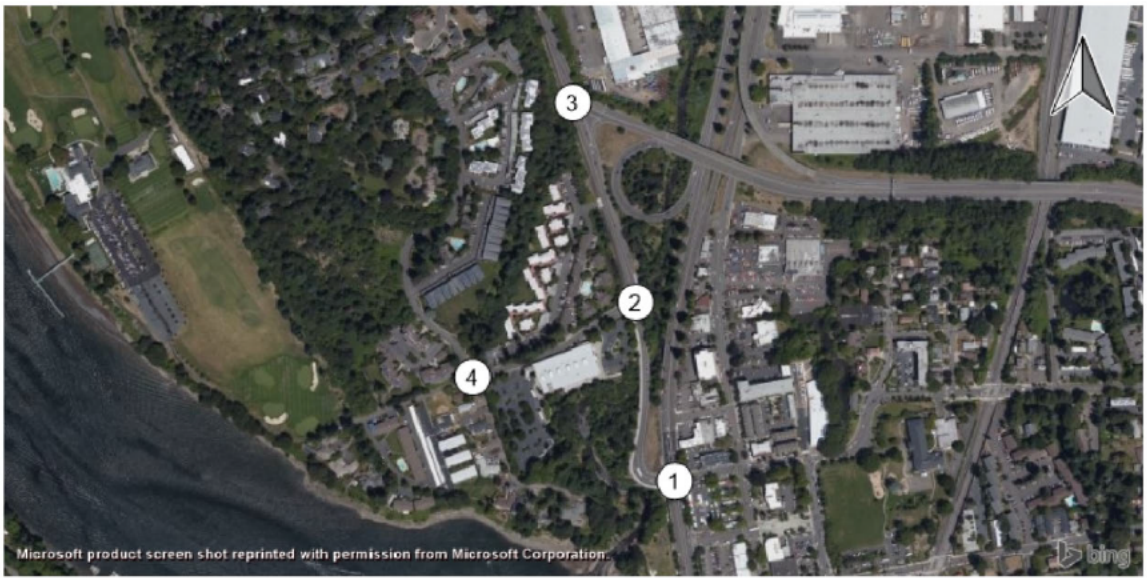
Given the impacted traffic pattens due to the current COVID-19 pandemic and State of Oregon stay at home order, new traffic counts were not collected for this analysis. Rather, historical morning (7:00-9:00 AM) and evening (4:00-6:00 PM) peak hour traffic count data was collected from June of 2014 at study Intersections #1-3. These counts are included in **Attachment C**.

A 2.7% linear annual growth rate was applied to the 2014 traffic counts to estimate year 2020 existing traffic volumes. This rate was calculated based on the average growth of ODOT Transportation Volume Tables (TVT) from 2014 to 2018 near the McLoughlin Blvd (OR-99E)/17th Ave/ Harrison St intersection. This growth rate is reflective of growth throughout a typical day. However, a comparison of more recent signal detector count data provided by ODOT at Intersections #1 and #3 between 2018 and 2020 indicates a reduction in PM peak hour traffic volumes. To account for this reduction, a zero growth was applied to the PM peak hour traffic volumes for all years *after* year 2018, which is conservative given recent negative growth trend. These calculations are included in **Attachment C.**

Trips from SE 17th Avenue/SE Lava Drive (Intersection #3) were distributed along the SE Lava Drive corridor according to an estimation of trips associated with each existing land use according to trip rates presented in *Trip Generation Manual, 10th Edition* (Reference 7). This analysis was used to estimate existing turning movements at Intersection #4, where historical traffic count data is not available.

Exhibit 2 shows existing lane configurations, traffic control devices, and existing traffic volumes at the study intersections.

Exhibit 2. Existing Lane Configurations, Traffic Control Devices, and Traffic Volumes



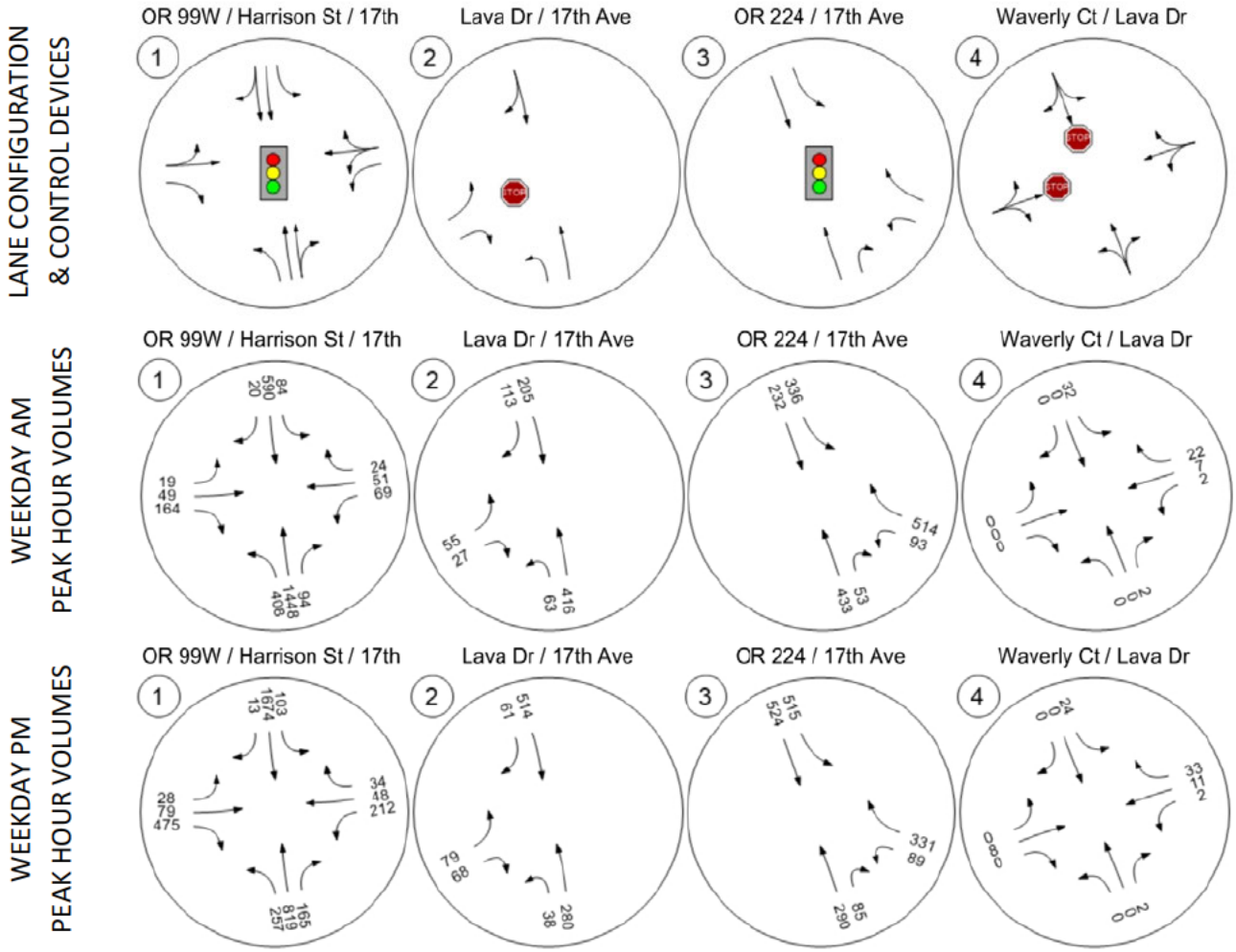


Table 5 summarizes the estimated 2020 existing traffic conditions for the weekday AM and PM peak hours.

Table 5. Estimated 2020 Existing Traffic Conditions

Study Intersection		Operating Requirement	Weekday AM Peak Hour		Weekday PM Peak Hour	
			V/C	LOS	V/C	LOS
1	SE 17th Avenue – SE Harrison Street/OR-99E	Intersection V/C ≤ 1.10 during the 1st Highest Hour Intersection V/C ≤ 0.99 during the 2nd Highest Hour	0.68	C	0.94	D
2	SE 17th Avenue/SE Lava Drive	LOS D	0.21 (EBL)	C	0.31 (EBL)	C
3	SE 17th Avenue/OR-224	Intersection V/C ≤ 0.99 during the 1st and 2nd Highest Hours	0.75	C	0.67	B
4	SE Waverly Court/ SE Lava Drive	LOS D	0.04 (SB)	A	0.03 (SB)	A

WB= Westbound, SB = Southbound, EB = Eastbound, NB = Northbound, L = Left, T = Through, R = Right
V/C= Intersection volume-to-capacity ratio (signalized) / Critical lane group volume-to-capacity ratio (unsignalized)
LOS= Intersection level of service (signalized) / Critical lane group level of service (unsignalized)

As shown in **Table 5**, all of the intersections satisfy applicable City and ODOT standards under existing traffic conditions. **Attachment D** includes the 2020 existing traffic operations analysis worksheets.

TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis identifies how the study area's transportation system would operate in the year 2021 with and without development of the site. This section of the report includes analysis of 2021 background traffic volumes and operations, an estimate of site-generated trips, and analysis of 2021 total traffic volumes and operations with the proposed development.

2021 Background Operational Analysis

Background traffic volumes include changes in volumes due to added trips from in-process developments in the vicinity of the site as well as general regional growth. Per direction from City of Milwaukie staff, no in-process developments or planned transportation improvements are included in the background traffic analysis for this development. Similar to the methodology for estimating existing traffic volumes, a 2.7% growth rate was applied to 2020 traffic volumes in the AM peak hour to estimate 2021 build-out year background traffic volumes. Zero growth was applied to the 2020 traffic volumes in the PM peak hour. **Exhibit 3** shows the year 2021 background traffic volumes at the study intersections.

Exhibit 3. Year 2021 Background Traffic Volumes

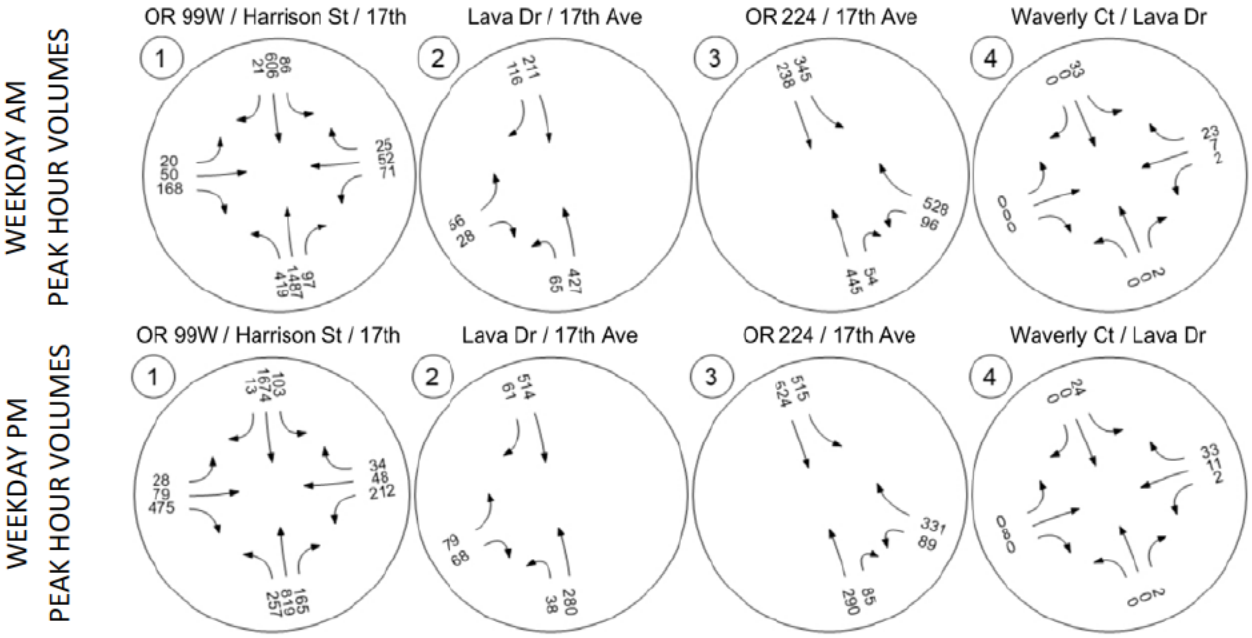


Table 6 summarizes the 2021 build-out year background traffic conditions for the weekday AM and PM peak hours. As shown in **Table 6**, all of the intersections are expected to continue to satisfy applicable City and ODOT standards under 2021 build-out year background traffic conditions. **Attachment E** includes the 2021 background traffic operations analysis worksheets.

Table 6. Year 2021 Background Traffic Conditions

Study Intersection		Operating Requirement	Weekday AM Peak Hour		Weekday PM Peak Hour	
			V/C	LOS	V/C	LOS
1	SE 17th Avenue – SE Harrison Street/OR-99E	Intersection V/C ≤ 1.10 during the 1st Highest Hour Intersection V/C ≤ 0.99 during the 2nd Highest Hour	0.70	C	0.94	D
2	SE 17th Avenue/SE Lava Drive	LOS D	0.22 (EBL)	C	0.31 (EBL)	C
3	SE 17th Avenue/OR-224	Intersection V/C ≤ 0.99 during the 1st and 2nd Highest Hours	0.76	C	0.67	B
4	SE Waverly Court/ SE Lava Drive	LOS D	0.04 (SB)	A	0.03 (SB)	A

WB= Westbound, SB = Southbound, EB = Eastbound, NB = Northbound, L = Left, T = Through, R = Right
V/C= Intersection volume-to-capacity ratio (signalized) / Critical lane group volume-to-capacity ratio (unsignalized)
LOS= Intersection level of service (signalized) / Critical lane group level of service (unsignalized)

Trip Generation Estimate

Trips for the proposed development were estimated using trip rates obtained from *Trip Generation Manual, 10th Edition* (Reference 7), as shown in **Table 7**.

Table 7. Trip Generation

Land Use	ITE Code	Size	Total Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total Trips	In	Out	Total Trips	In	Out
Multifamily Housing (Mid-Rise)	221	132 units	359	45	12	33	58	35	23

Trip Distribution/Assignment

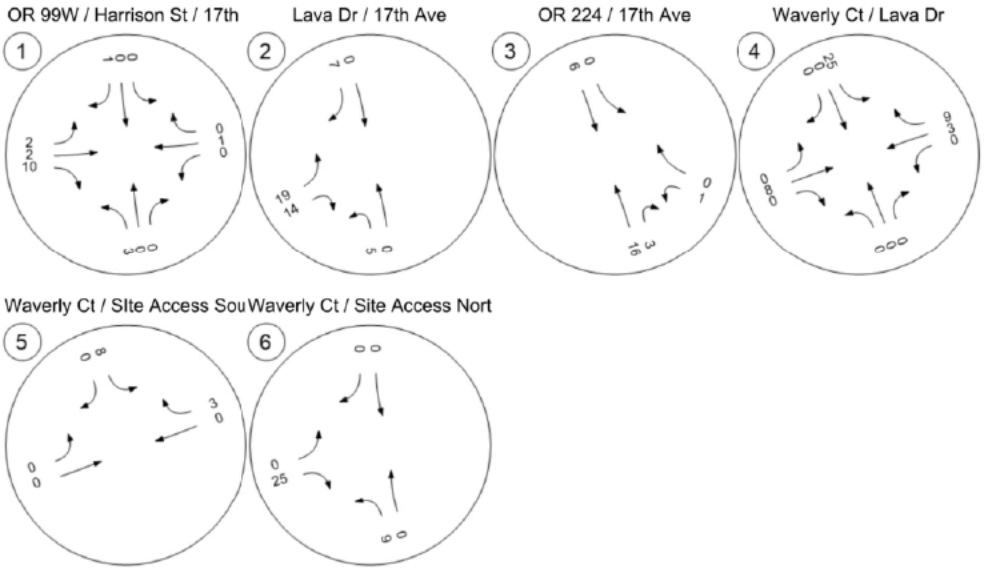
A trip distribution pattern was identified for the site considering existing traffic patterns at the study intersections. Site-generated traffic was assigned to the study intersections based on the estimated distribution pattern. **Exhibit 4** shows the proposed trip distribution and the site-generated trip assignment at each study intersection for the weekday AM and PM peak hours.

Year 2021 Total Traffic Conditions

The total traffic conditions analysis forecasts the operation of the study area's transportation system with the inclusion of traffic generated by the proposed site development. Total traffic conditions were determined by adding the estimated site-generated trips to the year 2021 background volumes for the weekday AM and PM peak hours. **Exhibit 5** shows the year 2021 total traffic volumes at the study intersections.

Exhibit 4. Site Generated Trip Distribution Pattern and Site Trip Assignments

WEEKDAY AM PEAK HOUR TRIP ASSIGNMENT



WEEKDAY PM PEAK HOUR TRIP ASSIGNMENT

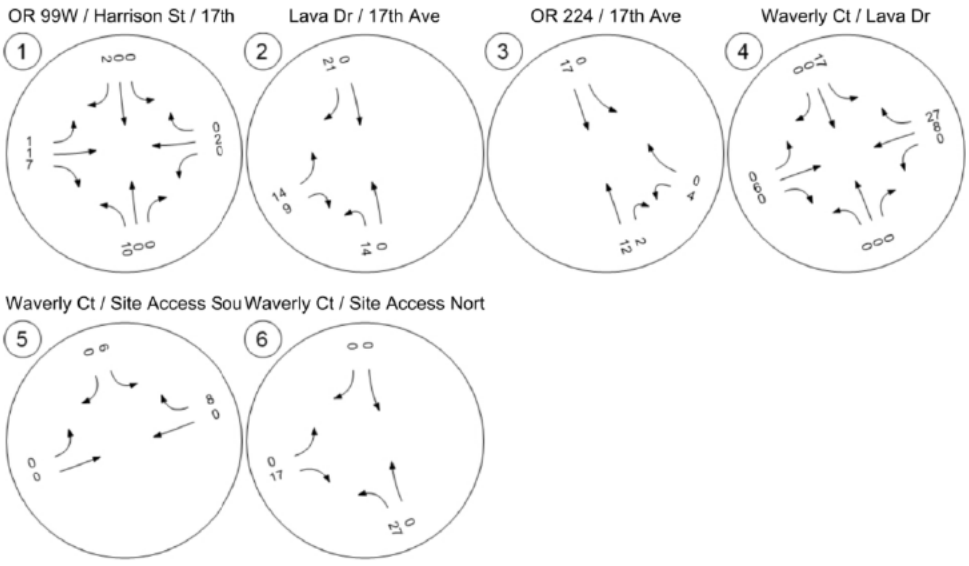
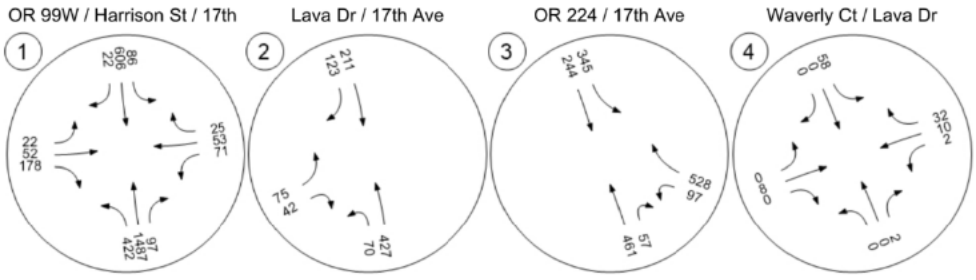
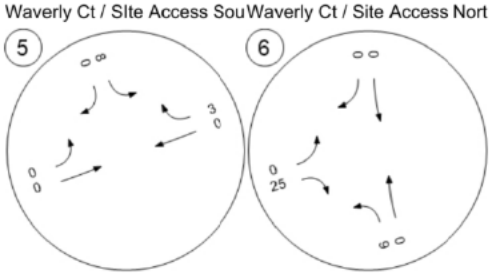


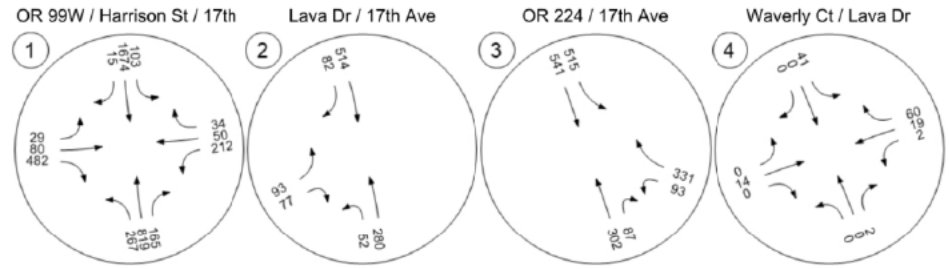
Exhibit 5. Lane Configuration, Traffic Control Devices, and Year 2021 Total Traffic Volumes

WEEKDAY AM PEAK HOUR VOLUMES





WEEKDAY PM PEAK HOUR VOLUMES



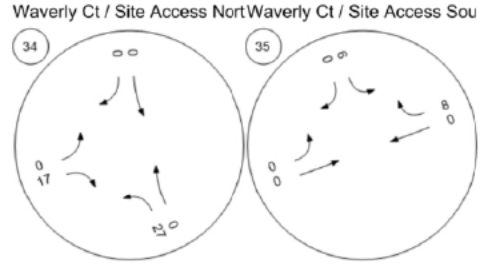


Table 8 summarizes the 2021 total traffic conditions and corresponding operational analysis for the weekday AM and PM peak hours.

Table 8. Year 2021 Total Traffic Conditions

Study Intersection		Operating Requirement	Weekday AM Peak Hour		Weekday PM Peak Hour	
			V/C	LOS	V/C	LOS
1	SE 17th Avenue – SE Harrison Street/OR-99E	Intersection V/C ≤ 1.10 during the 1st Highest Hour Intersection V/C ≤ 0.99 during the 2nd Highest Hour	0.70	D	0.95	D
2	SE 17th Avenue/SE Lava Drive	LOS D	0.31 (EBL)	C	0.40 (EBL)	D
3	SE 17th Avenue/OR-224	Intersection V/C ≤ 0.99 during the 1st and 2nd Highest Hours	0.77	C	0.67	B
4	SE Lava Drive/SE Waverly Court	LOS D	0.07 (SB)	A	0.05 (SB)	A
5	SE Waverly Court/Proposed Site Access	LOS D	0.02 (EB)	A	0.02 (EB)	A
6	SE Lava Drive/Potential Future Site Access	LOS D	0.01 (SB)	A	0.01 (SB)	A

WB= Westbound, SB = Southbound, EB = Eastbound, NB = Northbound, L = Left, T = Through, R = Right
V/C= Intersection volume-to-capacity ratio (signalized) / Critical lane group volume-to-capacity ratio (unsignalized)
LOS= Intersection level of service (signalized) / Critical lane group level of service (unsignalized)

As shown in **Table 8**, all of the intersections are expected to continue to satisfy applicable City and ODOT standards under 2021 total traffic conditions. **Attachment F** includes the 2021 total traffic operations analysis worksheets.

Year 2021 Queuing Analysis

95th percentile static queues reported by Vistro at each study intersection were assessed during the weekday AM and PM peak hours under 2021 total traffic conditions. The results are summarized in **Table 9**.

As shown in **Table 9**, all 95th percentile queues during year 2021 total traffic conditions would be accommodated by the available storage, with the exception of the northbound left-turn (AM peak) and westbound left-turn (PM peak) at SE 17th Avenue – SE Harrison Street/OR-99E. However, queues under 2021 total traffic conditions for these two movements are within 10 feet of background traffic conditions. This indicates that less than a single vehicle length is added to the queues with site development. Furthermore, both of these turn lanes extend to the next intersection. Therefore, lengthening is not appropriate as a condition of site development.

