

# Monroe Apartments

Transportation Impact Study  
Milwaukie, Oregon

**Date:**

July 16, 2019

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## ***Executive Summary***

1. The proposed Monroe Apartments will include the construction of a 234-unit apartment facility on two lots located north of Milwaukie Expressway (OR-224), south of SE Monroe Street, east of SE Oak Street, and west of SE 37<sup>th</sup> Avenue in Milwaukie, Oregon.
2. The trip generation calculations show that the proposed development is projected to generate 79 trips during the morning peak hour, 100 trips during the evening peak hour, and 1,274 average weekday trips.
3. Adequate planned off-street and on-street parking spaces will be available to serve the projected average peak parking demand of the proposed apartment facility.
4. No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. In addition, none of the study intersections exhibit crash rates near or above the 1.0 CMEV threshold nor do any of the study intersections along OR-224 have a crash rate exceeding ODOT's 90<sup>th</sup> percentile rate.
5. Adequate sight distances are available at both the proposed public site access intersection as well as the proposed emergency access intersection to ensure safe and efficient operation along SE 37<sup>th</sup> Avenue and SE Monroe Street, respectively.
6. Left-turn lane warrants are not projected to be met for the intersection of SE Washington Street at SE 37<sup>th</sup> Avenue for any of the analysis scenarios.
7. Due to insufficient main and side-street traffic volumes, traffic signal warrants are not projected to be met at the unsignalized study intersections under any of the analysis scenarios.
8. There are no locations along either SE Monroe Street or SE 37<sup>th</sup> Avenue where access spacing standards can be met. Accordingly, the proposed public access along SE 37<sup>th</sup> Avenue is planned at a location opposite of SE Washington Street. In addition, the emergency access along SE 37<sup>th</sup> Avenue is expected to serve nominal volumes of traffic on an average day, whereby safety impacts associated with this access are expected to be negligible.
9. Safe pedestrian routes between the site and nearby vicinity schools are available and adequate to serve needs of the proposed apartment facility.
10. All study intersections are currently operating acceptably per City of Milwaukie and ODOT standards and are projected to continue operating acceptably through the 2022 buildout year of the site.



## ***Project Description***

### ***Introduction***

The proposed Monroe Apartments will include the construction of a 234-unit apartment facility on two lots located north of Milwaukie Expressway (OR-224), south of SE Monroe Street, east of SE Oak Street, and west of SE 37<sup>th</sup> Avenue in Milwaukie, Oregon. Based on scoping work conducted by Kittelson & Associates, Inc., which included correspondence with City of Milwaukie and Oregon Department of Transportation (ODOT) staff, the report conducts safety and capacity/level of service analyses at the following intersections:

1. SE Harrison Street at OR-224;
2. SE Monroe Street at OR-224;
3. SE Oak Street at OR-224;
4. SE Edison Street at OR-224;
5. SE International Way at SE 37<sup>th</sup> Avenue;
6. SE Harrison Street at SE 32<sup>nd</sup> Avenue;
7. SE Railroad Avenue at SE Oak Street;
8. SE Monroe Street at SE 37<sup>th</sup> Avenue;
9. SE Washington Street at SE 37<sup>th</sup> Avenue (site access location); and
10. SE Railroad Avenue at SE 37<sup>th</sup> Avenue.

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

### ***Location Description***

The project site is located north of OR-224, south of SE Monroe Street, east of SE Oak Street, and west of SE 37<sup>th</sup> Avenue in Milwaukie, Oregon. The subject site is located within a mixed-use area of the City, with residential uses to the north and east, and commercial retail/restaurant/office uses to the south and west. One notable development of significance within the site vicinity includes the Milwaukie Market Place shopping center to the southwest.

The project site includes two tax lots (lot #3003 and #19203) which encompass an approximate total of 7.2 acres. Both lots are currently undeveloped. Future access to the site will be provided via a public access located along SE 37<sup>th</sup> Avenue, opposite of SE Washington Street, as well as an emergency fire access located along SE Monroe Street, just east of SE Oak Street.

### ***Vicinity Streets***

The proposed development is expected to impact 11 roadways near the site. Table 1 provides a description of each of the vicinity roadways.