Table 9. Summary of 95th Percentile Queues, 2021 Total Traffic Conditions

Intersection		Movement	Available Queue Storage (feet)	95th Percentile Queue (feet)		Queue Storage Adequate?
				Weekday AM Peak Hour	Weekday PM Peak Hour	
1	SE 17th Avenue – SE Harrison Street/OR-99E	NBL	375	600	375	**No**
		NBTR	Continuous	600	350	Yes
		SBL	375	150	150	Yes
		SBTR	Continuous	300	900	Yes
		EBR	150	100	150	Yes
		EBTL	Continuous	75	250	Yes
		WBL	135	100	225	**No**
		WBLTR	Continuous	150	225	Yes
2	SE 17th Avenue/SE Lava Drive	WBL	150	50	50	Yes
		WBR	65	25	25	Yes
3	SE 17th Avenue/OR-224	NBT	Continuous	550	250	Yes
		NBR	135	75	75	Yes
		SBL	300[1]	225	250	Yes
		SBT	Continuous	150	250	Yes
		WBL	150	150	75	Yes
		WBR	Continuous	325	75	Yes
4	SE Lava Drive/SE Waverly Court	NBLTR	120	0	0	Yes
		SBLTR	140	25	25	Yes
5	SE Waverly Court/Proposed Site Access	EBLTR	75	25	25	Yes
6	SE Lava Drive/Potential Future Site Access	SBLTR	75	25	25	Yes

Where: EB = eastbound, WB = westbound, NB = northbound, SB = southbound, L = left-turn, T= through, R = right-turn
Queues rounded up to the nearest vehicle length, assumed to be 25 feet
[1]Approximately 160 feet of storage is provided, however, the turn lane approach includes a striped center median allowing for approximately 140 feet of additional storage.

Intersection Sight Distance

The sight distance analysis documented herein for the proposed site driveways on SE Waverly Court and SE Lava Drive was conducted per the guidelines provided in the most recent edition of American Association of State Highway Transportation Officials' (AASHTO) A Policy on Geometric Design of Highways and Streets. Specifically, Sections 6 (Stopping Sight Distance, SSD) and 9 (Intersection Sight Distance, ISD) of AASHTO were applied.

Consistent with AASHTO guidelines, ISD measurements were taken in the field from the location of the proposed accesses from a viewpoint 15 feet behind the edge of the traveled way and from a height of 3.5 feet above the ground, looking toward an object that is 3.5 feet above the ground along the travel way. SSD measurements were obtained in the field from the approaching travel way from a viewpoint 3.5 feet above the ground looking toward an object that is 2 feet above the ground.

Based on field observations, sight distance measurements are documented at each of the two site access locations in **Table 10** and supporting photos are included in **Attachment G.**

Table 10: Proposed Site Driveway Observed Sight Distances

Site Driveway	Roadway Speed Limit	AASHTO Requirements			Observed Sight Distance	Satisfies AASHTO Requirements? (ISD/SSD)
		ISD[1]: Right Turn from Stop	ISD: Left turn from Stop	SSD[2]		
Proposed SE Waverly Court Site Access	25 MPH	240 feet	280 feet	155 feet	~200 feet southbound ~200 feet northbound	No/Yes
Potential Future SE Lava Drive Site Access	25 MPH	240 feet	280 feet	155 feet	~130 feet westbound >240 feet eastbound	Yes/Yes[3] Yes/Yes

[1] ISD: Intersection Sight Distance
[2] SSD: Stopping Sight Distance
[3] SE Lava Drive is a dead-end road approximately 130 feet west of the proposed SE Lava Drive access.

SE Waverly Court Access

The proposed site access on SE Waverly Court will provide full turning movements. As summarized in **Table 10**, sight distance was observed at approximately 200 feet in both the northbound and southbound directions. The ISD for traffic looking north and south along SE Waverly Court are limited by landscaping to the north, and the combined effects of horizontal and vertical curvature to the south. Although ISD requirements are not met, sight distance observations exceed the required 155-foot SSD. Photographs taken facing north and south of the proposed access location are shown in **Attachment G**.

According to the AASHTO guidelines, "if the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions."

Any new landscaping, above ground utilities, and signing should be located and maintained along the site frontage to maximize sight distance.

The possibility of aligning the proposed site access on SE Waverly Court with the existing Waverley Greens driveway was explored. However, due to the significant upward grade on the site at this location, it was determined that it would be unsafe to align the driveways.

SE Lava Drive Access

The potential future site access on SE Lava Drive will provide full turning movements. As summarized in **Table 10**, sight distance was observed in excess of the required 240 feet to the east for ISD (with the removal of some existing bushes/shrubs). SE Lava Drive ends at a gated private access approximately 130 feet west of the future access. With the removal of some existing bushes/shrubs, drivers

approaching SE Lava Drive at the site access are able to see the existing gate. Therefore, the south site access can provide sufficient sight distance. Photographs taken facing east and west of the future access location are shown in **Attachment G**.

Any new landscaping, above ground utilities, and signing should be located and maintained along the site frontage to maximize sight distance.

Analysis of Access Standards

Per Section 12.16.040 of the *City of Milwaukie Municipal Code* (Reference 8) driveway access to the nearest intersecting street face shall be a minimum of 100 feet. Both driveway access locations are at least 100 feet from the nearest intersection of SE Waverley Court and SE Lava Drive.

Parking Supply Analysis

The Applicant proposes a total of 193 parking spaces upon full site build-out. A minimum of 165 parking spaces (1.25 spaces per unit for units over 800 square feet) are required, and maximum of 264 (2 spaces per unit) are allowed per City Code Table 19.605.1 (Reference 8).

FINDINGS AND RECOMMENDATIONS

Based on the results of the transportation impact analysis, the proposed development can be constructed while maintaining acceptable operations at the study intersections. The analysis developed the following findings and recommendations.

Findings

- All study intersections are forecast to operate within the applicable review agency volume-to-capacity ratio and delay standards under existing and site build-out year 2021 conditions during the weekday AM and PM peak hours.
- Historical crash data for the study area intersections indicate no patterns or trends that require mitigation associated with the proposed development.

RECOMMENDATIONS

- Any new landscaping, above ground utilities, and signing should be located and maintained along the site frontage to maximize sight distance.

Please contact us if you need any additional information regarding our analyses.

REFERENCES

1. Transportation Research Board. *Highway Capacity Manual 6th Edition*. 2016.
2. *City of Milwaukie Transportation System Plan*. Revised October 2018.
3. Oregon Department of Transportation. *1999 Oregon Highway Plan.* Amended May 2015.
4. TriMet. "Bus Services." Accessed on-line at www.trimet.org. Accessed July 2020.
5. Oregon Department of Transportation Research Section. *SPR 667 Assessment of Statewide Intersection Safety Performance*. June 2011.
6. American Association of State Highway and Transportation Officials. *Highway Safety Manual*. 2010.
7. Institute of Transportation Engineers. *Trip Generation, 10th Edition.* 2017.
8. *City of Milwaukie Municipal Code*. Revised February 2020. Accessed July 2020.

ATTACHMENTS

Attachment A – Site Plan

Attachment B – Crash Data

Attachment C – Traffic Count Data

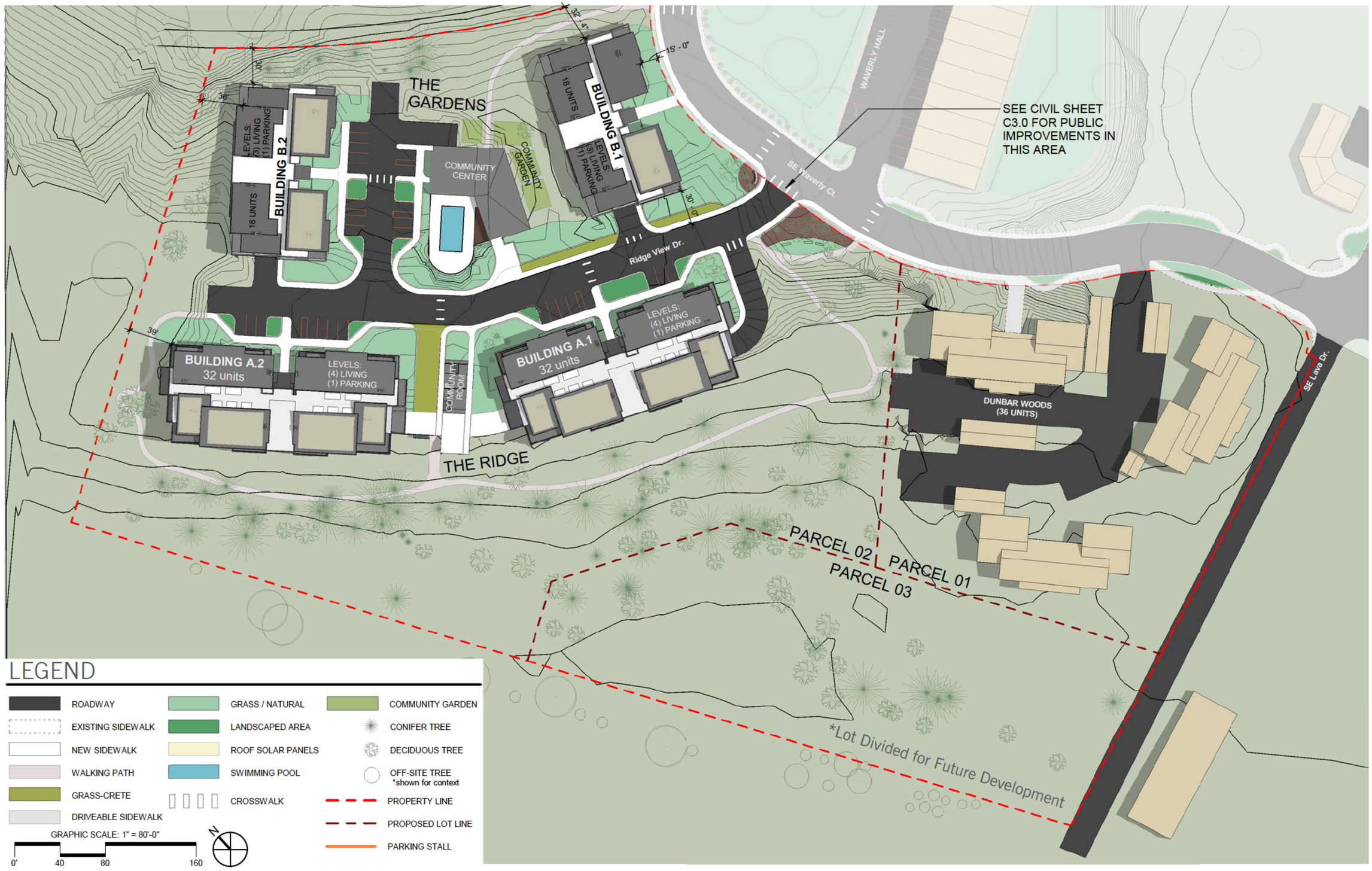
Attachment D – Existing Traffic Level-of-Service Worksheets

Attachment E – 2021 Background Traffic Level-of-Service Worksheets

Attachment F – 2021 Total Traffic Level-of-Service Worksheets

Attachment G – Sight Distance Observations

Attachment A – Site Plan



LEGEND

- ROADWAY
- EXISTING SIDEWALK
- NEW SIDEWALK
- WALKING PATH
- GRASS-CRETE
- DRIVEABLE SIDEWALK
- GRASS / NATURAL
- LANDSCAPED AREA
- ROOF SOLAR PANELS
- SWIMMING POOL
- CROSSWALK
- COMMUNITY GARDEN
- CONIFER TREE
- DECIDUOUS TREE
- OFF-SITE TREE *shown for context
- PROPERTY LINE
- PROPOSED LOT LINE
- PARKING STALL

GRAPHIC SCALE: 1" = 80'-0"

0' 40 80 160

42°

A1.0 - SITE PLAN

09/10/2020

Attachment B – Crash Data

OREGON DEPARTMENT OF TRANSPORTATION - POLICY, DATA AND ANALYSIS DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

171 CLACKAMAS

Intersectional Crashes at OR-224, Clackamas Hwy (#171) & SE 17th Ave
January 1, 2013 through December 31, 2017

SER# / INVEST / UNLOC?	SPEED	ALC	DRUG	MJ	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC	CONN # FIRST STREET SECOND STREET INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD RNDBT DRVWY	WTHR	SURF	LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00655	N	N	N				02/25/2013	CLACKAMAS	2	12		INTER	3-LEG	N		N	RAIN	S-1STOP	01	NONE 0	STRGHT												07
NONE		N					Mon 8A	MILWAUKIE	MN 0		CLACKAMAS HY	E		L-GRN-SIG		N	WET	REAR		PRVTE	E W									000		00
								PORTLAND UA	- 0.01		17TH AVE	06	1			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		07
No	*45*	*26*	*59.69*	*-122*	*38*	*40.20*			017100200S00		1																	OR<25					
																				02	NONE 1	STOP										
																					PRVTE	E W									012		00
																					SEMI TOW		01	DRVR	NONE	35	F	OR-Y		000	000		00
																												OR<25					
02593	N	N	N				07/19/2013	CLACKAMAS	1	12		INTER	3-LEG	N		N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE		N					Fri 7P	MILWAUKIE	MN 0		CLACKAMAS HY	E		TRF SIGNAL		N	DRY	REAR		PRVTE	E W									000		00
								PORTLAND UA	- 0.01		17TH AVE	06	1			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		07
No	*45*	*26*	*59.23*	*-122*	*38*	*39.95*			017100100S00		1																	OR<25					
																				02	NONE 0	STOP										
																					PRVTE	E W									012		00
																					PSNGR CAR		01	DRVR	INJC	70	F	OR-Y		000	000		00
																												OR<25					
00629	N	N	N	N	N		02/16/2017	CLACKAMAS	2	12		INTER	3-LEG	N		N	RAIN	S-1STOP	01	NONE 0	STRGHT												29,27
CITY		N					Thu 8A	MILWAUKIE	MN 0		CLACKAMAS HY	E		TRF SIGNAL		N	WET	REAR		PRVTE	E W									000		00
								PORTLAND UA	- 0.01		17TH AVE	06	1			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000		29,27
No	*45*	*26*	*59.69*	*-122*	*38*	*40.20*			017100200S00		1																	UNK					
																				02	NONE 0	STOP										
																					PRVTE	E W									011		00
																					PSNGR CAR		01	DRVR	INJC	39	F	OR-Y		000	000		00
																												OR<25					
02319	N	N	N				06/29/2013	CLACKAMAS	1	12		INTER	3-LEG	N		N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE		N					Sat 12P	MILWAUKIE	MN 0		CLACKAMAS HY	SE		STOP SIGN		N	DRY	REAR		UNKN	SW NE									000		00
								PORTLAND UA	- 0.01		17TH AVE	09	1			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		07
No	*45*	*26*	*59.23*	*-122*	*38*	*39.95*			017100100S00		1																	UNK					
																				02	NONE 0	STOP										
																					PRVTE	SW NE									011		00
																					PSNGR CAR		01	DRVR	INJC	37	F	OR-Y		000	000		00
																												OR<25					
02780	N	N	N	N	Y		06/14/2016	CLACKAMAS	2	12		INTER	3-LEG	N		Y	CLD	FIX OBJ	01	NONE 9	TURN-L											079	27,08
CITY		N					Tue 11P	MILWAUKIE	MN 0		CLACKAMAS HY	W		TRF SIGNAL		N	WET	FIX		N/A	E S									000		00
								PORTLAND UA	- 0.01		17TH AVE	05	1			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
No	*45*	*26*	*59.69*	*-122*	*38*	*40.20*			017100200S00		1																	UNK					

171 CLACKAMAS

Intersectional Crashes at OR-224, Clackamas Hwy (#171) & SE 17th Ave
January 1, 2013 through December 31, 2017

SER# / INVEST / UNLOC?	SPED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	CONN #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00109	N	N	N	N	N	01/10/2015	CLACKAMAS	2 12			INTER	3-LEG	N	N	CLD	BIKE													110	04
CITY		N				Sat 4P	MILWAUKIE	MN 0	CLACKAMAS HY		CN		TRF SIGNAL	N	WET	TURN														
							PORTLAND UA	- 0.01	17TH AVE		02	1		N	DAY	INJ			STRGHT	01	BIKE	INJB	45	F		02	020	035		04
No	*45 26*		*59.69*	*-122 38*	*40.20*			017100200	S00	1									S N										
																	01	NONE 0	TURN-R										
																		PRVTE	E N									000	00
																		PSNGR CAR		01	DRVR	NONE	78	M	OR-Y		000	000	00
																									OR<25				
00494	N	N	N	N	N	02/06/2014	CLACKAMAS	1 12			INTER	3-LEG	N	N	SNOW	S-1STOP	01	NONE 0	STRGHT											07
CITY		N				Thu 2P	MILWAUKIE	MN 0	CLACKAMAS HY		CN		TRF SIGNAL	N	ICE	REAR		PRVTE	N S									000	00
							PORTLAND UA	- 0.01	17TH AVE		03	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		026	000		07
No	*45 26*		*59.23*	*-122 38*	*39.95*			017100100	S00	1															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N S									011	00
																		PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		000	000	00
																									OR<25				
01712	N	N	N	N	N	05/07/2015	CLACKAMAS	1 12			INTER	3-LEG	N	N	CLR	S-OTHER	01	NONE 0	TURN-L											08
CITY		N				Thu 3P	MILWAUKIE	MN 0	CLACKAMAS HY		CN		L-GRN-SIG	N	DRY	TURN		PRVTE	N E									000	00
							PORTLAND UA	- 0.01	17TH AVE		03	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	39	M	OR-Y		005	000		08
No	*45 26*		*59.23*	*-122 38*	*39.95*			017100100	S00	1															OR<25				
																	02	NONE 0	TURN-L										
																		PRVTE	N E									000	00
																		PSNGR CAR		01	DRVR	NONE	61	F	OR-Y		000	000	00
																									OR<25				

OREGON DEPARTMENT OF TRANSPORTATION - POLICY, DATA AND ANALYSIS DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

Intersectional Crashes at OR-224, Clackamas Hwy (#171) & SE 17th Ave
January 1, 2013 through December 31, 2017

SER# / INVEST / UNLOC?	SPED	ALC	DRUG/MJ	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
81588	N	N	N			09/21/2015	16	CLACKAMAS HY	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT			N			Mon 4P	0	17TH AVE	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000		00
No	*45 26 59.69*					*-122 38 40.20*	1	1	06	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	34	F	OTH-Y N-RES		026	000		29
															02	NONE 0	STOP											
																PRVTE	N S									011		00
																PSNGR CAR		01	DRVR	INJC	39	M	OR-Y OR<25		000	000		00
																		02	PSNG	INJC	72	F			000	000		00
																		03	PSNG	INJC	49	F			000	000		00

081 PACIFIC HIGHWAY EAST — Intersectional Crashes at OR-99E, Pacific Hwy (#081), McLoughlin Blvd & SE 17th Ave / SE Harrison St
January 1, 2013 through December 31, 2017

SER# / INVEST / UNLOC?	S P E D	E L C	A M J	D R U G	S H L	W O R K	DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
04400	N	N	N				11/14/2013	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE		N					Thu 4P	MILWAUKIE	MN 0	MCLOUGHLIN BLVD	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000	00
								PORTLAND UA	5.72	17TH AVE	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	F	OTH-Y		026	000	07
No							*45 26 43.37 -122 38 33.97*		008100100S00	1															N-RES				
																	02	NONE 0	STOP										
																		PRVTE	N S									011	00
																		PSNGR CAR		01	DRVR	INJC	38	F	OR-Y		000	000	00
																									OR<25				
00440	N	N	N	N	N	N	02/04/2015	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										35,13
CITY		N					Wed 3P	MILWAUKIE	MN 0	HARRISON ST	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000	00
								PORTLAND UA	5.72	MCLOUGHLIN BLVD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	43	M	OR-Y		045	000	13
No							*45 26 43.37 -122 38 33.97*		008100100S00	1															OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	N S									000	00
																		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y		045	000	13
																									OR<25				
05280	N	Y	N				12/10/2015	CLACKAMAS	1 14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										29,07
CITY		N					Thu 2A	MILWAUKIE	MN 0	HARRISON ST	N		L-GRN-SIG	N	WET	REAR		PRVTE	N S									000	00
								PORTLAND UA	5.72	MCLOUGHLIN BLVD	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	23	M	OR-Y		043,026	000	29,07
No							*45 26 43.37 -122 38 33.97*		008100100S00	1															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N S									012	00
																		PSNGR CAR		01	DRVR	NONE	51	M	OR-Y		000	000	00
																									OR<25				
84208	N	N	N				06/25/2016	CLACKAMAS	2 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE		N					Sat 9A	MILWAUKIE	MN 0	HARRISON ST	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000	00
								PORTLAND UA	5.72	MCLOUGHLIN BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	49	M	OTH-Y		026	000	29
No							*45 26 43.37 -122 38 33.97*		008100200S00	1															N-RES				
																	02	NONE 0	STOP										
																		PRVTE	N S									011	00
																		PSNGR CAR		01	DRVR	INJC	43	M	OR-Y		000	000	00
																									OR<25				
00401	N	N	N	N	N	N	01/30/2017	CLACKAMAS	1 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										29
CITY		N					Mon 1P	MILWAUKIE	MN 0	HARRISON ST	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000	00
								PORTLAND UA	5.72	MCLOUGHLIN BLVD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	39	M	OR-Y		026	000	29
No							*45 26 43.37 -122 38 33.97*		008100100S00	1															OR<25				

081 PACIFIC HIGHWAY EAST — Intersectional Crashes at OR-99E, Pacific Hwy (#081), McLoughlin Blvd & SE 17th Ave / SE Harrison St
January 1, 2013 through December 31, 2017

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / LRS	FC / MILEPNT	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																	02	NONE / 0 / PRVTE	STOP / N / S						OR-Y			011		00
																		PSNGR CAR		01	DRVR	INJC	63	M	OR-Y / OR<25		000	000		00
02997	N	N	N			07/24/2017 Mon 5P	CLACKAMAS / MILWAUKIE / PORTLAND UA	2 / MN / 5.72	14 / 0	HARRISON ST / MCLOUGHLIN BLVD	INTER / N / 06	CROSS / 0	N / TRF SIGNAL /	N	CLR / DRY / DAY	S-1STOP / REAR / INJ	01	NONE / 0 / UNKN	STRGHT / N / S											29
NONE		N									S				N													000		00
No						*45 26 43.37 -122 38 33.97*		008100200S00		1								PSNGR CAR		01	DRVR	NONE	38	F	OR-Y / UNK		026	000		29
																	02	NONE / 0 / PRVTE	STOP / N / S						OR-Y			011		00
																		PSNGR CAR		01	DRVR	INJC	47	M	OR-Y / OR<25		000	000		00
05142	N	N	N	N	N	11/06/2016 Sun 9P	CLACKAMAS / MILWAUKIE / PORTLAND UA	2 / MN / 5.72	14 / 0	MCLOUGHLIN BLVD / 17TH AVE	INTER / S / 05	CROSS / 0	N / TRF SIGNAL /	N	CLD / WET / DLIT	S-OTHER / TURN / PDO	01	NONE / 9 / N/A	TURN-R / W / S											27,08
CITY		N									S				N													000		00
No						*45 26 43.37 -122 38 33.97*		008100200S00		1								PSNGR CAR		01	DRVR	NONE	00	U	UNK / UNK		000	000		00
																	02	NONE / 9 / N/A	TURN-R / W / S						UNK			000		00
																		PSNGR CAR		01	DRVR	NONE	00	U	UNK / UNK		000	000		00
03035	N	N	N			07/26/2017 Wed 3P	CLACKAMAS / MILWAUKIE / PORTLAND UA	2 / MN / 5.72	14 / 0	HARRISON ST / MCLOUGHLIN BLVD	INTER / S / 05	CROSS / 0	N / TRF SIGNAL /	N	CLR / DRY / DAY	S-OTHER / TURN / PDO	01	NONE / 9 / N/A	TURN-L / E / S											08,14
NONE		N									S				N													000		00
No						*45 26 43.37 -122 38 33.97*		008100200S00		1								PSNGR CAR		01	DRVR	NONE	00	U	UNK / UNK		000	000		00
																	02	NONE / 9 / N/A	TURN-L / E / S						UNK			000		00
																		PSNGR CAR		01	DRVR	NONE	00	U	UNK / UNK		000	000		00
05466	N	N	N			12/21/2017 Thu 6P	CLACKAMAS / MILWAUKIE / PORTLAND UA	2 / MN / 5.72	14 / 0	MCLOUGHLIN BLVD / 17TH AVE	INTER / S / 05	CROSS / 0	N / TRF SIGNAL /	N	CLR / DRY / DARK	S-STRGHT / REAR / INJ	01	NONE / 0 / PRVTE	STRGHT / N / S											013	29
NONE		N									S				N													000		00
No						*45 26 43.37 -122 38 33.97*		008100200S00		1								PSNGR CAR		01	DRVR	INJC	33	M	OR-Y / OR<25		042	000		29
																	02	NONE / 0 / PRVTE	STRGHT / N / S						OR-Y			000	013	00
																		PSNGR CAR		01	DRVR	INJC	62	F	OR-Y / OR<25		000	000		00

081 PACIFIC HIGHWAY EAST — Intersectional Crashes at OR-99E, Pacific Hwy (#081), McLoughlin Blvd & SE 17th Ave / SE Harrison St
January 1, 2013 through December 31, 2017

SER# / INVEST / UNLOC?	SPED	ALC	DRUG/MJ	SCHWK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MILEPNT LRS	FC / MLG / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
															03	NONE 0	STRGHT									022	00
																PRVTE	N S										
																PSNGR CAR		01	DRVR	NONE	57	F	OR-Y		000	000	00
																							OR<25				
00831	N	N	N		03/10/2013	CLACKAMAS	1 14		INTER	CROSS	N		N	UNK	S-1STOP	01	NONE 0	STRGHT										07
NONE		N			Sun 9A	MILWAUKIE	MN 0	HARRISON ST	S		TRF SIGNAL		N	UNK	REAR		PRVTE	S N									000	00
						PORTLAND UA	5.72	MCLOUGHLIN BLVD	06	0			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	69	M	OR-Y		026	000	07
No	*45*	*26*	*43.37*	*-122*	*38 33.97*		008100100S00	1															OR<25				
															02	NONE 0	STOP										
																PRVTE	S N									011	00
																PSNGR CAR		01	DRVR	NONE	00	M	UNK		000	000	00
																							UNK				
01567	N	N	N		05/06/2013	CLACKAMAS	1 14		INTER	CROSS	N		N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE		N			Mon 3P	MILWAUKIE	MN 0	MCLOUGHLIN BLVD	S		TRF SIGNAL		N	DRY	REAR		UNKN	S N									000	00
						PORTLAND UA	5.72	17TH AVE	06	0			N	DAY	PDO		UNKNOWN		01	DRVR	NONE	00	U	UNK		026	000	07
No	*45*	*26*	*43.37*	*-122*	*38 33.97*		008100100S00	1															UNK				
															02	NONE 0	STOP										
																PRVTE	S N									011	00
																PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		000	000	00
																							OR<25				
01679	N	N	N	N	N 04/13/2016	CLACKAMAS	2 14		INTER	CROSS	N		N	CLD	S-1STOP	01	NONE 0	STRGHT										29
CITY		N			Wed 10A	MILWAUKIE	MN 0	HARRISON ST	S		TRF SIGNAL		N	DRY	REAR		PRVTE	S N									000	00
						PORTLAND UA	5.72	MCLOUGHLIN BLVD	06	0			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	64	F	OR-Y		026	000	29
No	*45*	*26*	*43.37*	*-122*	*38 33.97*		008100200S00	1															OR<25				
															02	NONE 0	STOP										
																PRVTE	S N									011	00
																PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		000	000	00
																							OR<25				
																		02	PSNG	INJC	38	F			000	000	00
05892	N	N	N		11/29/2016	CLACKAMAS	2 14		INTER	CROSS	N		N	CLR	O-OTHER	01	NONE 9	BACK										10
NONE		N			Tue 1P	MILWAUKIE	MN 0	HARRISON ST	S		TRF SIGNAL		N	DRY	BACK		N/A	N S									000	00
						PORTLAND UA	5.72	MCLOUGHLIN BLVD	06	0			N	DAY	PDO		TRUCK		01	DRVR	NONE	00	U	UNK		000	000	00
No	*45*	*26*	*43.37*	*-122*	*38 33.97*		008100200S00	1															UNK				
															02	NONE 9	STOP										
																N/A	S N									011	00
																PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000	00
																							UNK				

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SER# / INVEST / UNLOC?	SPED	ALC	DRUG/MJ	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC	CONN # FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR / OWNER / VEH TYPE	QTY	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
06184	N	N	N			12/28/2016	CLACKAMAS	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	9	STRGHT											29
NONE		N				Wed 10A	MILWAUKIE	MN 0		HARRISON ST	S		TRF SIGNAL	N	DRY	REAR		N/A		S N									000		00
							PORTLAND UA	5.72		MCLOUGHLIN BLVD	06	0		N	DAY	PDO		UNKNOWN			01	DRVR	NONE	00	U	UNK		000	000		00
No	*45 26*		*43.37 -122*		*38 33.97*			008100200	S00	1																UNK					
																	02	NONE	9	STOP											
																		N/A		S N									011		00
																		PSNGR CAR			01	DRVR	NONE	00	U	UNK		000	000		00
																										UNK					
00273	N	N	N			01/19/2017	CLACKAMAS	2	14		INTER	CROSS	N	N	UNK	S-1STOP	01	NONE	0	STRGHT											29
NONE		N				Thu 9A	MILWAUKIE	MN 0		MCLOUGHLIN BLVD	S		TRF SIGNAL	N	WET	REAR		PRVTE		S N									000		00
							PORTLAND UA	5.72		17TH AVE	06	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	26	F	OR-Y		026	000		29
No	*45 26*		*43.37 -122*		*38 33.97*			008100200	S00	1																OR<25					
																	02	NONE	0	STOP											
																		PRVTE		S N									011		00
																		PSNGR CAR			01	DRVR	INJC	38	F	OR-Y		000	000		00
																										OR<25					
03789	N	N	N	N	N	09/15/2015	CLACKAMAS	1	14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE	0	STRGHT											04
CITY		N				Tue 7P	MILWAUKIE	MN 0		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE		N S									000		00
							PORTLAND UA	5.72		MCLOUGHLIN BLVD	01	0		N	DUSK	INJ		PSNGR CAR			01	DRVR	NONE	30	M	OR-Y		097	000		00
No	*45 26*		*43.37 -122*		*38 33.97*			008100100	S00	1																OR<25					
																	02	NONE	0	TURN-L											
																		PRVTE		S W									000		00
																		PSNGR CAR			01	DRVR	INJC	22	F	SUSP		097	000		00
																										OR<25					
02128	N	N	N	N	N	06/15/2013	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT											04
COUNTY		N				Sat 3P	MILWAUKIE	MN 0		HARRISON ST	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE		S N									000		00
							PORTLAND UA	5.72		MCLOUGHLIN BLVD	02	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	67	F	OR-Y		000	000		00
No	*45 26*		*43.37 -122*		*38 33.97*			008100100	S00	1																OR<25					
																	02	POLCE	0	STRGHT											
																		PUBLC		W E									000		00
																		PSNGR CAR			01	DRVR	NONE	51	M	OR-Y		020	000		04
																										OR<25					
00218	Y	N	N	N	N	01/13/2017	CLACKAMAS	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT										124	01,04
CITY		N				Fri 6P	MILWAUKIE	MN 0		HARRISON ST	CN		TRF SIGNAL	N	ICE	TURN		PRVTE		S N									000	124	00
							PORTLAND UA	5.72		MCLOUGHLIN BLVD	02	0		N	DLIT	INJ		PSNGR CAR			01	DRVR	INJB	27	F	OR-Y		047,020	000		01,04
No	*45 26*		*43.37 -122*		*38 33.97*			008100200	S00	1																OR<25					

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																	02	NONE 0	TURN-R									
																		PUBLC	E N									000	00
																		OTH BUS		01	DRVR	INJC	60	M	OR-Y		000	000	00
																									OR<25				
02771	N	N	N	N	N	07/18/2014	CLACKAMAS	1	14		INTER	CROSS	N		N	CLR	ANGL-OTH	01	NONE 0	STRGHT									04
CITY		N				Fri 7P	MILWAUKIE	MN 0		HARRISON ST	CN		TRF SIGNAL		N	DRY	ANGL		PRVTE	N S								000	00
							PORTLAND UA	5.72		MCLOUGHLIN BLVD	03	0			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	60	F	OR-Y		000	000	00
No	*45*	*26*	*43.37*	*-122*	*38*	*33.97*		008100100S00		1															OR<25				
																	02	NONE 0	STRGHT									
																		PRVTE	W E									000	00
																		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		021	000	04
																									OR<25				
02339	N	N	N			05/24/2016	CLACKAMAS	2	14		INTER	CROSS	N		N	CLR	S-OTHER	01	NONE 9	TURN-L									08
NONE		N				Tue 2P	MILWAUKIE	MN 0		HARRISON ST	CN		TRF SIGNAL		N	DRY	TURN		N/A	E S								000	00
							PORTLAND UA	5.72		MCLOUGHLIN BLVD	03	0			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000	00
No	*45*	*26*	*43.37*	*-122*	*38*	*33.97*		008100200S00		1															UNK				
																	02	NONE 9	TURN-L									
																		N/A	E S									000	00
																		PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000	00
																									UNK				
02289	N	N	N	N	N	06/28/2013	CLACKAMAS	1	14		INTER	CROSS	N		N	CLR	ANGL-OTH	01	NONE 0	STRGHT									16,04
NONE		N				Fri 11A	MILWAUKIE	MN 0		HARRISON ST	CN		TRF SIGNAL		N	DRY	ANGL		PRVTE	W E								000	00
							PORTLAND UA	5.72		MCLOUGHLIN BLVD	04	0			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	74	M	OR-Y		020	025	16,04
No	*45*	*26*	*43.37*	*-122*	*38*	*33.97*		008100100S00		1															OR<25				
																	02	NONE 0	STRGHT									
																		PRVTE	S N									000	00
																		PSNGR CAR		01	DRVR	INJC	32	F	OR-Y		000	000	00
																									OR<25				
02013	N	N	N	N	N	05/27/2014	CLACKAMAS	1	14		INTER	CROSS	N		N	CLR	ANGL-OTH	01	NONE 0	STRGHT									04
CITY		N				Tue 6P	MILWAUKIE	MN 0		HARRISON ST	CN		TRF SIGNAL		N	DRY	ANGL		PRVTE	W E								000	00
							PORTLAND UA	5.72		MCLOUGHLIN BLVD	04	0			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	U	UNK		020	000	04
No	*45*	*26*	*43.37*	*-122*	*38*	*33.97*		008100100S00		1															UNK				
																	02	NONE 0	STRGHT									
																		PRVTE	S N									000	00
																		PSNGR CAR		01	DRVR	INJC	44	F	OR-Y		000	000	00
																									OR<25				
																				02	PSNG	INJC	09	F			000	000	00

081 PACIFIC HIGHWAY EAST — Intersectional Crashes at OR-99E, Pacific Hwy (#081), McLoughlin Blvd & SE 17th Ave / SE Harrison St
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																03	NONE 0 PRVTE	STOP E W									011		00
																	PSNGR CAR		01	DRVR	INJC	42	F	OR-Y OR<25		000	000		00
00490 CITY	N	N	N	N	N	02/06/2017 Mon 1P	CLACKAMAS MILWAUKIE PORTLAND UA	2 MN 5.72	14 0 HARRISON ST MCLOUGHLIN BLVD	INTER CN 04	CROSS 0	N TRF SIGNAL	N	CLD WET DAY	O-1 L-TURN TURN INJ	01	NONE 0 PRVTE	STRGHT S N										013	02,08,04
																	PSNGR CAR		01	DRVR	NONE	28	M	OR-Y OR<25		000	000		00
No						*45 26 43.37 -122 38 33.97*		008100200S00	1																				
																02	NONE 0 PRVTE	TURN-L N E									000	013	00
																	PSNGR CAR		01	DRVR	NONE	30	M	SUSP OR<25		028,004,020	000		02,08,04
																03	NONE 0 PRVTE	STOP E W									022		00
																	PSNGR CAR		01	DRVR	INJB	45	M	OR-Y OR<25		000	000		00

CITY OF MILWAUKIE, CLACKAMAS COUNTY

Intersectional Crashes at OR-99E, Pacific Hwy (#081), McLoughlin Blvd & SE 17th Ave / SE Harrison St

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SER# / INVEST / UNLOC?	SPED	ALC	DRUG/MJ	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
02108	N	N	N			05/10/2016	16	HARRISON ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										006	29
NONE			N			Tue 1P	0	MCLOUGHLIN BLVD	E		TRF SIGNAL	N	DRY	REAR		N/A	E W										000		00
No	*45 26 43.37*					*-122 38 33.97*		1	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		000	000		00
															02	NONE 9	STOP											
																N/A	E W										011		00
																PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		000	000		00
02029	N	N	N			06/09/2013	17	MCLOUGHLIN BLVD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE			N			Sun 1P	0	17TH AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000		00
No	*45 26 43.37*					*-122 38 33.97*		1	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y UNK		026	000		07
															02	NONE 0	STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	NONE	55	F	OR-Y OR<25		000	000		00
01805	N	N	N	N	N	04/20/2016	16	MCLOUGHLIN BLVD	INTER	CROSS	N	N	RAIN	BIKE	01	NONE 0	STRGHT											27
CITY			N			Wed 6P	0	17TH AVE	W		TRF SIGNAL	N	WET	ANGL		PRVTE	W E									000		00
No	*45 26 43.37*					*-122 38 33.97*		1	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	36	F	OR-Y OR<25		016,027	038		27
																	STRGHT	01	BIKE	INJB	54	M		01	000	035		00
																	S N											

OREGON DEPARTMENT OF TRANSPORTATION - POLICY, DATA AND ANALYSIS DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

Intersectional Crashes at SE 17th Ave & SE Lava Dr

January 1, 2013 through December 31, 2017

SER# / INVEST / UNLOC?	SPED	ALC	DRUG/MJ	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
03993	Y	Y	N	N	N	10/09/2014	17	LAVA DR	INTER	3-LEG	N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT										116,058	30,27
CITY			N			Thu 9P	0	17TH AVE	S		STOP SIGN	N	DRY	FIX		PRVTE	N S									000	058	00
No	*45 26 50.85*					*-122 38 36.30*		1	05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	34	M	OR-Y OR<25		050,016	038	116	30,27
06111	N	N	N	N	N	12/27/2016	16	LAVA DR	INTER	3-LEG	N	Y	CLD	FIX OBJ	01	NONE 0	STRGHT										044	10
CITY			N			Tue 6P	0	17TH AVE	NW		STOP SIGN	N	WET	FIX		PRVTE	SE NW									000	044	00
No	*45 26 50.98*					*-122 38 36.35*		1	05	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	50	F	OR-Y OR<25		080	000		10

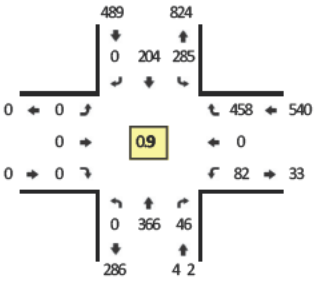
Attachment C – Traffic Count Data

ype of peak hour be ng reported: ntersect on Peak

Method for determ n ng peak hour: ota Enter ng Vo ume

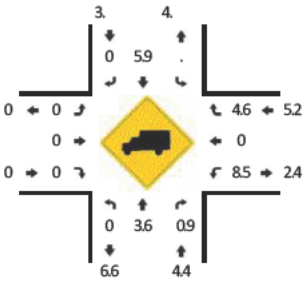
LOCATION: SE 17th Ave -- Milwaukie Expy
CITY/STATE: Milwaukie, OR

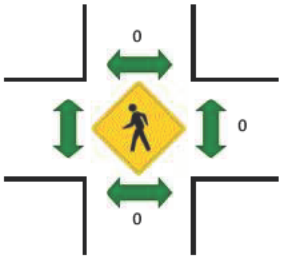
QC JOB #: 15240501
DATE: Tue, Jun 3 2014

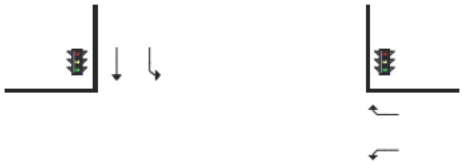


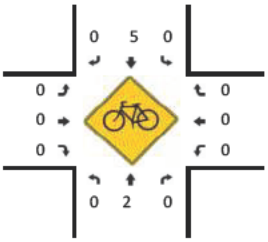
Peak-Hour: **7:25** AM -- **8:25** AM
Peak 15-Min: **7:40** AM -- **7:55** AM

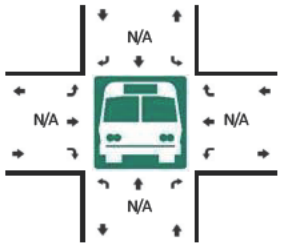
Quality Counts
DATA THAT DRIVES COMMUNITIES

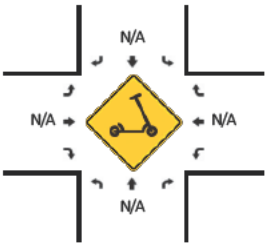












5 M n Count Per od Beg nn ng At	SE 17th Ave (Northbound)				SE 17th Ave (Southbound)				M wauk e Expy (Eastbound)				M wauk e Expy (Westbound)				ota	Hour y ota s
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U		
7:00 AM	0	24	0	0	25	15	0	0	0	0	0	0	3	0	35	0	102	
7:05 AM	0	17	1	0	12	11	0	0	0	0	0	0	7	0	27	0	75	
7:10 AM	0	13	1	0	20	15	0	0	0	0	0	0	13	0	42	0	104	
7:15 AM	0	29	2	0	16	15	0	0	0	0	0	0	2	0	56	0	120	
7:20 AM	0	32	2	0	15	12	0	0	0	0	0	0	5	0	29	0	95	
7:25 AM	0	36	3	0	37	9	0	0	0	0	0	0	12	0	47	0	144	
7:30 AM	0	31	7	0	20	13	0	0	0	0	0	0	11	0	40	0	122	
7:35 AM	0	36	6	0	22	14	0	0	0	0	0	0	8	0	27	0	113	
7:40 AM	0	26	4	0	27	19	0	0	0	0	0	0	5	0	41	0	122	
7:45 AM	0	31	6	0	29	18	0	0	0	0	0	0	12	0	57	0	153	
7:50 AM	0	33	1	0	18	20	0	0	0	0	0	0	8	0	40	0	120	
7:55 AM	0	24	2	0	24	20	0	0	0	0	0	0	3	0	48	0	121	1391
8:00 AM	0	30	2	0	28	14	0	0	0	0	0	0	5	0	35	0	114	1403
8:05 AM	0	25	3	0	28	16	0	0	0	0	0	0	4	0	27	0	103	1431
8:10 AM	0	33	4	0	22	21	0	0	0	0	0	0	4	0	25	0	109	1436
8:15 AM	0	36	6	0	19	24	0	0	0	0	0	0	3	0	26	0	114	1430
8:20 AM	0	25	2	0	11	16	0	0	0	0	0	0	7	0	45	0	106	1441
8:25 AM	0	24	4	0	23	18	0	0	0	0	0	0	2	0	20	0	91	1388
8:30 AM	0	13	3	0	16	13	0	0	0	0	0	0	8	0	32	0	85	1351
8:35 AM	0	23	3	0	13	18	0	0	0	0	0	0	4	0	29	0	90	1328
8:40 AM	0	19	10	0	17	14	0	0	0	0	0	0	6	0	28	0	94	1300
8:45 AM	0	23	3	0	17	14	0	0	0	0	0	0	7	0	34	0	98	1245
8:50 AM	0	20	2	0	23	16	0	0	0	0	0	0	4	0	26	0	91	1216
8:55 AM	0	28	2	0	20	15	0	0	0	0	0	0	3	0	18	0	86	1181

Peak 15 M n F owrates	Northbound				Southbound				Eastbound				Westbound				ota
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	
A Veh c es	0	360	44	0	296	228	0	0	0	0	0	0	100	0	552	0	1580
Heavy Trucks	0	16	4		4	8	0		0	0	0		4	0	24		60
Buses																	
Pedestr ans		0				0				4				0			4
B cyc es	0	20	0		0	8	0		0	0	0		0	0	0		28
Scooters																	

Comments:

Report generated on 6/4/2020 3:20 PM

SOURCE: Qua ty Counts, LLC (http://www qua tycounts net) 1 877 580 2212

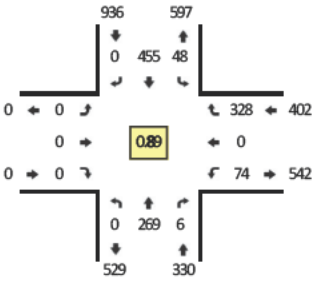
ype of peak hour be ng reported: ntersect on Peak

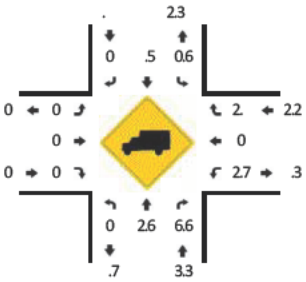
Method for determ n ng peak hour: ota Enter ng Vo ume

LOCATION: SE 17th Ave -- Milwaukie Expy
CITY/STATE: Milwaukie, OR

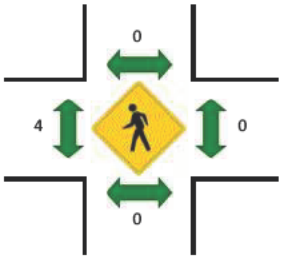
QC JOB #: 15240502
DATE: Tue, Jun 3 2014

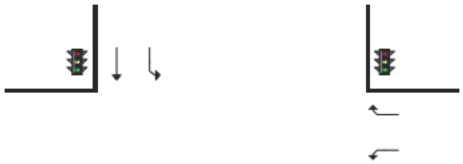
Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:20 PM -- 5:35 PM

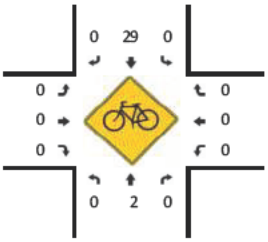


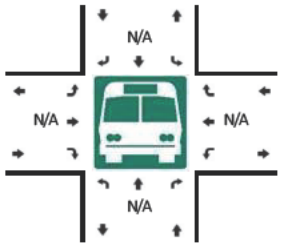


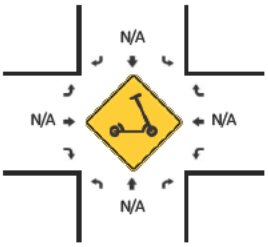
Quality Counts
DATA THAT DRIVES COMMUNITIES