**Table 1: Vicinity Roadway Descriptions**

Roadway	Jurisdiction	Functional Classification	Cross-Section	Speed	On-street Parking	Bicycle Lanes	Curbs	Sidewalks
SE Harrison Street	City of Milwaukie	Arterial	2 to 4 Lanes	25 mph Posted	Partially Permitted	Partial Both Sides	Both Sides	Both Sides
SE Monroe Street (west of railroad tracks)	City of Milwaukie	Collector	2 Lanes	25 mph Posted	Partially Permitted	None	Both Sides	Both Sides
SE Monroe Street (east of railroad tracks)	City of Milwaukie	Collector	2 Lanes	25 mph Posted	Permitted North Side	South Side	Both Sides	Both Sides
SE Oak Street	City of Milwaukie/ ODOT	Collector	3 to 6 Lanes	20 mph Statutory	Not Permitted	None	Both Sides	Both Sides
SE Washington Street	City of Milwaukie	Neighborhood Route/Local Street	2 Lanes	25 mph Statutory	Permitted Both Sides	None	Both Sides	Partial Both Sides
SE Edison Street	City of Milwaukie	Collector/ Neighborhood Route	2 Lanes	Basic Speed Rule	Partially Permitted	None	Partial Both Sides	Partial Both Sides
SE International Way	City of Milwaukie	Collector	3 Lanes	25 mph Posted	Not Permitted	None	Both Sides	Both Sides
OR-224	ODOT	Regional Route/ Statewide Hwy	5 to 6 Lanes	40/50 mph Posted	Not Permitted	None	Both Sides	Partial Both Sides
SE Railroad Avenue	City of Milwaukie	Collector	1 to 2 Lanes	Basic Speed Rule	Partial North Side	None	North Side	North Side
SE 32nd Avenue	City of Milwaukie	Collector	2 to 3 Lanes	25 mph Posted	Not Permitted	None	Both Sides	Partial Both Sides
SE 37th Avenue	City of Milwaukie	Collector/ Local Street	2 to 3 Lanes	Basic Speed Rule/25 mph Stat.	Partially Permitted	None	Partial Both Sides	Partial Both Sides

Note: Functional Classification based on *City of Milwaukie TSP* and *ODOT OHP*.

Jurisdiction based on *Milwaukie Road Jurisdiction Map* and *ODOT OHP*.



## Study Intersections

A majority of site trips generated by the proposed development are expected to impact ten nearby intersections of significance. A summarized description of these intersections is provided in Table 2.

**Table 2: Study Intersection Descriptions**

Number	Name	Geometry	Traffic Control	Phasing/Stopped Approaches
1	SE Harrison Street at OR-224	Four-Legged	Traffic Signal	Protected N/S LTs, Permitted E/W Approaches
2	SE Monroe Street at OR-224	Four-Legged	Traffic Signal	Protected N/S LTs, Permitted E/W Approaches
3	SE Oak Street at OR-224	Four-Legged	Traffic Signal	Protected SEB/NWB LTs, Permitted NEB/SWB LTs, Permitted/Protected SWB RT
4	SE Edison Street at OR-224	Four-Legged	Traffic Signal	Protected N/S LTs, Permitted E/W Approaches, Outermost WB RT Stop-Controlled
5	SE International Way at SE 37th Avenue	Four-Legged	Stop-Controlled	NB/WB Stop-Controlled Approaches, SB Stop-Controlled Shared RT/LT Lane, SB Free-Flow RT Lane, EB Free-Flow Approach
6	SE Harrison Street at SE 32nd Avenue	Four-Legged	Traffic Signal	Protected E/W LTs, Permitted N/S Approaches
7	SE Railroad Avenue at SE Oak Street	Three-Legged	Stop-Controlled	EB/WB Stop-Controlled Approaches
8	SE Monroe Street at SE 37th Avenue	Four-Legged	Stop-Controlled	All-way Stop-Controlled
9	SE Washington Street at SE 37th Avenue	Three-Legged	Stop-Controlled	WB Stop-Controlled Approach
10	SE Railroad Avenue at SE 37th Avenue	Three-Legged	Stop-Controlled	WB Stop-Controlled Approach

A vicinity map displaying the project site, vicinity streets, and the study intersections with their associated lane configurations is shown in Figure 1 on page 9.