5 M n Count Per od Beg nn ng At	SE 17th Ave (Northbound)				SE 17th Ave (Southbound)				M wauk e Expy (Eastbound)				M wauk e Expy (Westbound)				ota	Hour y ota s
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U		
4:00 PM	0	19	5	0	25	31	0	0	0	0	0	0	6	0	27	0	113	
4:05 PM	0	15	7	0	36	31	0	0	0	0	0	0	2	0	18	0	109	
4:10 PM	0	34	6	0	46	35	0	0	0	0	0	0	5	0	20	0	146	
4:15 PM	0	14	6	0	26	28	0	0	0	0	0	0	6	0	33	0	113	
4:20 PM	0	21	7	0	38	43	0	0	0	0	0	0	4	0	20	0	133	
4:25 PM	0	15	3	0	51	38	0	0	0	0	0	0	11	0	25	0	143	
4:30 PM	0	28	7	0	32	52	0	0	0	0	0	0	8	0	18	0	145	
4:35 PM	0	22	17	0	44	38	0	0	0	0	0	0	2	0	26	0	149	
4:40 PM	0	20	4	0	31	35	0	0	0	0	0	0	9	0	18	0	117	
4:45 PM	0	23	4	0	29	37	0	0	0	0	0	0	8	0	26	0	127	
4:50 PM	0	21	10	0	28	31	0	0	0	0	0	0	6	0	24	0	120	
4:55 PM	0	23	4	0	41	42	0	0	0	0	0	0	1	0	24	0	135	1550
5:00 PM	0	19	5	0	41	40	0	0	0	0	0	0	6	0	33	0	144	1581
5:05 PM	0	25	4	0	42	40	0	0	0	0	0	0	5	0	23	0	139	1611
5:10 PM	0	10	6	0	45	31	0	0	0	0	0	0	5	0	18	0	115	1580
5:15 PM	0	19	6	0	40	43	0	0	0	0	0	0	8	0	28	0	144	1611
5:20 PM	0	20	5	0	33	45	0	0	0	0	0	0	7	0	34	0	144	1622
5:25 PM	0	20	3	0	45	31	0	0	0	0	0	0	14	0	24	0	137	1616
5:30 PM	0	40	9	0	46	60	0	0	0	0	0	0	9	0	21	0	185	1656
5:35 PM	0	24	6	0	28	24	0	0	0	0	0	0	9	0	33	0	124	1631
5:40 PM	0	26	6	0	38	36	0	0	0	0	0	0	1	0	31	0	138	1652
5:45 PM	0	19	3	0	47	29	0	0	0	0	0	0	4	0	24	0	126	1651
5:50 PM	0	24	4	0	35	34	0	0	0	0	0	0	5	0	35	0	137	1668
5:55 PM	0	18	7	0	30	35	0	0	0	0	0	0	5	0	26	0	121	1654

Peak 15 M n F owrates	Northbound				Southbound				Eastbound				Westbound				ota
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	
A Veh c es	0	320	68	0	496	544	0	0	0	0	0	0	120	0	316	0	1864
Heavy Trucks	0	16	4		4	8	0		0	0	0		0	0	12		44
Buses																	
Pedestr ans		0				0				4				0			4
B cyc es	0	0	0		0	32	0		0	0	0		0	0	0		32
Scooters																	

Comments:

Report generated on 6/4/2020 3:20 PM

SOURCE: Qua ty Counts, LLC (http://www qua tycounts net) 1 877 580 2212

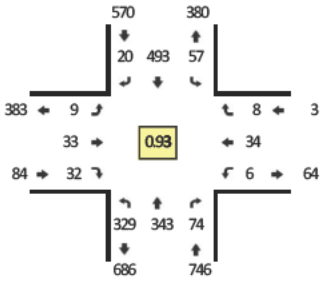
ype of peak hour be ng reported: ntersect on Peak

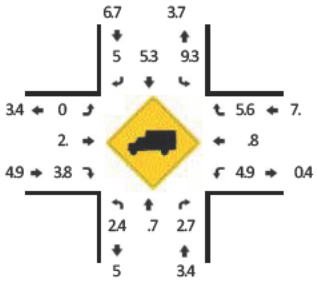
Method for determ n ng peak hour: ota Enter ng Vo ume

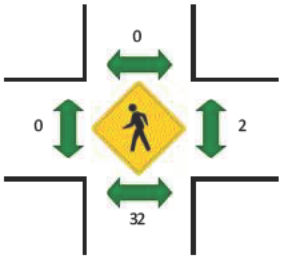
LOCATION: Hwy 99E -- SE Harrison St/17th St
CITY/STATE: Milwaukie, OR

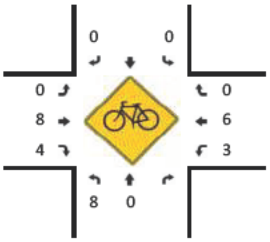
QC JOB #: 15240503
DATE: Tue, Jun 3 2014

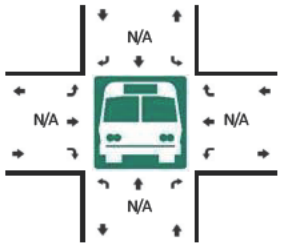
Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:10 AM -- 7:25 AM

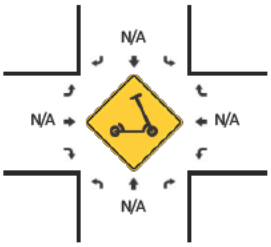












5 M n Count Per od Beg nn ng At	Hwy 99E (Northbound)				Hwy 99E (Southbound)				SE Harr son St/17th St (Eastbound)				SE Harr son St/17th St (Westbound)				ota	Hour y ota s
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U		
7:00 AM	22	102	4	0	2	29	1	0	2	2	8	0	6	1	2	0	181	
7:05 AM	18	118	2	0	3	42	1	0	1	1	10	0	2	2	2	0	202	
7:10 AM	21	123	9	0	4	30	3	0	4	2	13	0	9	0	2	0	220	
7:15 AM	23	139	4	0	4	36	1	0	0	3	10	0	9	0	0	0	229	
7:20 AM	40	135	6	0	6	45	4	0	0	3	8	0	5	2	2	0	256	
7:25 AM	19	127	5	0	3	33	1	0	1	3	5	0	6	2	2	0	207	
7:30 AM	36	116	5	0	3	30	0	0	2	5	6	0	5	7	2	0	217	
7:35 AM	23	108	8	0	4	60	1	0	0	5	13	0	0	3	1	0	226	
7:40 AM	29	88	9	0	5	44	2	0	2	2	12	0	8	3	1	0	205	
7:45 AM	31	87	6	0	9	56	2	0	1	6	15	0	3	3	2	0	221	
7:50 AM	42	132	7	0	2	35	1	0	1	0	13	0	7	6	3	0	249	
7:55 AM	15	86	6	0	8	55	3	0	4	0	11	0	4	1	1	0	194	2607
8:00 AM	32	84	7	0	6	27	1	0	3	3	16	0	3	5	0	0	187	2613
8:05 AM	14	91	4	0	8	54	0	0	0	0	10	0	4	2	2	0	189	2600
8:10 AM	42	88	9	0	11	27	1	0	2	6	15	0	7	7	1	0	216	2596
8:15 AM	24	104	9	0	7	42	1	0	0	9	17	0	7	3	4	0	227	2594
8:20 AM	26	81	7	0	9	46	0	1	1	11	20	0	10	10	2	0	224	2562
8:25 AM	14	94	3	0	14	55	2	0	0	6	7	0	5	3	1	0	204	2559
8:30 AM	19	85	6	0	5	18	3	0	2	11	10	0	9	8	3	0	179	2521
8:35 AM	10	93	11	0	8	42	4	0	0	1	14	0	4	4	1	0	192	2487
8:40 AM	24	86	4	0	7	27	1	0	2	7	12	1	7	3	1	0	182	2464
8:45 AM	17	83	4	0	9	66	2	0	3	4	12	0	8	6	1	0	215	2458
8:50 AM	24	71	4	0	2	32	2	0	0	7	18	0	8	7	5	0	180	2389
8:55 AM	19	58	6	0	9	42	2	0	0	3	12	0	6	1	2	0	160	2355

Peak 15 M n F owrates	Northbound				Southbound				Eastbound				Westbound				ota
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	
A Veh c es	336	1588	76	0	56	444	32	0	16	32	124	0	92	8	16	0	2820
Heavy Trucks	8	32	0		12	28	4		0	4	0		4	4	4		100
Buses																	
Pedestr ans		12				0				0				0			12
B cyc es	12	0	0		0	4	0		0	4	12		4	4	0		40
Scooters																	

Comments:

Report generated on 6/4/2020 3:20 PM

SOURCE: Qua ty Counts, LLC (http://www qua tycounts net) 1 877 580 2212

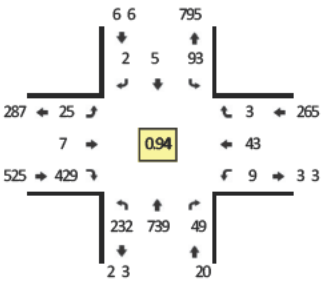
ype of peak hour be ng reported: ntersect on Peak

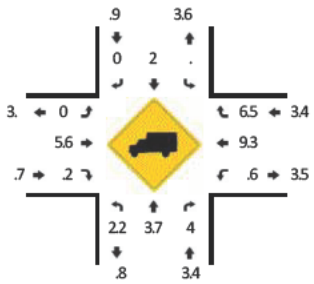
Method for determ n ng peak hour: ota Enter ng Vo ume

LOCATION: Hwy 99E -- SE Harrison St/17th St
CITY/STATE: Milwaukie, OR

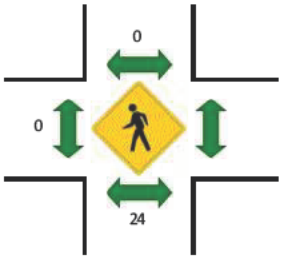
QC JOB #: 15240504
DATE: Tue, Jun 3 2014

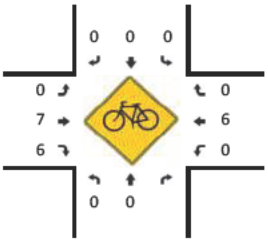
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

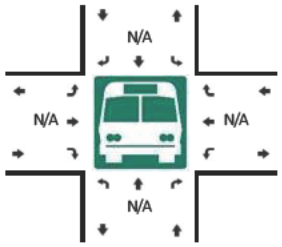


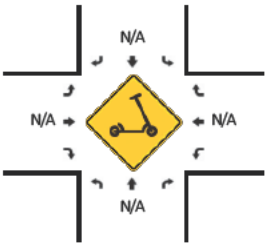


Quality Counts
DATA THAT DRIVES COMMUNITIES









5 M n Count Per od Beg nn ng At	Hwy 99E (Northbound)				Hwy 99E (Southbound)				SE Harr son St/17th St (Eastbound)				SE Harr son St/17th St (Westbound)				ota	Hour y ota s
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U		
4:00 PM	10	32	4	0	6	96	0	0	1	4	32	0	13	0	3	0	201	
4:05 PM	23	56	10	0	7	119	0	0	2	3	29	0	14	2	2	0	267	
4:10 PM	17	54	4	0	13	91	2	1	2	8	33	0	24	5	4	0	258	
4:15 PM	17	67	14	0	9	127	2	1	2	4	23	0	14	4	1	0	285	
4:20 PM	15	49	6	0	8	118	1	0	3	8	37	0	17	7	3	0	272	
4:25 PM	24	64	8	0	10	133	1	0	1	4	42	0	10	3	3	0	303	
4:30 PM	12	37	3	0	4	122	0	0	1	8	30	0	24	5	1	0	247	
4:35 PM	21	70	14	0	4	119	2	0	5	7	46	0	13	2	5	0	308	
4:40 PM	18	41	10	0	9	112	0	0	2	9	40	0	20	4	5	0	270	
4:45 PM	22	81	12	0	9	159	1	0	0	5	28	0	16	9	1	0	343	
4:50 PM	10	47	7	0	12	114	0	0	4	4	24	0	20	6	2	0	250	
4:55 PM	24	57	15	0	5	122	1	0	3	6	40	0	13	0	3	0	289	3293
5:00 PM	14	65	8	0	10	127	2	0	0	4	37	0	19	4	1	0	291	3383
5:05 PM	16	62	18	0	4	111	2	0	1	4	45	0	11	1	0	0	275	3391
5:10 PM	19	57	13	0	11	122	0	0	4	2	33	0	12	2	2	0	277	3410
5:15 PM	28	82	12	0	8	128	0	0	1	5	37	0	19	2	3	0	325	3450
5:20 PM	15	64	10	0	8	127	1	0	2	12	34	0	23	5	7	0	308	3486
5:25 PM	30	58	14	0	3	146	0	0	2	5	30	0	10	2	1	0	301	3484
5:30 PM	15	55	16	0	10	124	3	0	1	8	35	0	15	6	1	0	289	3526
5:35 PM	21	67	5	0	9	106	0	0	8	4	43	0	21	5	2	1	292	3510
5:40 PM	14	53	13	0	5	112	1	0	3	6	36	0	14	5	1	0	263	3503
5:45 PM	22	69	13	0	6	116	0	0	3	2	35	0	7	4	2	0	279	3439
5:50 PM	15	43	13	0	12	126	1	0	4	4	30	0	18	4	4	0	274	3463
5:55 PM	23	57	13	0	6	140	1	0	0	2	29	0	11	2	2	0	286	3460

Peak 15 M n F owrates	Northbound				Southbound				Eastbound				Westbound				ota
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	
A Veh c es	292	816	144	0	76	1604	4	0	20	88	404	0	208	36	44	0	3736
Heavy Trucks	4	24	0		0	32	0		0	4	0		0	4	0		68
Buses																	
Pedestr ans		4				0				0				0			4
B cyc es	0	0	4		0	0	0		0	0	12		0	8	0		24
Scooters																	

Comments:

Report generated on 6/4/2020 3:20 PM

SOURCE: Qua ty Counts, LLC (http://www qua tycounts net) 1 877 580 2212

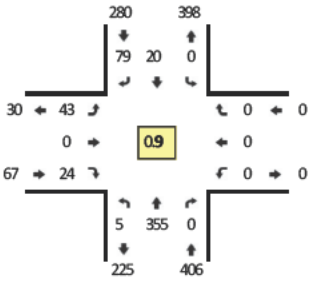
ype of peak hour be ng reported: ntersect on Peak

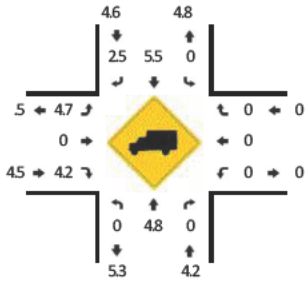
Method for determ n ng peak hour: ota Enter ng Vo ume

LOCATION: SE 17th Ave -- SE Lava Dr
CITY/STATE: Milwaukie, OR

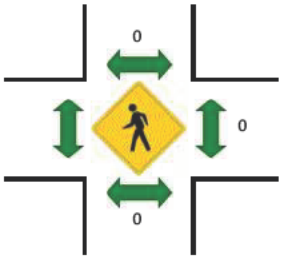
QC JOB #: 15240505
DATE: Tue, Jun 3 2014

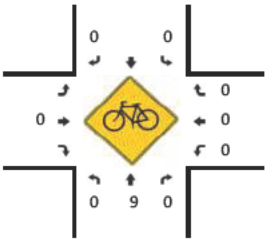
Peak-Hour: **7:30** AM -- **8:30** AM
Peak 15-Min: **7:45** AM -- **8:00** AM

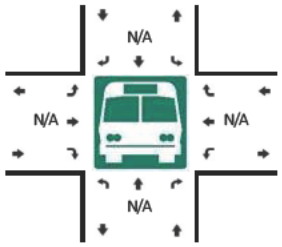


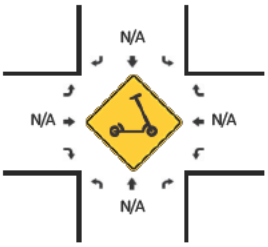


Quality Counts
DATA THAT DRIVES COMMUNITIES









5 M n Count Per od Beg nn ng At	SE 17th Ave (Northbound)				SE 17th Ave (Southbound)				SE Lava Dr (Eastbound)				SE Lava Dr (Westbound)				ota	Hour y ota s
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U		
7:00 AM	3	22	0	0	0	15	3	0	1	0	1	0	0	0	0	0	45	
7:05 AM	3	18	0	0	0	7	9	0	0	0	3	0	0	0	0	0	40	
7:10 AM	6	17	0	0	0	16	8	0	0	0	2	0	0	0	0	0	49	
7:15 AM	1	24	0	0	0	14	8	0	4	0	0	0	0	0	0	0	51	
7:20 AM	7	33	0	0	0	9	8	0	6	0	1	0	0	0	0	0	64	
7:25 AM	4	24	0	0	0	9	12	0	6	0	2	0	0	0	0	0	57	
7:30 AM	4	35	0	0	0	9	10	0	6	0	2	0	0	0	0	0	66	
7:35 AM	2	29	0	0	0	14	12	0	6	0	3	0	0	0	0	0	66	
7:40 AM	5	30	0	0	0	14	6	0	3	0	2	0	0	0	0	0	60	
7:45 AM	5	28	0	0	0	15	6	0	1	0	2	0	0	0	0	0	57	
7:50 AM	7	30	0	0	0	18	8	0	5	0	2	0	0	0	0	0	70	
7:55 AM	7	38	0	0	0	15	16	0	1	0	4	0	0	0	0	0	81	706
8:00 AM	5	18	0	0	0	15	7	0	2	0	2	0	0	0	0	0	49	710
8:05 AM	2	35	0	0	0	15	7	0	3	0	1	0	0	0	0	0	63	733
8:10 AM	0	18	0	0	0	16	1	0	3	0	0	0	0	0	0	0	38	722
8:15 AM	6	40	0	0	0	24	4	0	5	0	2	0	0	0	0	0	81	752
8:20 AM	4	25	0	0	0	23	1	0	6	0	3	0	0	0	0	0	62	750
8:25 AM	4	29	0	0	0	23	1	0	2	0	1	0	0	0	0	0	60	753
8:30 AM	1	19	0	0	0	17	3	0	3	0	5	0	0	0	0	0	48	735
8:35 AM	8	22	0	0	0	11	7	0	2	0	1	0	0	0	0	0	51	720
8:40 AM	5	16	0	0	0	21	3	0	2	0	3	0	0	0	0	0	50	710
8:45 AM	4	22	0	0	0	20	4	0	5	0	2	0	0	0	0	0	57	710
8:50 AM	5	24	0	0	0	12	2	0	3	0	4	0	0	0	0	0	50	690
8:55 AM	4	24	0	0	0	18	5	0	1	0	3	0	0	0	0	0	55	664

Peak 15 M n F owrates	Northbound				Southbound				Eastbound				Westbound				ota
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	
A Veh c es	76	384	0	0	0	192	120	0	28	0	32	0	0	0	0	0	832
Heavy Trucks	0	12	0		0	4	4		0	0	4		0	0	0		24
Buses																	
Pedestr ans		0				0				0				0			0
B cyc es	0	24	0		0	16	0		4	0	0		0	0	0		44
Scooters																	

Comments:

Report generated on 6/4/2020 3:20 PM

SOURCE: Qua ty Counts, LLC (http://www qua tycounts net) 1 877 580 2212

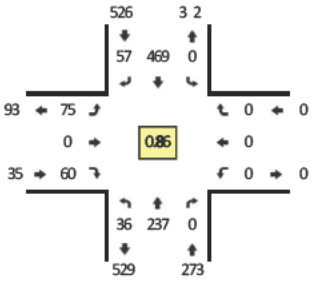
ype of peak hour be ng reported: ntersect on Peak

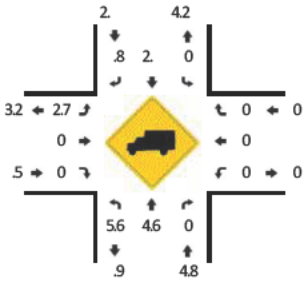
Method for determ n ng peak hour: ota Enter ng Vo ume

LOCATION: SE 17th Ave -- SE Lava Dr
CITY/STATE: Milwaukie, OR

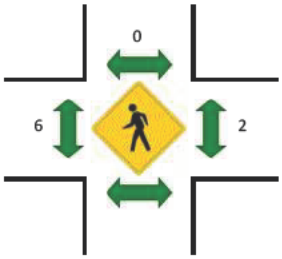
QC JOB #: 15240506
DATE: Tue, Jun 3 2014

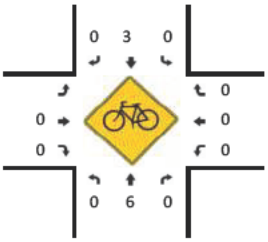
Peak-Hour: 4:20 PM -- 5:20 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

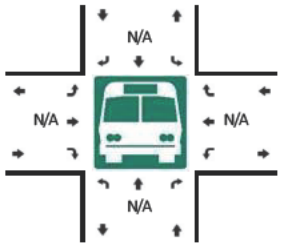


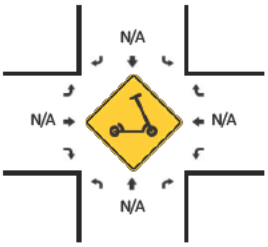


Quality Counts
DATA THAT DRIVES COMMUNITIES









5 M n Count Per od Beg nn ng At	SE 17th Ave (Northbound)				SE 17th Ave (Southbound)				SE Lava Dr (Eastbound)				SE Lava Dr (Westbound)				ota	Hour y ota s
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U		
4:00 PM	1	18	0	0	0	32	4	0	6	0	5	0	0	0	0	0	66	
4:05 PM	0	16	0	0	0	32	4	0	5	0	5	0	0	0	0	0	62	
4:10 PM	2	30	0	0	0	33	3	0	11	0	4	0	0	0	0	0	83	
4:15 PM	3	13	0	0	0	27	5	0	7	0	3	0	0	0	0	0	58	
4:20 PM	3	25	0	0	0	48	2	0	2	0	4	0	0	0	0	0	84	
4:25 PM	4	15	0	0	0	41	9	0	3	0	2	0	0	0	0	0	74	
4:30 PM	3	23	0	0	0	51	4	0	13	0	8	0	0	0	0	0	102	
4:35 PM	1	16	0	0	0	34	4	0	19	0	10	0	0	0	0	0	84	
4:40 PM	0	30	0	0	0	40	6	0	2	0	8	0	0	0	0	0	86	
4:45 PM	7	16	0	0	0	39	7	0	1	0	3	0	0	0	0	0	73	
4:50 PM	3	21	0	0	0	29	3	0	11	0	6	0	0	0	0	0	73	
4:55 PM	0	17	0	0	0	36	3	0	7	0	6	0	0	0	0	0	69	914
5:00 PM	7	21	0	0	0	40	3	0	3	0	2	0	0	0	0	0	76	924
5:05 PM	2	11	0	0	0	40	4	0	8	0	3	0	0	0	0	0	68	930
5:10 PM	2	24	0	0	0	36	5	0	3	0	3	0	0	0	0	0	73	920
5:15 PM	4	18	0	0	0	35	7	0	3	0	5	0	0	0	0	0	72	934
5:20 PM	3	22	0	0	0	42	3	0	3	0	4	0	0	0	0	0	77	927
5:25 PM	1	20	0	0	0	35	5	0	4	0	3	0	0	0	0	0	68	921
5:30 PM	4	29	0	0	0	44	5	0	7	0	8	0	0	0	0	0	97	916
5:35 PM	2	19	0	0	0	37	6	0	15	0	14	0	0	0	0	0	93	925
5:40 PM	2	21	0	0	0	35	4	0	10	0	5	0	0	0	0	0	77	916
5:45 PM	3	14	0	0	0	36	3	0	6	0	5	0	0	0	0	0	67	910
5:50 PM	1	26	0	0	0	31	4	0	4	0	3	0	0	0	0	0	69	906
5:55 PM	1	19	0	0	0	33	4	0	6	0	1	0	0	0	0	0	64	901

Peak 15 M n F owrates	Northbound				Southbound				Eastbound				Westbound				ota
	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	Left	hru	R ght	U	
A Veh c es	16	276	0	0	0	500	56	0	136	0	104	0	0	0	0	0	1088
Heavy Trucks	4	8	0		0	12	4		4	0	0		0	0	0		32
Buses																	
Pedestr ans		0				0				8				0			8
B cyc es	0	4	0		0	28	0		4	0	0		0	0	0		36
Scooters																	

Comments:

Report generated on 6/4/2020 3:20 PM

SOURCE: Qua ty Counts, LLC (http://www qua tycounts net) 1 877 580 2212

Transportation Volume Tables					
TVT	0.25 mile north of Clackamas Highway (OR224)				
Year	2014	2015	2016	2017	2018
AADT	38300	41200	33000	33300	33400
GR	1	1.08	0.80	1.01	1.00
TVT	0.05 mile north of Harrison Street				
AADT	26200	28200	33700	34000	34200
GR	1	1.08	1.20	1.01	1.01
TVT	0.02 mile south of Jefferson Street				
AADT	26900	29000	30600	30800	31000
GR	1	1.08	1.06	1.01	1.01
AVERAGE GROWTH RATE			**2.7%**		

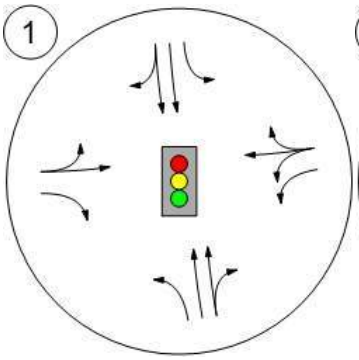
Detector Counts	OR 99E@17th St/Harrison St		Annual Growth Rate	OR 224@17th St		Annual Growth Rate
	Total Entering Volumes (TEV)			Total Entering Volumes (TEV)		
Date	Mar-18	Mar-19		Mar-19	Feb-20	
PM Peak Hour	3485	3348	**-3.9%**	1617	1492	**-7.7%**

Turning Movement Counts	OR 99E@17th St/Harrison St		Annual Growth Rate	OR 224@17th St		Annual Growth Rate
	TSP data	Historical data		TSP data	Historical data	
Date	11/29/2006	6/3/2014		11/29/2006	6/3/2014	
PM Peak Hour	3852	2598	**-4.1%**	2080	1656	**-2.5%**

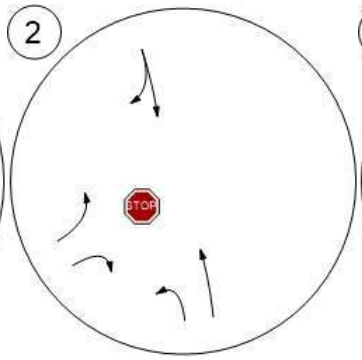
Attachment D – Existing Traffic Level-of-Service Worksheets

Lane Configuration and Traffic Control

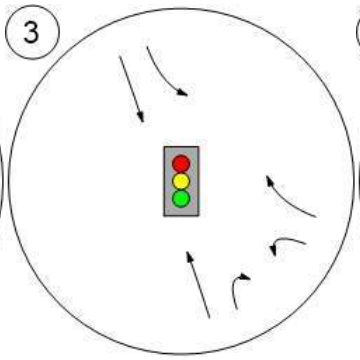
OR 99W / Harrison St / 17th



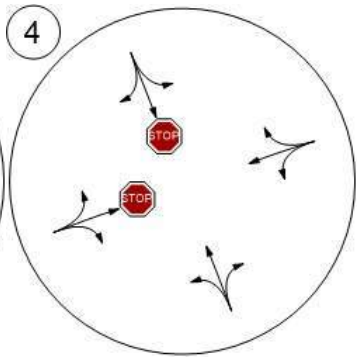
Lava Dr / 17th Ave



OR 224 / 17th Ave

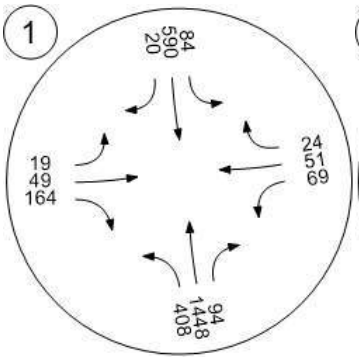


Waverly Ct / Lava Dr

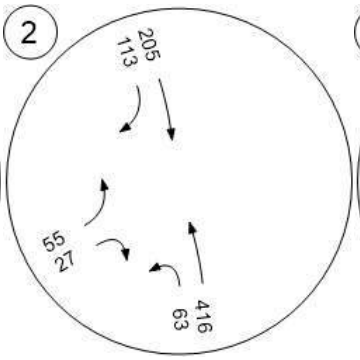


Traffic Volume

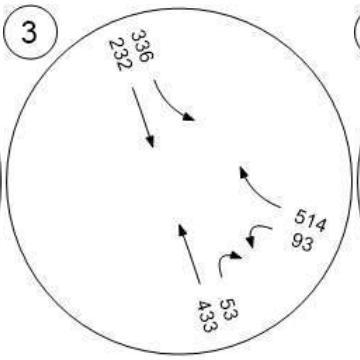
OR 99W / Harrison St / 17th



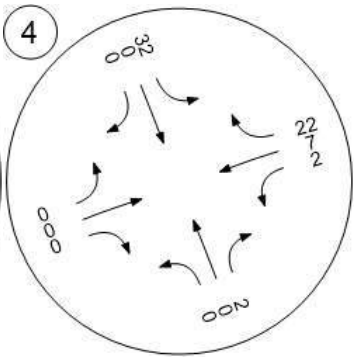
Lava Dr / 17th Ave



OR 224 / 17th Ave

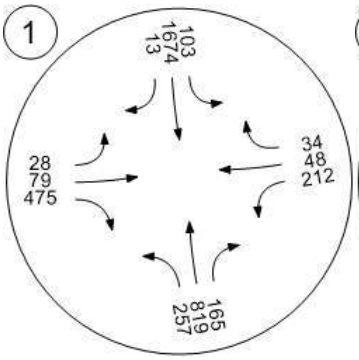


Waverly Ct / Lava Dr

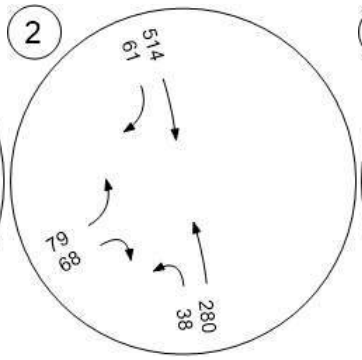


Traffic Volume

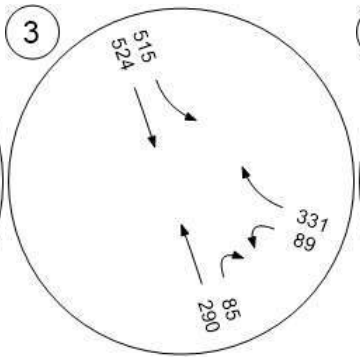
OR 99W / Harrison St / 17th



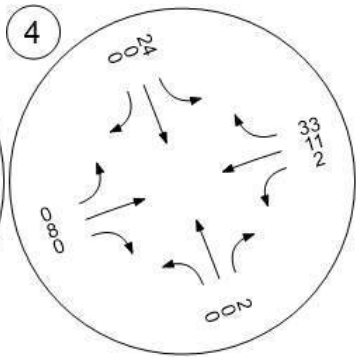
Lava Dr / 17th Ave



OR 224 / 17th Ave



Waverly Ct / Lava Dr



Intersection Level Of Service Report
Intersection 1: OR 99W / Harrison St / 17th St

Control Type:	Signalized	Delay (sec / veh):	33.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.678

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	370.00	100.00	100.00	375.00	100.00	100.00	100.00	100.00	150.00	135.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	408	1448	94	84	590	20	19	49	164	69	51	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	4.00	5.00	11.00	7.00	2.00	6.00	10.00	4.00	7.00	11.00	5.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	82	0	0	0
Total Hourly Volume [veh/h]	408	1448	94	84	590	20	19	49	82	69	51	24
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	104	369	24	21	151	5	5	13	21	18	13	6
Total Analysis Volume [veh/h]	416	1478	96	86	602	20	19	50	84	70	52	24
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	15			0			15			0		
v_di, Inbound Pedestrian Volume crossing m	15			0			15			0		
v_co, Outbound Pedestrian Volume crossing	1			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	10			0			13			8		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	93.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Overlap	Split	Split	Split
Signal Group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lag	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	4	10	0	6	10	0	0	6	6	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	0.0	3.5	3.5	0.0	4.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0
Split [s]	34	56	0	20	42	0	0	26	26	0	18	0
Vehicle Extension [s]	2.3	6.1	0.0	2.3	6.1	0.0	0.0	2.3	2.3	0.0	2.3	0.0
Walk [s]	0	7	0	0	11	0	0	8	8	0	5	0
Pedestrian Clearance [s]	0	17	0	0	18	0	0	21	21	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.5	0.0
Minimum Recall	No	Yes		No	Yes			No	No		No	
Maximum Recall	No	No		No	No			No	No		No	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.50	2.50
g_i, Effective Green Time [s]	30	71	71	8	49	49	16	63	9	9
g / C, Green / Cycle	0.25	0.60	0.60	0.06	0.41	0.41	0.13	0.52	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.24	0.43	0.44	0.05	0.17	0.17	0.04	0.05	0.04	0.06
s, saturation flow rate [veh/h]	1752	1840	1794	1652	1795	1775	1726	1549	1360	1559
c, Capacity [veh/h]	438	1096	1069	107	737	729	223	811	141	148
d1, Uniform Delay [s]	44.28	17.14	17.48	55.36	25.24	25.25	47.40	14.45	55.41	54.71
k, delay calibration	0.40	0.50	0.50	0.07	0.50	0.50	0.07	0.07	0.07	0.07
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	28.08	4.05	4.53	8.23	1.79	1.81	0.48	0.03	1.13	2.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.72	0.74	0.80	0.42	0.42	0.31	0.10	0.40	0.60
d, Delay for Lane Group [s/veh]	72.36	21.19	22.01	63.60	27.03	27.06	47.87	14.48	56.54	57.13
Lane Group LOS	E	C	C	E	C	C	D	B	E	E
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	15.48	15.80	16.20	2.81	6.71	6.65	1.91	1.16	1.73	2.75
50th-Percentile Queue Length [ft/ln]	387.08	395.06	404.97	70.31	167.86	166.24	47.72	29.09	43.29	68.78
95th-Percentile Queue Length [veh/ln]	21.94	22.32	22.80	5.06	10.96	10.88	3.44	2.09	3.12	4.95
95th-Percentile Queue Length [ft/ln]	548.41	558.04	569.98	126.55	274.10	271.97	85.89	52.36	77.91	123.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	72.36	21.57	22.01	63.60	27.04	27.06	47.87	47.87	14.48	56.54	57.13	57.13
Movement LOS	E	C	C	E	C	C	D	D	B	E	E	E
d_A, Approach Delay [s/veh]	32.21			31.48			29.54			56.90		
Approach LOS	C			C			C			E		
d_I, Intersection Delay [s/veh]	33.11											
Intersection LOS	C											
Intersection V/C	0.678											

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	9.0	15.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	194.31	0.00	0.00	2383.30
d_p, Pedestrian Delay [s]	48.60	51.34	45.94	49.50
l_p,int, Pedestrian LOS Score for Intersection	2.983	2.750	2.303	2.077
Crosswalk LOS	C	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	867	633	367	225
d_b, Bicycle Delay [s]	19.36	28.02	40.28	47.45
l_b,int, Bicycle LOS Score for Intersection	3.201	2.144	1.947	1.801
Bicycle LOS	C	B	A	A

Sequence

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

Intersection Level Of Service Report
Intersection 2: Lava Dr / 17th Ave

Control Type:	Two-way stop	Delay (sec / veh):	20.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.212

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	50.00	100.00	100.00	100.00	100.00	65.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	63	416	205	113	55	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	5.00	3.00	6.00	4.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	416	205	113	55	27
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	116	57	31	15	8
Total Analysis Volume [veh/h]	70	462	228	126	61	30
Pedestrian Volume [ped/h]	0		1		2	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.21	0.04
d_M, Delay for Movement [s/veh]	8.15	0.00	0.00	0.00	20.88	10.07
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.18	0.00	0.00	0.00	0.79	0.13
95th-Percentile Queue Length [ft/ln]	4.59	0.00	0.00	0.00	19.68	3.16
d_A, Approach Delay [s/veh]	1.07		0.00		17.32	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.20					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 3: OR 224 / 17th Ave

Control Type:	Signalized	Delay (sec / veh):	24.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.751

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	160.00	100.00	130.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name						
Base Volume Input [veh/h]	433	53	336	232	93	514
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	11.00	1.00	6.00	5.00	5.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	433	53	336	232	93	514
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	116	14	90	62	25	138
Total Analysis Volume [veh/h]	466	57	361	249	100	553
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	22		18		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	14.00

Phasing & Timing

Control Type	Permissive	Permissive	ProtPerm	Permissive	Permissive	Overlap
Signal Group	6	0	5	2	4	4
Auxiliary Signal Groups						4,5
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	5
Maximum Green [s]	40	0	50	40	20	20
Amber [s]	4.0	0.0	3.5	4.0	4.0	4.0
All red [s]	0.5	0.0	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	2.0	2.5	2.5	2.5
Minimum Recall	Yes		No	Yes	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	3
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	17

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	104	104	104	104	104	104
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	0.00	2.50	2.50	0.00
g_i, Effective Green Time [s]	29	29	58	58	20	67
g / C, Green / Cycle	0.28	0.28	0.56	0.56	0.19	0.64
(v / s)_i Volume / Saturation Flow Rate	0.25	0.04	0.27	0.14	0.06	0.36
s, saturation flow rate [veh/h]	1840	1402	1321	1810	1738	1551
c, Capacity [veh/h]	508	387	621	1012	333	996
d1, Uniform Delay [s]	36.59	28.42	12.70	11.76	36.14	10.36
k, delay calibration	0.20	0.11	0.24	0.11	0.11	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.06	0.17	1.92	0.13	0.50	2.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.15	0.58	0.25	0.30	0.55
d, Delay for Lane Group [s/veh]	48.66	28.60	14.62	11.89	36.64	12.59
Lane Group LOS	D	C	B	B	D	B
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	12.98	1.09	4.80	2.89	2.22	7.03
50th-Percentile Queue Length [ft/ln]	324.48	27.25	120.06	72.29	55.54	175.75
95th-Percentile Queue Length [veh/ln]	18.89	1.96	8.40	5.21	4.00	11.38
95th-Percentile Queue Length [ft/ln]	472.19	49.05	209.91	130.13	99.97	284.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.66	28.60	14.62	11.89	36.64	12.59
Movement LOS	D	C	B	B	D	B
d_A, Approach Delay [s/veh]	46.47		13.51		16.27	
Approach LOS	D		B		B	
d_I, Intersection Delay [s/veh]	24.17					
Intersection LOS	C					
Intersection V/C	0.751					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.223	2.469	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	889	889	444
d_b, Bicycle Delay [s]	14.04	14.02	27.22
l_b,int, Bicycle LOS Score for Intersection	2.423	2.566	1.560
Bicycle LOS	B	B	A

Sequence

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

Intersection Level Of Service Report
Intersection 4: Waverly Ct / Lava Dr

Control Type:	Two-way stop	Delay (sec / veh):	8.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.036

Intersection Setup

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

Volumes

Name												
Base Volume Input [veh/h]	0	0	2	32	0	0	0	0	0	2	7	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	2	32	0	0	0	0	0	2	7	22
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	9	0	0	0	0	0	1	2	6
Total Analysis Volume [veh/h]	0	0	2	36	0	0	0	0	0	2	8	24
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.24	7.26	0.00	8.76	9.25	8.53	8.69	9.10	8.38	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.11	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	2.82	2.82	2.82	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00			8.76			8.72			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	4.38											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 1: OR 99W / Harrison St / 17th St

Control Type:	Signalized	Delay (sec / veh):	42.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.935

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	370.00	100.00	100.00	375.00	100.00	100.00	100.00	100.00	150.00	135.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	257	819	165	103	1674	13	28	79	475	212	48	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	4.00	4.00	1.00	2.00	2.00	0.00	6.00	1.00	2.00	9.00	6.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	8	0	0	0	0	0	238	0	0	22
Total Hourly Volume [veh/h]	257	819	157	103	1674	13	28	79	237	212	48	12
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	207	40	26	423	3	7	20	60	54	12	3
Total Analysis Volume [veh/h]	260	827	159	104	1691	13	28	80	239	214	48	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			0			12			0		
v_di, Inbound Pedestrian Volume crossing m	12			0			12			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			0			13			6		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	60.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Overlap	Split	Split	Split
Signal Group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	4	10	0	6	10	0	0	6	6	0	6	0
Maximum Green [s]	30	63	0	16	49	0	0	11	11	0	14	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	0.0	3.5	3.5	0.0	4.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0
Split [s]	23	60	0	19	56	0	0	26	26	0	15	0
Vehicle Extension [s]	2.3	6.1	0.0	2.3	6.1	0.0	0.0	2.3	2.3	0.0	2.3	0.0
Walk [s]	0	7	0	0	11	0	0	8	8	0	5	0
Pedestrian Clearance [s]	0	17	0	0	18	0	0	21	21	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.5	0.0
Minimum Recall	No	Yes		No	Yes			No	No		No	
Maximum Recall	No	No		No	No			No	No		No	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.50	2.50
g_i, Effective Green Time [s]	19	69	69	9	58	58	16	39	11	11
g / C, Green / Cycle	0.16	0.57	0.57	0.07	0.48	0.48	0.13	0.32	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.15	0.27	0.28	0.06	0.46	0.46	0.06	0.15	0.08	0.08
s, saturation flow rate [veh/h]	1781	1840	1724	1795	1870	1865	1787	1571	1781	1692
c, Capacity [veh/h]	284	1050	984	130	904	902	235	508	157	149
d1, Uniform Delay [s]	49.63	15.26	15.33	54.78	29.40	29.45	48.19	32.20	54.19	54.19
k, delay calibration	0.11	0.50	0.50	0.07	0.50	0.50	0.07	0.13	0.13	0.13
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.29	1.58	1.73	6.72	18.85	19.16	0.86	0.80	18.70	19.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.48	0.49	0.80	0.94	0.94	0.46	0.47	0.90	0.90
d, Delay for Lane Group [s/veh]	60.92	16.84	17.06	61.50	48.24	48.61	49.05	33.00	72.89	73.46
Lane Group LOS	E	B	B	E	D	D	D	C	E	E
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	8.55	8.43	8.07	3.34	27.14	27.23	3.05	5.63	5.02	4.78
50th-Percentile Queue Length [ft/ln]	213.72	210.73	201.72	83.48	678.62	680.80	76.30	140.83	125.39	119.56
95th-Percentile Queue Length [veh/ln]	13.34	13.19	12.73	6.01	35.69	35.79	5.49	9.53	8.69	8.37
95th-Percentile Queue Length [ft/ln]	333.59	329.76	318.19	150.26	892.23	894.76	137.33	238.14	217.22	209.22

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	60.92	16.93	17.06	61.50	48.42	48.61	49.05	49.05	33.00	73.09	73.46	73.46
Movement LOS	E	B	B	E	D	D	D	D	C	E	E	E
d_A, Approach Delay [s/veh]	26.12			49.18			38.00			73.17		
Approach LOS	C			D			D			E		
d_I, Intersection Delay [s/veh]	42.09											
Intersection LOS	D											
Intersection V/C	0.935											

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	9.0	15.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	196.35	0.00	0.00	3272.59
d_p, Pedestrian Delay [s]	48.60	51.34	45.94	49.50
l_p,int, Pedestrian LOS Score for Intersection	3.033	2.841	2.584	2.196
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	933	867	367	175
d_b, Bicycle Delay [s]	17.08	19.27	40.28	50.11
l_b,int, Bicycle LOS Score for Intersection	2.594	3.051	2.525	2.048
Bicycle LOS	B	C	B	B

Sequence

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

Intersection Level Of Service Report
Intersection 2: Lava Dr / 17th Ave

Control Type:	Two-way stop	Delay (sec / veh):	24.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.312

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	50.00	100.00	100.00	100.00	100.00	65.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	38	280	514	61	79	68
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	4.00	2.00	2.00	1.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	280	514	61	79	68
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	74	137	16	21	18
Total Analysis Volume [veh/h]	40	298	547	65	84	72
Pedestrian Volume [ped/h]	1		1		8	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.01	0.00	0.31	0.14
d_M, Delay for Movement [s/veh]	8.90	0.00	0.00	0.00	24.32	13.26
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.13	0.00	0.00	0.00	1.29	0.49
95th-Percentile Queue Length [ft/ln]	3.25	0.00	0.00	0.00	32.21	12.28
d_A, Approach Delay [s/veh]	1.05		0.00		19.21	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.03					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 3: OR 224 / 17th Ave

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.665

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	160.00	100.00	130.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name						
Base Volume Input [veh/h]	290	85	515	524	89	331
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	5.00	1.00	2.00	2.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	290	85	515	524	89	331
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	21	130	132	22	84
Total Analysis Volume [veh/h]	293	86	520	529	90	334
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	6		31		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Permissive	Permissive	ProtPerm	Permissive	Permissive	Overlap
Signal Group	6	0	5	2	4	4
Auxiliary Signal Groups						4,5
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	5
Maximum Green [s]	40	0	50	40	20	20
Amber [s]	4.0	0.0	3.5	4.0	4.0	4.0
All red [s]	0.5	0.0	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	2.0	2.5	2.5	2.5
Minimum Recall	Yes		No	Yes	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	3
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	17

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	71	71	71	71	71	71
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	0.00	2.50	2.50	0.00
g_i, Effective Green Time [s]	14	14	36	36	9	49
g / C, Green / Cycle	0.19	0.19	0.51	0.51	0.12	0.69
(v / s)_i Volume / Saturation Flow Rate	0.16	0.06	0.35	0.28	0.05	0.21
s, saturation flow rate [veh/h]	1855	1502	1477	1870	1781	1602
c, Capacity [veh/h]	358	290	747	956	222	1102
d1, Uniform Delay [s]	27.61	24.61	12.00	11.89	28.82	4.39
k, delay calibration	0.11	0.11	0.18	0.11	0.11	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.63	0.56	1.96	0.50	1.19	0.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.30	0.70	0.55	0.41	0.30
d, Delay for Lane Group [s/veh]	32.24	25.18	13.97	12.39	30.01	4.73
Lane Group LOS	C	C	B	B	C	A
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.02	1.24	5.38	5.15	1.44	1.49
50th-Percentile Queue Length [ft/ln]	125.45	30.95	134.59	128.72	36.08	37.28
95th-Percentile Queue Length [veh/ln]	8.69	2.23	9.19	8.87	2.60	2.68
95th-Percentile Queue Length [ft/ln]	217.29	55.71	229.72	221.76	64.95	67.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.24	25.18	13.97	12.39	30.01	4.73
Movement LOS	C	C	B	B	C	A
d_A, Approach Delay [s/veh]	30.64		13.17		10.09	
Approach LOS	C		B		B	
d_I, Intersection Delay [s/veh]	16.04					
Intersection LOS	B					
Intersection V/C	0.665					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.264	2.484	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	889	889	444
d_b, Bicycle Delay [s]	13.93	14.11	27.22
I_b,int, Bicycle LOS Score for Intersection	2.185	3.290	1.560
Bicycle LOS	B	C	A

Sequence

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

Intersection Level Of Service Report
Intersection 4: Waverly Ct / Lava Dr

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.010

Intersection Setup

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

Volumes

Name												
Base Volume Input [veh/h]	0	0	2	24	0	0	0	8	0	2	11	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	2	24	0	0	0	8	0	2	11	33
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	6	0	0	0	2	0	1	3	9
Total Analysis Volume [veh/h]	0	0	2	26	0	0	0	9	0	2	12	35
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

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

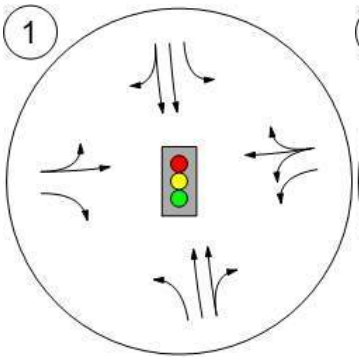
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.26	7.29	0.00	8.83	9.31	8.53	8.81	9.18	8.45	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.08	0.08	0.08	0.03	0.03	0.03	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	2.07	2.07	2.07	0.78	0.78	0.78	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00			8.83			9.18			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.63											
Intersection LOS	A											

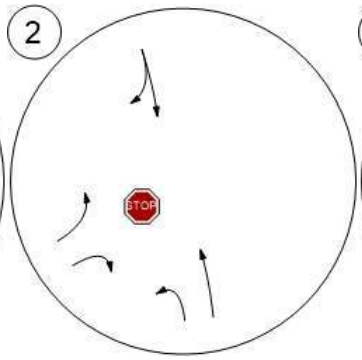
Attachment E – 2021 Background Traffic Level-of-Service Worksheets

Lane Configuration and Traffic Control

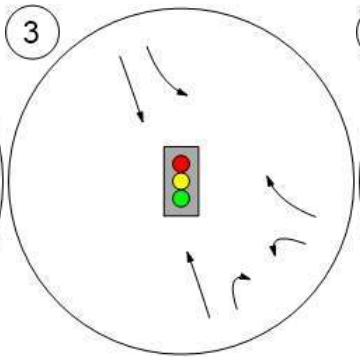
OR 99W / Harrison St / 17th



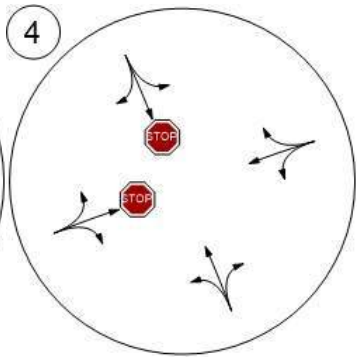
Lava Dr / 17th Ave



OR 224 / 17th Ave

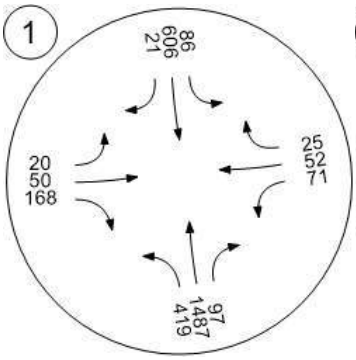


Waverly Ct / Lava Dr

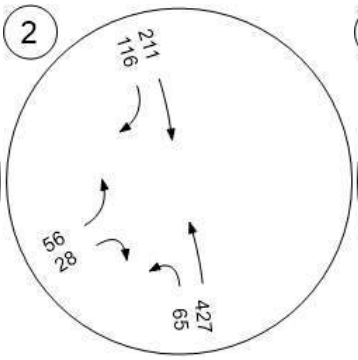


Traffic Volume

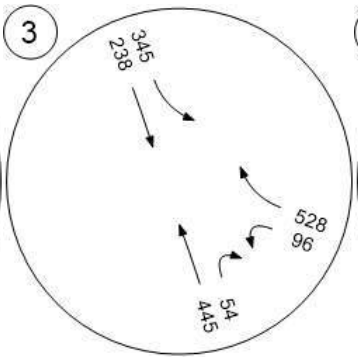
OR 99W / Harrison St / 17th



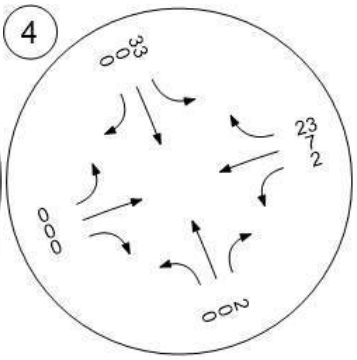
Lava Dr / 17th Ave



OR 224 / 17th Ave

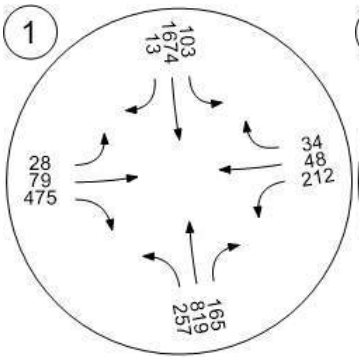


Waverly Ct / Lava Dr

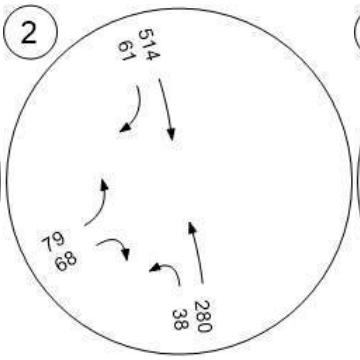


Traffic Volume

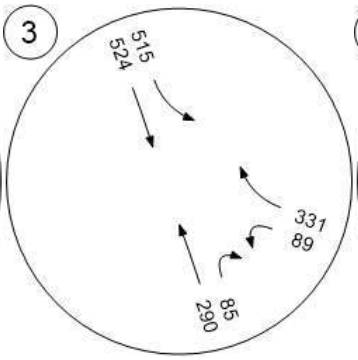
OR 99W / Harrison St / 17th



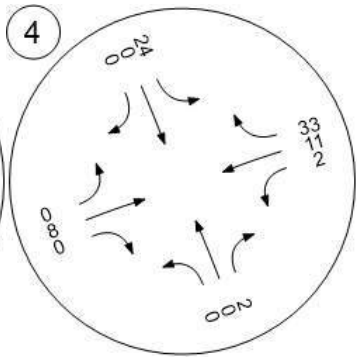
Lava Dr / 17th Ave



OR 224 / 17th Ave



Waverly Ct / Lava Dr



Intersection Level Of Service Report
Intersection 1: OR 99W / Harrison St / 17th St

Control Type:	Signalized	Delay (sec / veh):	37.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.719

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	370.00	100.00	100.00	375.00	100.00	100.00	100.00	100.00	150.00	135.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	408	1448	94	84	590	20	19	49	164	69	51	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	4.00	5.00	11.00	7.00	2.00	6.00	10.00	4.00	7.00	11.00	5.00
Growth Factor	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	84	0	0	0
Total Hourly Volume [veh/h]	419	1487	97	86	606	21	20	50	84	71	52	25
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	110	391	26	23	159	5	5	13	22	19	14	7
Total Analysis Volume [veh/h]	441	1565	102	91	638	21	21	53	88	75	55	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	15			0			15			0		
v_di, Inbound Pedestrian Volume crossing m	15			0			15			0		
v_co, Outbound Pedestrian Volume crossing	1			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	10			0			13			8		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	93.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Overlap	Split	Split	Split
Signal Group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lag	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	4	10	0	6	10	0	0	6	6	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	0.0	3.5	3.5	0.0	4.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0
Split [s]	34	56	0	20	42	0	0	26	26	0	18	0
Vehicle Extension [s]	2.3	6.1	0.0	2.3	6.1	0.0	0.0	2.3	2.3	0.0	2.3	0.0
Walk [s]	0	7	0	0	11	0	0	8	8	0	5	0
Pedestrian Clearance [s]	0	17	0	0	18	0	0	21	21	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.5	0.0
Minimum Recall	No	Yes		No	Yes			No	No		No	
Maximum Recall	No	No		No	No			No	No		No	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.50	2.50
g_i, Effective Green Time [s]	30	70	70	8	49	49	16	63	9	9
g / C, Green / Cycle	0.25	0.59	0.59	0.07	0.41	0.41	0.13	0.53	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.25	0.45	0.46	0.06	0.18	0.18	0.04	0.06	0.04	0.06
s, saturation flow rate [veh/h]	1752	1840	1794	1652	1795	1775	1725	1549	1360	1580
c, Capacity [veh/h]	438	1078	1051	113	726	718	226	820	150	156
d1, Uniform Delay [s]	45.03	18.82	19.23	55.11	26.09	26.10	47.36	14.13	54.76	54.39
k, delay calibration	0.45	0.50	0.50	0.07	0.50	0.50	0.07	0.07	0.07	0.07
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	42.67	5.40	6.16	7.83	2.06	2.09	0.51	0.03	1.06	2.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.01	0.77	0.79	0.80	0.46	0.46	0.33	0.11	0.40	0.61
d, Delay for Lane Group [s/veh]	87.71	24.22	25.39	62.94	28.15	28.18	47.87	14.16	55.82	56.75
Lane Group LOS	F	C	C	E	C	C	D	B	E	E
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	18.10	18.22	18.76	2.96	7.30	7.23	2.05	1.21	1.83	2.94
50th-Percentile Queue Length [ft/ln]	452.61	455.51	469.02	74.01	182.55	180.75	51.23	30.14	45.83	73.46
95th-Percentile Queue Length [veh/ln]	25.19	25.22	25.86	5.33	11.73	11.64	3.69	2.17	3.30	5.29
95th-Percentile Queue Length [ft/ln]	629.82	630.52	646.61	133.22	293.34	291.00	92.22	54.25	82.50	132.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	87.71	24.77	25.39	62.94	28.17	28.18	47.87	47.87	14.16	55.82	56.75	56.75
Movement LOS	F	C	C	E	C	C	D	D	B	E	E	E
d_A, Approach Delay [s/veh]	37.96			32.39			29.56			56.39		
Approach LOS	D			C			C			E		
d_I, Intersection Delay [s/veh]	37.12											
Intersection LOS	D											
Intersection V/C	0.719											

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	9.0	15.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	188.94	0.00	0.00	2312.16
d_p, Pedestrian Delay [s]	48.60	51.34	45.94	49.50
l_p,int, Pedestrian LOS Score for Intersection	3.024	2.776	2.318	2.085
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	867	633	367	225
d_b, Bicycle Delay [s]	19.36	28.02	40.28	47.45
l_b,int, Bicycle LOS Score for Intersection	3.299	2.178	1.966	1.817
Bicycle LOS	C	B	A	A

Sequence

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

Intersection Level Of Service Report
Intersection 2: Lava Dr / 17th Ave

Control Type:	Two-way stop	Delay (sec / veh):	21.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.223

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	50.00	100.00	100.00	100.00	100.00	65.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	63	416	205	113	55	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	5.00	3.00	6.00	4.00
Growth Factor	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	427	211	116	56	28
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	119	59	32	16	8
Total Analysis Volume [veh/h]	72	474	234	129	62	31
Pedestrian Volume [ped/h]	0		1		2	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.22	0.04
d_M, Delay for Movement [s/veh]	8.18	0.00	0.00	0.00	21.67	10.13
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.19	0.00	0.00	0.00	0.84	0.13
95th-Percentile Queue Length [ft/ln]	4.77	0.00	0.00	0.00	20.93	3.31
d_A, Approach Delay [s/veh]	1.08		0.00		17.82	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.24					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 3: OR 224 / 17th Ave

Control Type:	Signalized	Delay (sec / veh):	26.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.772

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	160.00	100.00	130.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name						
Base Volume Input [veh/h]	433	53	336	232	93	514
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	11.00	1.00	6.00	5.00	5.00
Growth Factor	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	445	54	345	238	96	528
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	122	15	95	65	26	145
Total Analysis Volume [veh/h]	489	59	379	262	105	580
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	22		18		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	14.00

Phasing & Timing

Control Type	Permissive	Permissive	ProtPerm	Permissive	Permissive	Overlap
Signal Group	6	0	5	2	4	4
Auxiliary Signal Groups						4,5
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	5
Maximum Green [s]	40	0	50	40	20	20
Amber [s]	4.0	0.0	3.5	4.0	4.0	4.0
All red [s]	0.5	0.0	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	2.0	2.5	2.5	2.5
Minimum Recall	Yes		No	Yes	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	3
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	17

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	111	111	111	111	111	111
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	0.00	2.50	2.50	0.00
g_i, Effective Green Time [s]	32	32	65	65	20	70
g / C, Green / Cycle	0.29	0.29	0.58	0.58	0.18	0.64
(v / s)_i Volume / Saturation Flow Rate	0.27	0.04	0.29	0.14	0.06	0.37
s, saturation flow rate [veh/h]	1840	1403	1317	1810	1738	1551
c, Capacity [veh/h]	527	402	641	1058	314	988
d1, Uniform Delay [s]	38.38	29.36	12.11	11.17	39.56	11.67
k, delay calibration	0.26	0.11	0.30	0.11	0.11	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	15.37	0.17	2.44	0.12	0.62	2.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.93	0.15	0.59	0.25	0.33	0.59
d, Delay for Lane Group [s/veh]	53.75	29.52	14.55	11.29	40.18	14.23
Lane Group LOS	D	C	B	B	D	B
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	14.93	1.19	5.19	3.07	2.55	8.37
50th-Percentile Queue Length [ft/ln]	373.36	29.73	129.68	76.66	63.63	209.28
95th-Percentile Queue Length [veh/ln]	21.27	2.14	8.92	5.52	4.58	13.12
95th-Percentile Queue Length [ft/ln]	531.80	53.51	223.06	137.99	114.54	327.91

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.75	29.52	14.55	11.29	40.18	14.23
Movement LOS	D	C	B	B	D	B
d_A, Approach Delay [s/veh]	51.14		13.22		18.21	
Approach LOS	D		B		B	
d_I, Intersection Delay [s/veh]	26.13					
Intersection LOS	C					
Intersection V/C	0.772					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.237	2.495	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	889	889	444
d_b, Bicycle Delay [s]	14.04	14.02	27.22
l_b,int, Bicycle LOS Score for Intersection	2.464	2.617	1.560
Bicycle LOS	B	B	A

Sequence

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

Intersection Level Of Service Report
Intersection 4: Waverly Ct / Lava Dr

Control Type:	Two-way stop	Delay (sec / veh):	8.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.037

Intersection Setup

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

Volumes

Name												
Base Volume Input [veh/h]	0	0	2	32	0	0	0	0	0	2	7	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	2	33	0	0	0	0	0	2	7	23
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	9	0	0	0	0	0	1	2	6
Total Analysis Volume [veh/h]	0	0	2	37	0	0	0	0	0	2	8	26
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.24	7.27	0.00	8.77	9.26	8.53	8.70	9.11	8.38	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	2.91	2.91	2.91	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00			8.77			8.73			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	4.33											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 1: OR 99W / Harrison St / 17th St

Control Type:	Signalized	Delay (sec / veh):	41.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.935

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	370.00	100.00	100.00	375.00	100.00	100.00	100.00	100.00	150.00	135.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	257	819	165	103	1674	13	28	79	475	212	48	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	4.00	4.00	1.00	2.00	2.00	0.00	6.00	1.00	2.00	9.00	6.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	9	0	0	1	0	0	238	0	0	21
Total Hourly Volume [veh/h]	257	819	156	103	1674	12	28	79	237	212	48	13
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	207	39	26	423	3	7	20	60	54	12	3
Total Analysis Volume [veh/h]	260	827	158	104	1691	12	28	80	239	214	48	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			0			12			0		
v_di, Inbound Pedestrian Volume crossing m	12			0			12			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			0			13			6		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	60.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Overlap	Split	Split	Split
Signal Group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	4	10	0	6	10	0	0	6	6	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	0.0	3.5	3.5	0.0	4.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0
Split [s]	23	60	0	19	56	0	0	26	26	0	15	0
Vehicle Extension [s]	2.3	6.1	0.0	2.3	6.1	0.0	0.0	2.3	2.3	0.0	2.3	0.0
Walk [s]	0	7	0	0	11	0	0	8	8	0	5	0
Pedestrian Clearance [s]	0	17	0	0	18	0	0	21	21	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.5	0.0
Minimum Recall	No	Yes		No	Yes			No	No		No	
Maximum Recall	No	No		No	No			No	No		No	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.50	2.50
g_i, Effective Green Time [s]	19	68	68	9	58	58	16	39	11	11
g / C, Green / Cycle	0.16	0.57	0.57	0.07	0.48	0.48	0.13	0.32	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.15	0.27	0.28	0.06	0.46	0.46	0.06	0.15	0.08	0.08
s, saturation flow rate [veh/h]	1781	1840	1725	1795	1870	1865	1787	1571	1781	1690
c, Capacity [veh/h]	283	1047	982	131	904	902	235	508	158	150
d1, Uniform Delay [s]	49.76	15.38	15.45	54.78	29.45	29.49	48.19	32.27	54.18	54.17
k, delay calibration	0.11	0.50	0.50	0.07	0.50	0.50	0.07	0.13	0.07	0.07
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.74	1.59	1.74	6.46	18.87	19.16	0.85	0.80	10.41	10.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.48	0.49	0.79	0.94	0.94	0.46	0.47	0.89	0.89
d, Delay for Lane Group [s/veh]	61.50	16.97	17.19	61.23	48.31	48.65	49.04	33.07	64.58	64.98
Lane Group LOS	E	B	B	E	D	D	D	C	E	E
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	8.59	8.44	8.08	3.33	27.14	27.23	3.05	5.64	4.68	4.45
50th-Percentile Queue Length [ft/ln]	214.70	211.05	202.07	83.30	678.62	680.63	76.31	140.95	116.94	111.27
95th-Percentile Queue Length [veh/ln]	13.39	13.21	12.75	6.00	35.69	35.78	5.49	9.53	8.22	7.91
95th-Percentile Queue Length [ft/ln]	334.85	330.17	318.63	149.94	892.23	894.55	137.35	238.30	205.61	197.77

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	61.50	17.05	17.19	61.23	48.48	48.65	49.04	49.04	33.07	64.72	64.98	64.98
Movement LOS	E	B	B	E	D	D	D	D	C	E	E	E
d_A, Approach Delay [s/veh]	26.35			49.22			38.04			64.78		
Approach LOS	C			D			D			E		
d_I, Intersection Delay [s/veh]	41.58											
Intersection LOS	D											
Intersection V/C	0.935											

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	9.0	15.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	196.35	0.00	0.00	3296.31
d_p, Pedestrian Delay [s]	48.60	51.34	45.94	49.50
l_p,int, Pedestrian LOS Score for Intersection	3.035	2.842	2.584	2.194
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	933	867	367	175
d_b, Bicycle Delay [s]	17.08	19.27	40.28	50.11
l_b,int, Bicycle LOS Score for Intersection	2.594	3.051	2.525	2.048
Bicycle LOS	B	C	B	B

Sequence

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

Intersection Level Of Service Report
Intersection 2: Lava Dr / 17th Ave

Control Type:	Two-way stop	Delay (sec / veh):	24.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.312

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	50.00	100.00	100.00	100.00	100.00	65.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	38	280	514	61	79	68
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	4.00	2.00	2.00	1.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	280	514	61	79	68
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	74	137	16	21	18
Total Analysis Volume [veh/h]	40	298	547	65	84	72
Pedestrian Volume [ped/h]	1		1		8	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.01	0.00	0.31	0.14
d_M, Delay for Movement [s/veh]	8.90	0.00	0.00	0.00	24.32	13.26
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.13	0.00	0.00	0.00	1.29	0.49
95th-Percentile Queue Length [ft/ln]	3.25	0.00	0.00	0.00	32.21	12.28
d_A, Approach Delay [s/veh]	1.05		0.00		19.21	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.03					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 3: OR 224 / 17th Ave

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.665

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	160.00	100.00	130.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name						
Base Volume Input [veh/h]	290	85	515	524	89	331
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	5.00	1.00	2.00	2.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	290	85	515	524	89	331
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	21	130	132	22	84
Total Analysis Volume [veh/h]	293	86	520	529	90	334
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	6		31		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Permissive	Permissive	ProtPerm	Permissive	Permissive	Overlap
Signal Group	6	0	5	2	4	4
Auxiliary Signal Groups						4,5
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	5
Maximum Green [s]	40	0	50	40	20	20
Amber [s]	4.0	0.0	3.5	4.0	4.0	4.0
All red [s]	0.5	0.0	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	2.0	2.5	2.5	2.5
Minimum Recall	Yes		No	Yes	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	3
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	17

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	71	71	71	71	71	71
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	0.00	2.50	2.50	0.00
g_i, Effective Green Time [s]	14	14	36	36	9	49
g / C, Green / Cycle	0.19	0.19	0.51	0.51	0.12	0.69
(v / s)_i Volume / Saturation Flow Rate	0.16	0.06	0.35	0.28	0.05	0.21
s, saturation flow rate [veh/h]	1855	1502	1477	1870	1781	1602
c, Capacity [veh/h]	358	290	747	956	222	1102
d1, Uniform Delay [s]	27.61	24.61	12.00	11.89	28.82	4.39
k, delay calibration	0.11	0.11	0.18	0.11	0.11	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.63	0.56	1.96	0.50	1.19	0.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.30	0.70	0.55	0.41	0.30
d, Delay for Lane Group [s/veh]	32.24	25.18	13.97	12.39	30.01	4.73
Lane Group LOS	C	C	B	B	C	A
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.02	1.24	5.38	5.15	1.44	1.49
50th-Percentile Queue Length [ft/ln]	125.45	30.95	134.59	128.72	36.08	37.28
95th-Percentile Queue Length [veh/ln]	8.69	2.23	9.19	8.87	2.60	2.68
95th-Percentile Queue Length [ft/ln]	217.29	55.71	229.72	221.76	64.95	67.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.24	25.18	13.97	12.39	30.01	4.73
Movement LOS	C	C	B	B	C	A
d_A, Approach Delay [s/veh]	30.64		13.17		10.09	
Approach LOS	C		B		B	
d_I, Intersection Delay [s/veh]	16.04					
Intersection LOS	B					
Intersection V/C	0.665					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.264	2.484	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	889	889	444
d_b, Bicycle Delay [s]	13.93	14.11	27.22
l_b,int, Bicycle LOS Score for Intersection	2.185	3.290	1.560
Bicycle LOS	B	C	A

Sequence

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

Intersection Level Of Service Report
Intersection 4: Waverly Ct / Lava Dr

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.010

Intersection Setup

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

Volumes

Name												
Base Volume Input [veh/h]	0	0	2	24	0	0	0	8	0	2	11	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	2	24	0	0	0	8	0	2	11	33
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	6	0	0	0	2	0	1	3	9
Total Analysis Volume [veh/h]	0	0	2	26	0	0	0	9	0	2	12	35
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

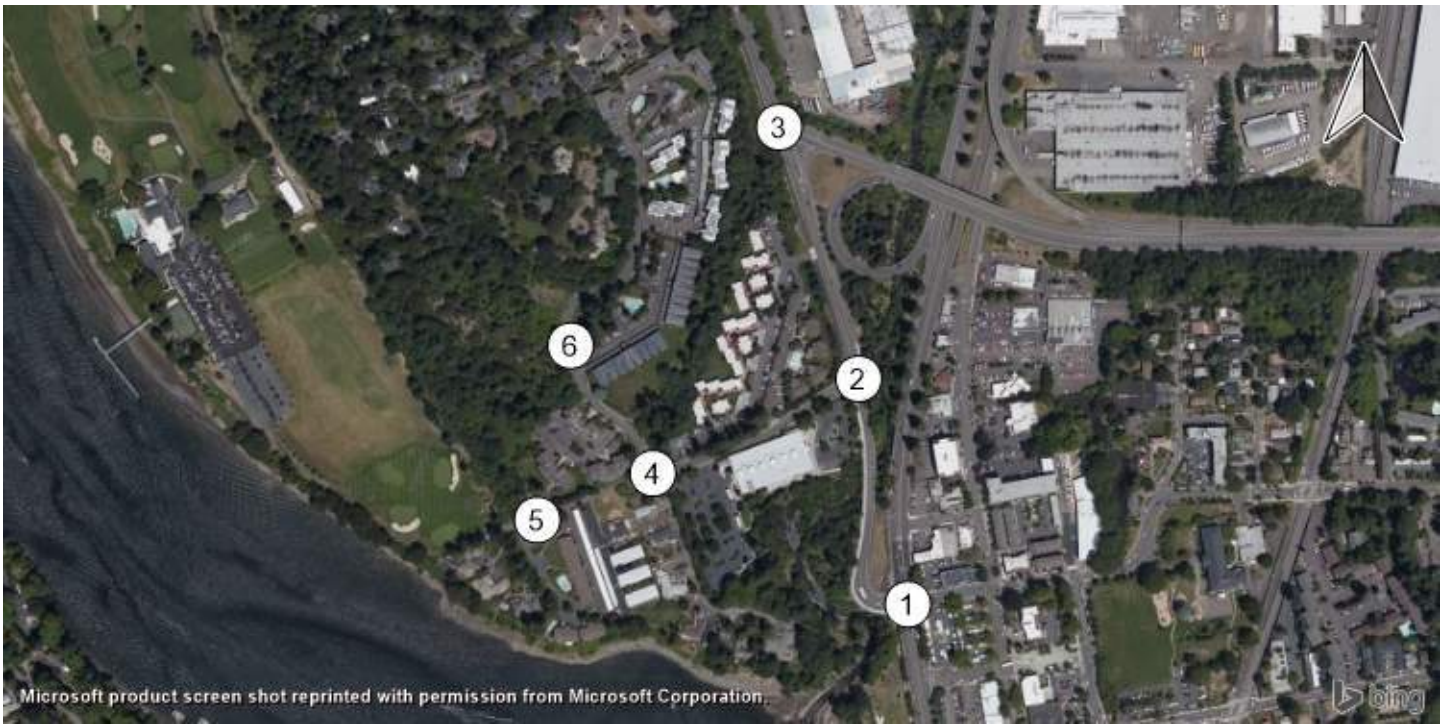
Priority Scheme	Free	Stop	Stop	Free
Flared Lane		No	No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance		No	No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

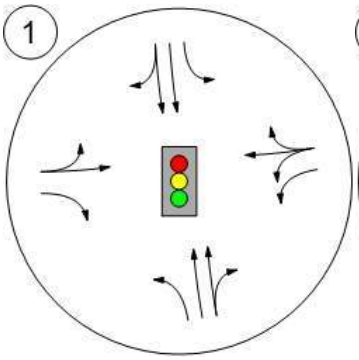
V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.26	7.29	0.00	8.83	9.31	8.53	8.81	9.18	8.45	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.08	0.08	0.08	0.03	0.03	0.03	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	2.07	2.07	2.07	0.78	0.78	0.78	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00			8.83			9.18			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.63											
Intersection LOS	A											

Attachment F – 2021 Total Traffic Level-of-Service Worksheets

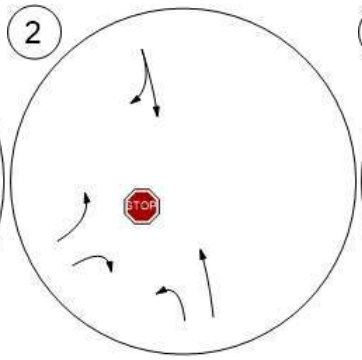
Lane Configuration and Traffic Control



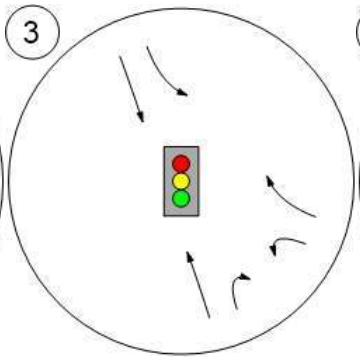
OR 99W / Harrison St / 17th



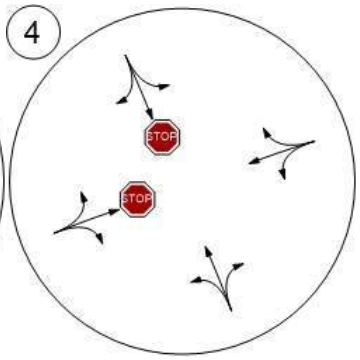
Lava Dr / 17th Ave



OR 224 / 17th Ave



Waverly Ct / Lava Dr



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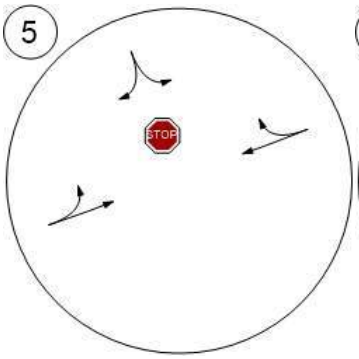
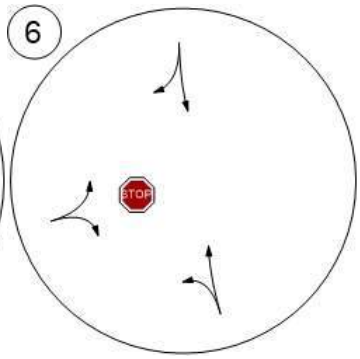
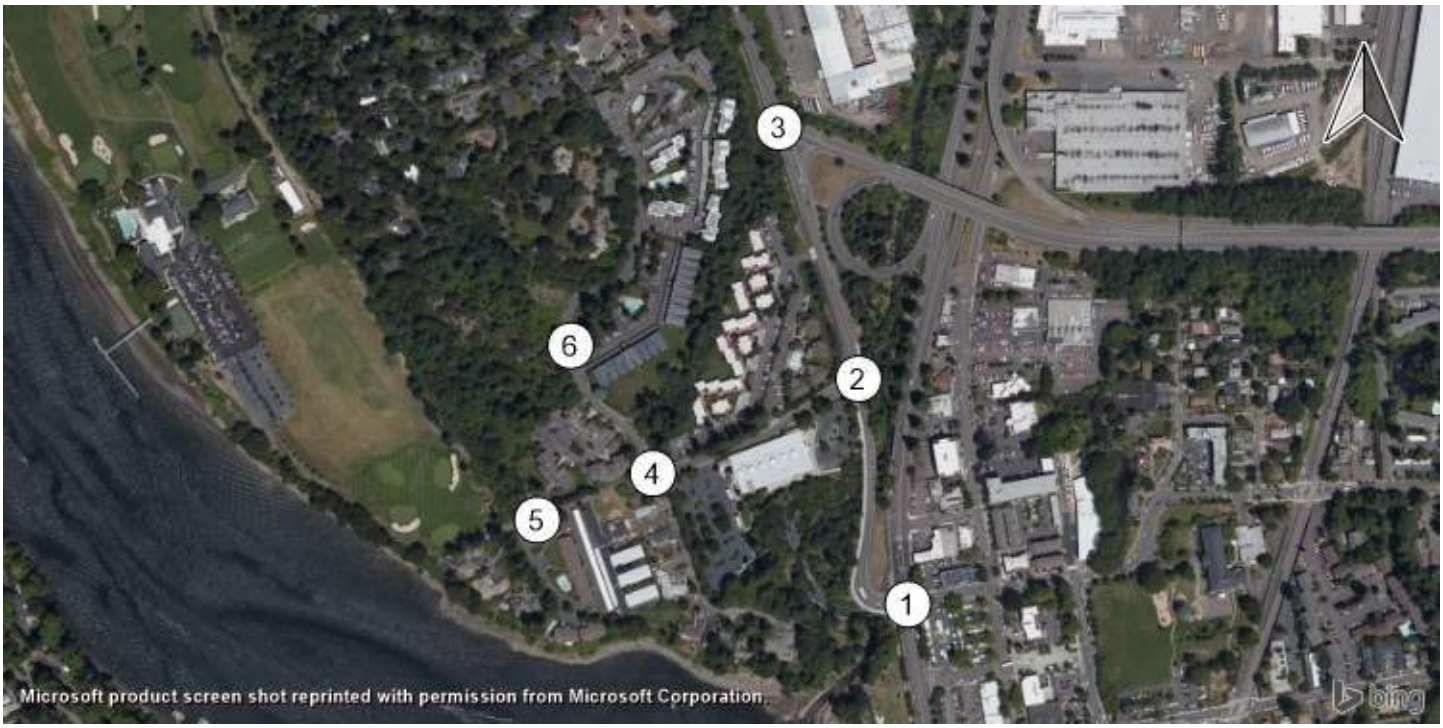


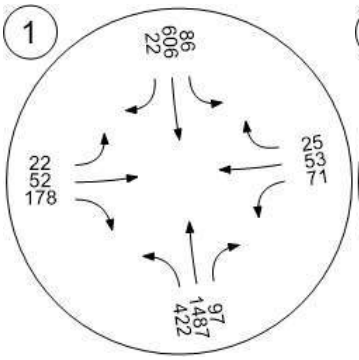
Waverly Ct / Site Access Nort



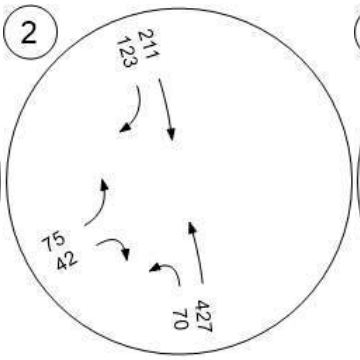
Traffic Volume



OR 99W / Harrison St / 17th



Lava Dr / 17th Ave



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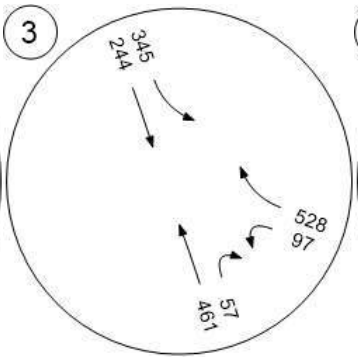
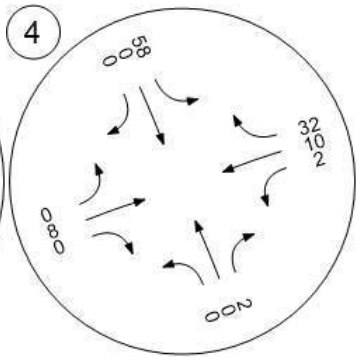


Waverly Ct / Lava Dr



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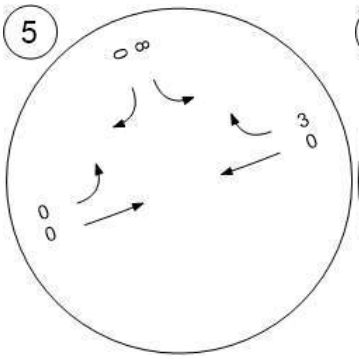
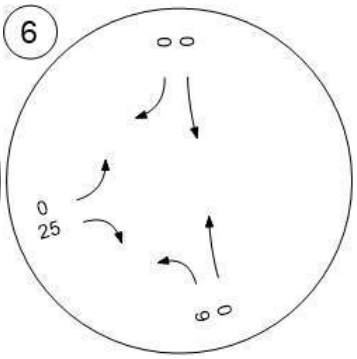
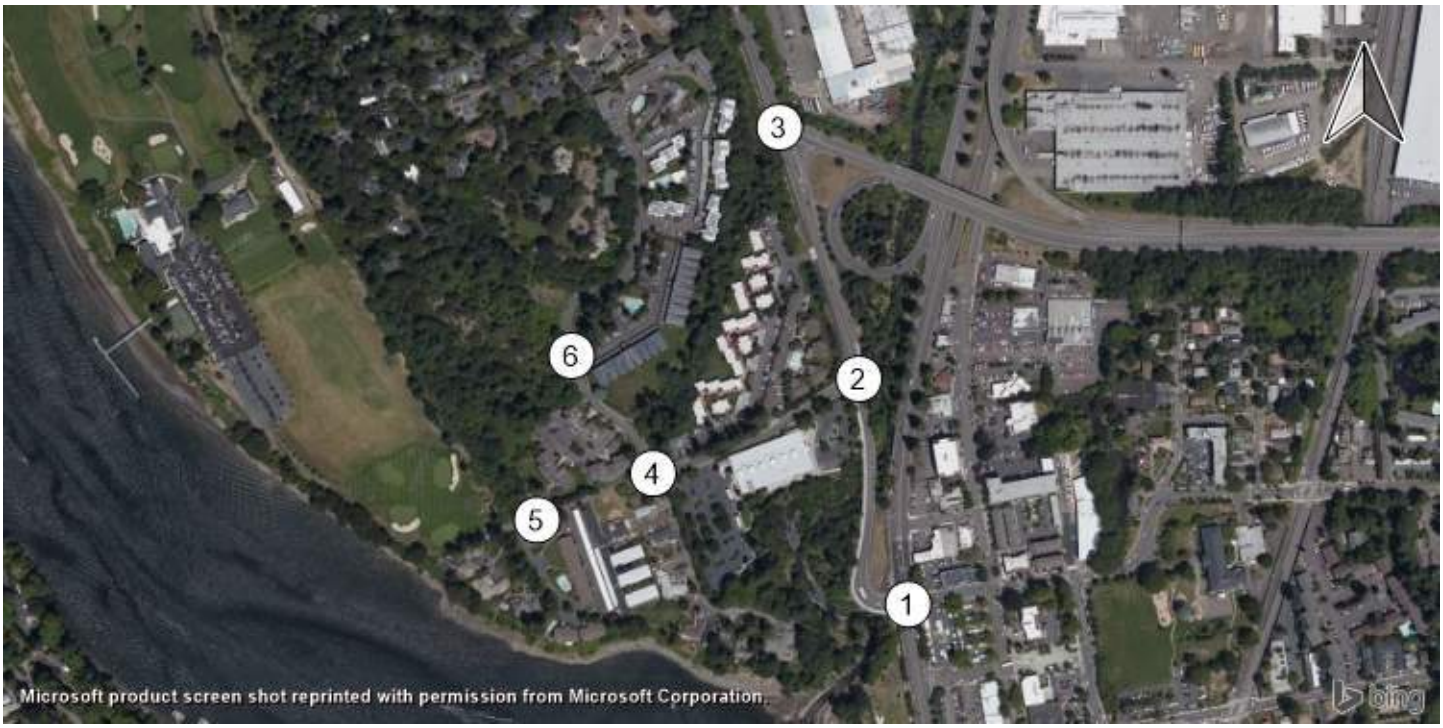


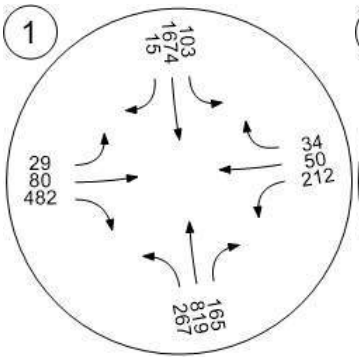
Waverly Ct / Site Access Nort



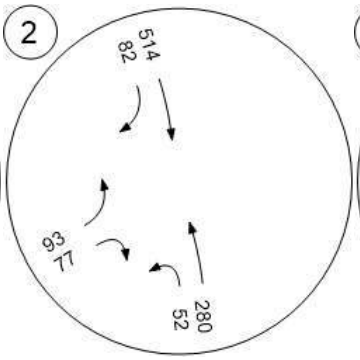
Traffic Volume



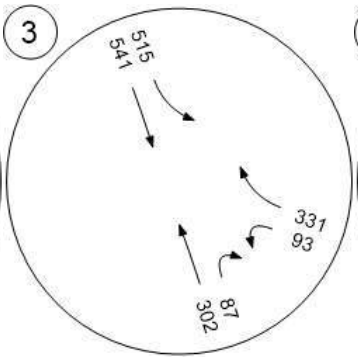
OR 99W / Harrison St / 17th



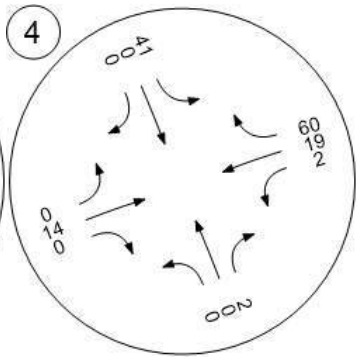
Lava Dr / 17th Ave



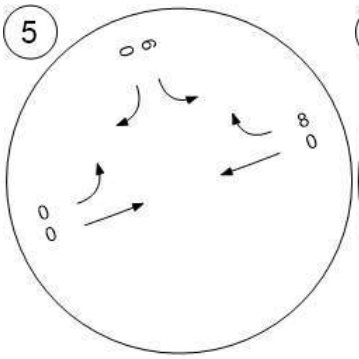
OR 224 / 17th Ave



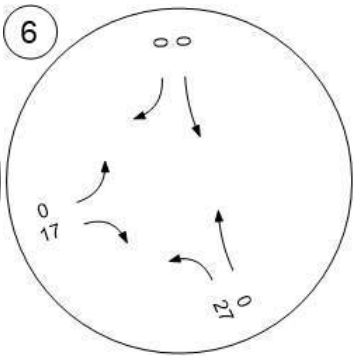
Waverly Ct / Lava Dr



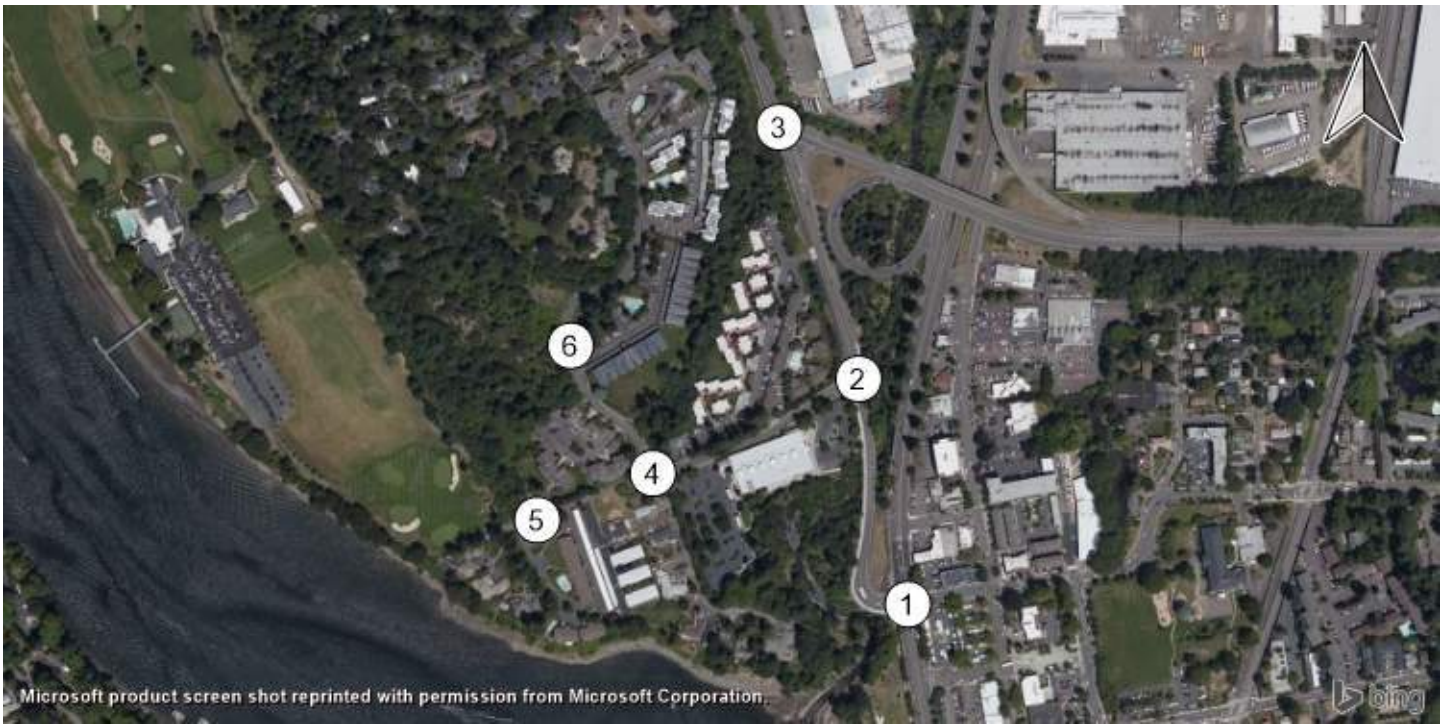
/ Site Access Sou



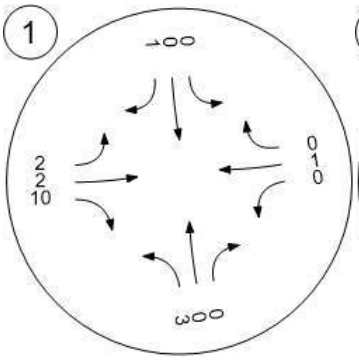
Waverly Ct / Site Access Nort



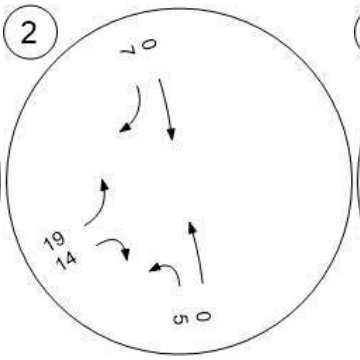
Traffic Volume - Net New Site Trips



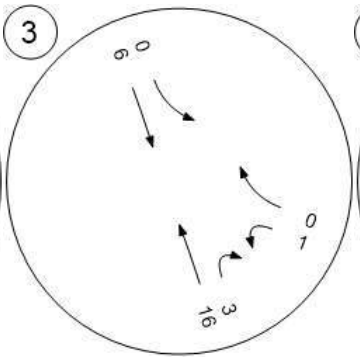
OR 99W / Harrison St / 17th



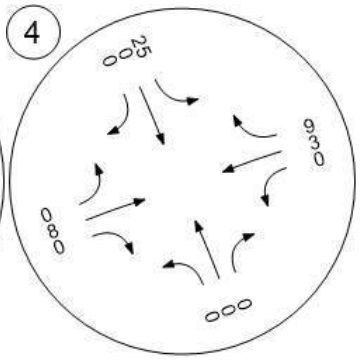
Lava Dr / 17th Ave



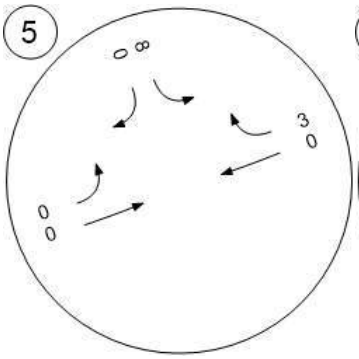
OR 224 / 17th Ave



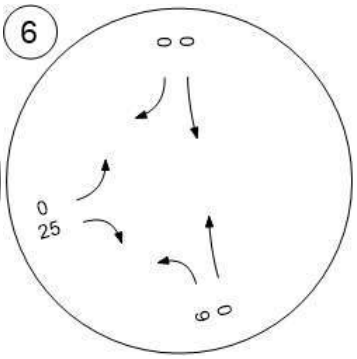
Waverly Ct / Lava Dr



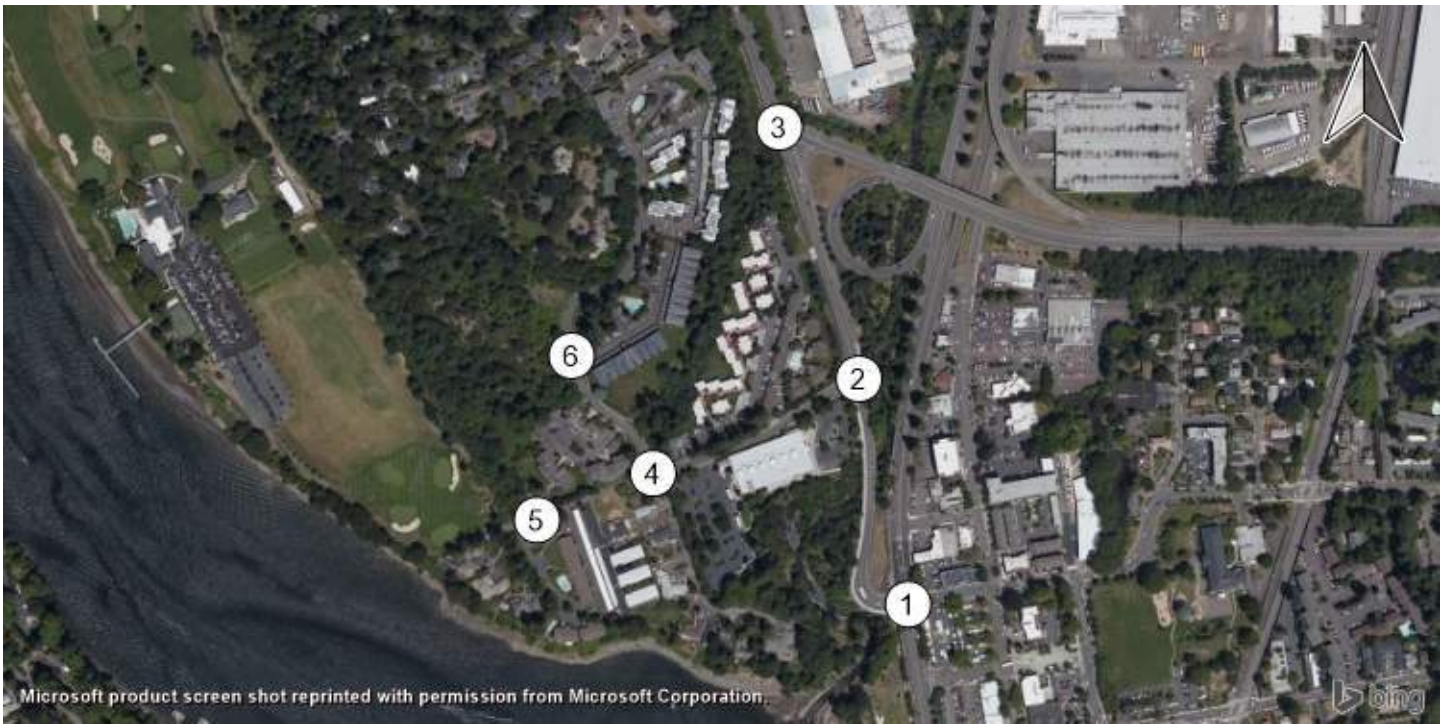
Waverly Ct / SIte Access Sou



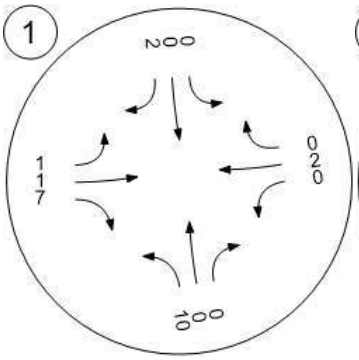
Waverly Ct / Site Access Nort



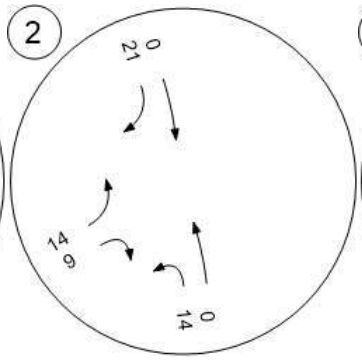
Traffic Volume - Net New Site Trips



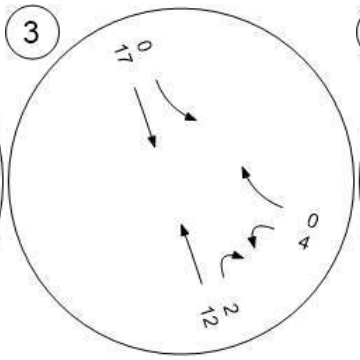
OR 99W / Harrison St / 17th



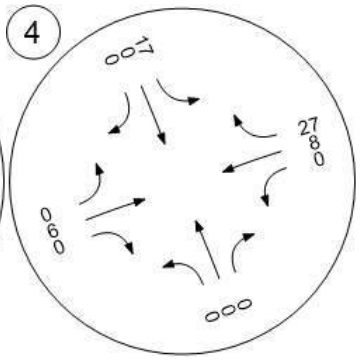
Lava Dr / 17th Ave



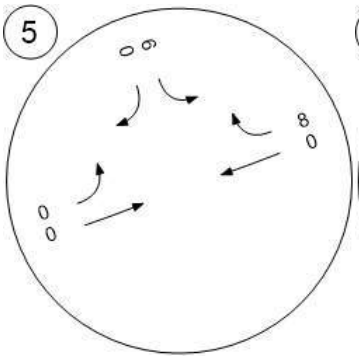
OR 224 / 17th Ave



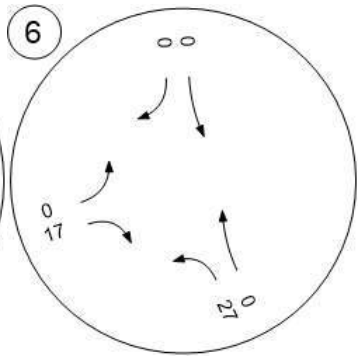
Waverly Ct / Lava Dr



Waverly Ct / Site Access Sou



Waverly Ct / Site Access Nort



Intersection Level Of Service Report
Intersection 1: OR 99W / Harrison St / 17th St

Control Type:	Signalized	Delay (sec / veh):	37.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.723

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	370.00	100.00	100.00	375.00	100.00	100.00	100.00	100.00	150.00	135.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	408	1448	94	84	590	20	19	49	164	69	51	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	4.00	5.00	11.00	7.00	2.00	6.00	10.00	4.00	7.00	11.00	5.00
Growth Factor	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	1	2	2	10	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	89	0	0	0
Total Hourly Volume [veh/h]	422	1487	97	86	606	22	22	52	89	71	53	25
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	111	391	26	23	159	6	6	14	23	19	14	7
Total Analysis Volume [veh/h]	444	1565	102	91	638	22	23	55	94	75	56	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	15			0			15			0		
v_di, Inbound Pedestrian Volume crossing m	15			0			15			0		
v_co, Outbound Pedestrian Volume crossing	1			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	10			0			13			8		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	93.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Overlap	Split	Split	Split
Signal Group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lag	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	4	10	0	6	10	0	0	6	6	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	0.0	3.5	3.5	0.0	4.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0
Split [s]	34	56	0	20	42	0	0	26	26	0	18	0
Vehicle Extension [s]	2.3	6.1	0.0	2.3	6.1	0.0	0.0	2.3	2.3	0.0	2.3	0.0
Walk [s]	0	7	0	0	11	0	0	8	8	0	5	0
Pedestrian Clearance [s]	0	17	0	0	18	0	0	21	21	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.5	0.0
Minimum Recall	No	Yes		No	Yes			No	No		No	
Maximum Recall	No	No		No	No			No	No		No	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.50	2.50
g_i, Effective Green Time [s]	30	70	70	8	48	48	16	64	9	9
g / C, Green / Cycle	0.25	0.58	0.58	0.07	0.40	0.40	0.13	0.53	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.25	0.45	0.46	0.06	0.18	0.18	0.05	0.06	0.04	0.06
s, saturation flow rate [veh/h]	1752	1840	1794	1652	1795	1774	1724	1549	1360	1575
c, Capacity [veh/h]	438	1075	1048	113	723	715	228	823	151	157
d1, Uniform Delay [s]	45.03	18.99	19.40	55.11	26.27	26.27	47.32	14.07	54.70	54.38
k, delay calibration	0.46	0.50	0.50	0.07	0.50	0.50	0.07	0.07	0.07	0.07
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	44.70	5.49	6.26	7.83	2.09	2.12	0.54	0.04	1.05	2.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.01	0.78	0.80	0.80	0.46	0.46	0.34	0.11	0.40	0.62
d, Delay for Lane Group [s/veh]	89.73	24.48	25.67	62.94	28.36	28.39	47.86	14.11	55.74	56.79
Lane Group LOS	F	C	C	E	C	C	D	B	E	E
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	18.35	18.35	18.90	2.96	7.35	7.27	2.16	1.29	1.83	2.97
50th-Percentile Queue Length [ft/ln]	458.76	458.71	472.38	74.01	183.75	181.87	54.05	32.15	45.76	74.29
95th-Percentile Queue Length [veh/ln]	25.59	25.37	26.02	5.33	11.80	11.70	3.89	2.31	3.29	5.35
95th-Percentile Queue Length [ft/ln]	639.82	634.33	650.60	133.22	294.91	292.45	97.28	57.87	82.37	133.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	89.73	25.04	25.67	62.94	28.38	28.39	47.86	47.86	14.11	55.74	56.79	56.79
Movement LOS	F	C	C	E	C	C	D	D	B	E	E	E
d_A, Approach Delay [s/veh]	38.67			32.57			29.42			56.39		
Approach LOS	D			C			C			E		
d_I, Intersection Delay [s/veh]	37.61											
Intersection LOS	D											
Intersection V/C	0.723											

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	9.0	15.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	185.80	0.00	0.00	2312.16
d_p, Pedestrian Delay [s]	48.60	51.34	45.94	49.50
l_p,int, Pedestrian LOS Score for Intersection	3.027	2.776	2.332	2.086
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	867	633	367	225
d_b, Bicycle Delay [s]	19.36	28.02	40.28	47.45
l_b,int, Bicycle LOS Score for Intersection	3.301	2.179	1.990	1.819
Bicycle LOS	C	B	A	A

Sequence

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

Intersection Level Of Service Report
Intersection 2: Lava Dr / 17th Ave

Control Type:	Two-way stop	Delay (sec / veh):	24.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.308

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	50.00	100.00	100.00	100.00	100.00	65.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	63	416	205	113	55	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	5.00	3.00	6.00	4.00
Growth Factor	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	0	0	7	19	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	427	211	123	75	42
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	119	59	34	21	12
Total Analysis Volume [veh/h]	78	474	234	137	83	47
Pedestrian Volume [ped/h]	0		1		2	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.00	0.31	0.06
d_M, Delay for Movement [s/veh]	8.22	0.00	0.00	0.00	24.16	10.28
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.21	0.00	0.00	0.00	1.26	0.21
95th-Percentile Queue Length [ft/ln]	5.23	0.00	0.00	0.00	31.61	5.15
d_A, Approach Delay [s/veh]	1.16		0.00		19.14	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.97					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 3: OR 224 / 17th Ave

Control Type:	Signalized	Delay (sec / veh):	27.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.778

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	160.00	100.00	130.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name						
Base Volume Input [veh/h]	433	53	336	232	93	514
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	11.00	1.00	6.00	5.00	5.00
Growth Factor	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	3	0	6	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	461	57	345	244	97	528
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	127	16	95	67	27	145
Total Analysis Volume [veh/h]	507	63	379	268	107	580
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	22		18		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	14.00

Phasing & Timing

Control Type	Permissive	Permissive	ProtPerm	Permissive	Permissive	Overlap
Signal Group	6	0	5	2	4	4
Auxiliary Signal Groups						4,5
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	5
Maximum Green [s]	40	0	50	40	20	20
Amber [s]	4.0	0.0	3.5	4.0	4.0	4.0
All red [s]	0.5	0.0	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	2.0	2.5	2.5	2.5
Minimum Recall	Yes		No	Yes	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	3
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	17

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	113	113	113	113	113	113
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	0.00	2.50	2.50	0.00
g_i, Effective Green Time [s]	33	33	67	67	20	71
g / C, Green / Cycle	0.30	0.30	0.59	0.59	0.18	0.63
(v / s)_i Volume / Saturation Flow Rate	0.28	0.04	0.29	0.15	0.06	0.37
s, saturation flow rate [veh/h]	1840	1404	1305	1810	1738	1551
c, Capacity [veh/h]	543	415	640	1077	306	977
d1, Uniform Delay [s]	38.94	29.47	11.81	10.94	41.07	12.41
k, delay calibration	0.29	0.11	0.32	0.11	0.11	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.31	0.17	2.61	0.12	0.68	2.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.93	0.15	0.59	0.25	0.35	0.59
d, Delay for Lane Group [s/veh]	56.25	29.64	14.42	11.06	41.75	15.07
Lane Group LOS	E	C	B	B	D	B
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	16.14	1.29	5.22	3.15	2.69	8.85
50th-Percentile Queue Length [ft/ln]	403.57	32.30	130.44	78.70	67.23	221.23
95th-Percentile Queue Length [veh/ln]	22.73	2.33	8.96	5.67	4.84	13.73
95th-Percentile Queue Length [ft/ln]	568.29	58.13	224.09	141.67	121.02	343.19

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	56.25	29.64	14.42	11.06	41.75	15.07
Movement LOS	E	C	B	B	D	B
d_A, Approach Delay [s/veh]	53.31		13.03		19.22	
Approach LOS	D		B		B	
d_I, Intersection Delay [s/veh]	27.32					
Intersection LOS	C					
Intersection V/C	0.778					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.247	2.503	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	889	889	444
d_b, Bicycle Delay [s]	14.04	14.02	27.22
l_b,int, Bicycle LOS Score for Intersection	2.500	2.627	1.560
Bicycle LOS	B	B	A

Sequence

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

Intersection Level Of Service Report
Intersection 4: Waverly Ct / Lava Dr

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.010

Intersection Setup

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

Volumes

Name												
Base Volume Input [veh/h]	0	0	2	32	0	0	0	0	0	2	7	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270	1.0270
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	25	0	0	0	8	0	0	3	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	2	58	0	0	0	8	0	2	10	32
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	16	0	0	0	2	0	1	3	9
Total Analysis Volume [veh/h]	0	0	2	64	0	0	0	9	0	2	11	36
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.26	7.29	0.00	8.99	9.47	8.69	8.81	9.18	8.45	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.21	0.21	0.21	0.03	0.03	0.03	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	5.31	5.31	5.31	0.78	0.78	0.78	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00			8.99			9.18			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.31											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 36: Waverly Ct / Site Access North

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.023

Intersection Setup

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

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	0	0	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	0	0	0	0	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	0	0	0	6
Total Analysis Volume [veh/h]	9	0	0	0	0	25
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	7.23	0.00	0.00	0.00	8.70	8.40
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.07	0.07
95th-Percentile Queue Length [ft/ln]	0.42	0.42	0.00	0.00	1.77	1.77
d_A, Approach Delay [s/veh]	7.23		0.00		8.40	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	8.09					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 37: Waverly Ct / SIte Access South

Control Type:	Two-way stop	Delay (sec / veh):	8.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

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

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	0	0	0	0	3
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	0	0	0	1
Total Analysis Volume [veh/h]	8	0	0	0	0	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.55	8.35	7.22	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.59	0.59	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.55		3.61		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.22					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 1: OR 99W / Harrison St / 17th St

Control Type:	Signalized	Delay (sec / veh):	42.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.945

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	370.00	100.00	100.00	375.00	100.00	100.00	100.00	100.00	150.00	135.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	257	819	165	103	1674	13	28	79	475	212	48	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	4.00	4.00	1.00	2.00	2.00	0.00	6.00	1.00	2.00	9.00	6.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	0	0	0	0	2	1	1	7	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	9	0	0	1	0	0	241	0	0	21
Total Hourly Volume [veh/h]	267	819	156	103	1674	14	29	80	241	212	50	13
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	67	207	39	26	423	4	7	20	61	54	13	3
Total Analysis Volume [veh/h]	270	827	158	104	1691	14	29	81	243	214	51	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			0			12			0		
v_di, Inbound Pedestrian Volume crossing m	12			0			12			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			0			13			6		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	60.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Overlap	Split	Split	Split
Signal Group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	4	10	0	6	10	0	0	6	6	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	0.0	3.5	3.5	0.0	4.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0
Split [s]	23	60	0	19	56	0	0	26	26	0	15	0
Vehicle Extension [s]	2.3	6.1	0.0	2.3	6.1	0.0	0.0	2.3	2.3	0.0	2.3	0.0
Walk [s]	0	7	0	0	11	0	0	8	8	0	5	0
Pedestrian Clearance [s]	0	17	0	0	18	0	0	21	21	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.5	0.0
Minimum Recall	No	Yes		No	Yes			No	No		No	
Maximum Recall	No	No		No	No			No	No		No	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.50	2.50
g_i, Effective Green Time [s]	19	68	68	9	58	58	16	39	11	11
g / C, Green / Cycle	0.16	0.57	0.57	0.07	0.48	0.48	0.13	0.32	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.15	0.27	0.28	0.06	0.46	0.46	0.06	0.15	0.08	0.08
s, saturation flow rate [veh/h]	1781	1840	1725	1795	1870	1865	1786	1571	1781	1692
c, Capacity [veh/h]	283	1046	980	131	902	900	237	509	158	150
d1, Uniform Delay [s]	50.09	15.43	15.50	54.78	29.56	29.62	48.17	32.29	54.23	54.22
k, delay calibration	0.13	0.50	0.50	0.07	0.50	0.50	0.07	0.14	0.07	0.07
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.88	1.60	1.75	6.46	19.27	19.62	0.87	0.88	11.18	11.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.48	0.49	0.79	0.95	0.95	0.46	0.48	0.90	0.90
d, Delay for Lane Group [s/veh]	67.97	17.03	17.25	61.23	48.84	49.24	49.03	33.16	65.41	65.80
Lane Group LOS	E	B	B	E	D	D	D	C	E	E
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	9.42	8.46	8.10	3.33	27.33	27.43	3.11	5.75	4.76	4.53
50th-Percentile Queue Length [ft/ln]	235.46	211.46	202.56	83.30	683.23	685.64	77.75	143.76	118.99	113.31
95th-Percentile Queue Length [veh/ln]	14.45	13.23	12.77	6.00	35.90	36.01	5.60	9.68	8.34	8.02
95th-Percentile Queue Length [ft/ln]	361.29	330.71	319.27	149.94	897.57	900.36	139.95	242.08	208.43	200.59

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	67.97	17.11	17.25	61.23	49.04	49.24	49.03	49.03	33.16	65.54	65.80	65.80
Movement LOS	E	B	B	E	D	D	D	D	C	E	E	E
d_A, Approach Delay [s/veh]	28.07			49.74			38.11			65.60		
Approach LOS	C			D			D			E		
d_I, Intersection Delay [s/veh]	42.46											
Intersection LOS	D											
Intersection V/C	0.945											

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	9.0	15.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	193.74	0.00	0.00	3296.31
d_p, Pedestrian Delay [s]	48.60	51.34	45.94	49.50
l_p,int, Pedestrian LOS Score for Intersection	3.038	2.843	2.596	2.195
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	933	867	367	175
d_b, Bicycle Delay [s]	17.08	19.27	40.28	50.11
l_b,int, Bicycle LOS Score for Intersection	2.602	3.053	2.540	2.053
Bicycle LOS	B	C	B	B

Sequence

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

Intersection Level Of Service Report
Intersection 2: Lava Dr / 17th Ave

Control Type:	Two-way stop	Delay (sec / veh):	28.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.396

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	50.00	100.00	100.00	100.00	100.00	65.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	38	280	514	61	79	68
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	4.00	2.00	2.00	1.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	14	0	0	21	14	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	280	514	82	93	77
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	74	137	22	25	20
Total Analysis Volume [veh/h]	55	298	547	87	99	82
Pedestrian Volume [ped/h]	1		1		8	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.01	0.00	0.40	0.16
d_M, Delay for Movement [s/veh]	9.04	0.00	0.00	0.00	28.51	13.59
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	0.19	0.00	0.00	0.00	1.79	0.58
95th-Percentile Queue Length [ft/ln]	4.63	0.00	0.00	0.00	44.87	14.53
d_A, Approach Delay [s/veh]	1.41		0.00		21.75	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.80					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 3: OR 224 / 17th Ave

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.669

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	160.00	100.00	130.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name						
Base Volume Input [veh/h]	290	85	515	524	89	331
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	5.00	1.00	2.00	2.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	2	0	17	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	302	87	515	541	93	331
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	22	130	137	23	84
Total Analysis Volume [veh/h]	305	88	520	546	94	334
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	6		31		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Permissive	Permissive	ProtPerm	Permissive	Permissive	Overlap
Signal Group	6	0	5	2	4	4
Auxiliary Signal Groups						4,5
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	5
Maximum Green [s]	40	0	50	40	20	20
Amber [s]	4.0	0.0	3.5	4.0	4.0	4.0
All red [s]	0.5	0.0	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	2.0	2.5	2.5	2.5
Minimum Recall	Yes		No	Yes	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	3
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	17

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	72	72	72	72	72	72
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	0.00	2.50	2.50	0.00
g_i, Effective Green Time [s]	14	14	37	37	9	49
g / C, Green / Cycle	0.20	0.20	0.51	0.51	0.13	0.68
(v / s)_i Volume / Saturation Flow Rate	0.16	0.06	0.35	0.29	0.05	0.21
s, saturation flow rate [veh/h]	1855	1503	1465	1870	1781	1602
c, Capacity [veh/h]	370	300	739	963	223	1094
d1, Uniform Delay [s]	27.72	24.56	11.98	12.02	29.17	4.58
k, delay calibration	0.11	0.11	0.19	0.11	0.11	0.24
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.68	0.54	2.15	0.53	1.26	0.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.29	0.70	0.57	0.42	0.31
d, Delay for Lane Group [s/veh]	32.40	25.10	14.13	12.55	30.43	4.93
Lane Group LOS	C	C	B	B	C	A
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.29	1.27	5.45	5.42	1.53	1.57
50th-Percentile Queue Length [ft/ln]	132.15	31.82	136.32	135.51	38.28	39.18
95th-Percentile Queue Length [veh/ln]	9.06	2.29	9.28	9.24	2.76	2.82
95th-Percentile Queue Length [ft/ln]	226.41	57.28	232.05	230.97	68.90	70.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.40	25.10	14.13	12.55	30.43	4.93
Movement LOS	C	C	B	B	C	A
d_A, Approach Delay [s/veh]	30.77		13.32		10.53	
Approach LOS	C		B		B	
d_I, Intersection Delay [s/veh]	16.32					
Intersection LOS	B					
Intersection V/C	0.669					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswa k Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.275	2.494	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	889	889	444
d_b, Bicycle Delay [s]	13.93	14.11	27.22
I_b,int, Bicycle LOS Score for Intersection	2.208	3.319	1.560
Bicycle LOS	B	C	A

Sequence

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

Intersection Level Of Service Report
Intersection 4: Waverly Ct / Lava Dr

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.018

Intersection Setup

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

Volumes

Name												
Base Volume Input [veh/h]	0	0	2	24	0	0	0	8	0	2	11	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	17	0	0	0	6	0	0	8	27
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	2	41	0	0	0	14	0	2	19	60
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	11	0	0	0	4	0	1	5	16
Total Analysis Volume [veh/h]	0	0	2	44	0	0	0	15	0	2	20	64
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.30	7.36	0.00	9.08	9.56	8.72	9.06	9.31	8.57	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.15	0.15	0.15	0.05	0.05	0.05	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	3.74	3.74	3.74	1.35	1.35	1.35	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00			9.08			9.31			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.67											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 34: Waverly Ct / Site Access North

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

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

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	0	0	0	0	17
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	0	0	0	0	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	0	0	0	0	4
Total Analysis Volume [veh/h]	27	0	0	0	0	17
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	7.26	0.00	0.00	0.00	8.89	8.37
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.05	0.05	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft/ln]	1.27	1.27	0.00	0.00	1.19	1.19
d_A, Approach Delay [s/veh]	7.26		0.00		8.37	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.69					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 35: Waverly Ct / Site Access South

Control Type:	Two-way stop	Delay (sec / veh):	8.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

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

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	0	0	0	0	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	0	0	0	2
Total Analysis Volume [veh/h]	6	0	0	0	0	8
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.56	8.36	7.23	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.44	0.44	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.56		3.62		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.67					
Intersection LOS	A					

Attachment G – Sight Distance Observations


SE LAVA
SE WAVERLY CT
STOP