## Public Transit

The project site is located near a four TriMet transit lines: bus line #29 – *Lake/Webster Rd*, #33 – *McLoughlin/King Rd*, #75 – *Cesar Chavez/Lombard*, and #152 – *Milwaukie*. All four bus lines have stops located within a half-mile walking/biking distance of the site.

TriMet bus line #29 – *Lake/Webster Rd* provides service between Milwaukie City Center and Clackamas Town Center Transit Center, with notable stops near Ledding Library and Milwaukie High School. The nearest bus stops to the site are located along SE Washington Street just west of SE Oak Street. Weekday service is scheduled from approximately 5:40 AM to 8:00 PM and has headways of approximately 60 to 90 minutes.

TriMet bus line #33 – *McLoughlin/King Rd* provides frequent service between Clackamas Community College Park & Ride and Clackamas Town Center Transit Center, with notable stops near Oregon City Health Center, Clackamas County Historic Museum, McLoughlin House, Oregon City Transit Center, Oregon City Shopping Center, and Milwaukie City Center. The nearest bus stops to the site are located along SE Harrison Street on both sides of SE 32<sup>nd</sup> Avenue. Weekday service is scheduled from approximately 4:15 AM to 1:50 AM and has headways of approximately 15 to 70 minutes. Weekend service is scheduled from approximately 5:30 AM to 1:50 AM and has headways of approximately 15 to 60 minutes.

TriMet bus line #75 – *Cesar Chavez/Lombard* provides frequent service between Pier Park in the St. Johns Neighborhood and Milwaukie City Center, with notable stops near Roosevelt High School, Columbia Park, N Lombard Transit Center, NAYA, Hollywood/NE 42<sup>nd</sup> Avenue Transit Center, Reed College, Providence Milwaukie Hospital, and Ledding Library. The nearest bus stops to the site are located along SE Harrison Street just west of SE 32<sup>nd</sup> Avenue and along SE 32<sup>nd</sup> Avenue just south of SE Meek Street. Weekday service is scheduled from approximately 4:45 AM and 1:30 AM and has headways of approximately 10 to 30 minutes. Weekend service is scheduled from approximately 5:30 AM to 1:40 AM and has headways of approximately 15 to 40 minutes.

TriMet bus line #152 – *Milwaukie* provides service between Milwaukie City Center and Clackamas Town Center Transit Center, with a notable stop near Exceed Enterprises. The nearest bus stops to the site are located along OR-224 just west of SE Oak Street. Weekday service is scheduled from approximately 6:30 AM to 6:35 PM and has headways of approximately 30 to 40 minutes.



VICINITY MAP



- LEGEND**
- STUDY INTERSECTION (EXISTING)
  - STUDY INTERSECTION (PROPOSED)
  - ⊥ STOP SIGN
  - 🚦 TRAFFIC SIGNAL
  - 🚲 BIKE LANE
  - ▭ PROJECT SITE
  - ARTERIAL ROADWAY
  - COLLECTOR ROADWAY
  - LOCAL ROADWAY
  - ++ RAILROAD TRACKS





## Site Trips

### Trip Generation

The proposed apartment facility will include the construction of two five-story and three three-story buildings, which will accommodate a total of 234 residential dwelling units. To estimate the number of trips generated by the proposed development, trip equations from the *Trip Generation Manual*<sup>1</sup> were used. Data from land use code 221, *Multifamily Housing (Mid-Rise)*, was used to estimate the proposed development's trip generation based on the number of dwelling units.

The trip generation calculations show that the proposed development is projected to generate 79 trips during the morning peak hour, 100 trips during the evening peak hour, and 1,274 average weekday trips. The trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included in the technical appendix to this report.

**Table 3: Trip Generation Summary**

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Proposed Apartment Facility	221	234 dwelling units	21	58	79	61	39	100	1,274

<sup>1</sup> Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10<sup>th</sup> Edition, 2017.



### *Trip Distribution*

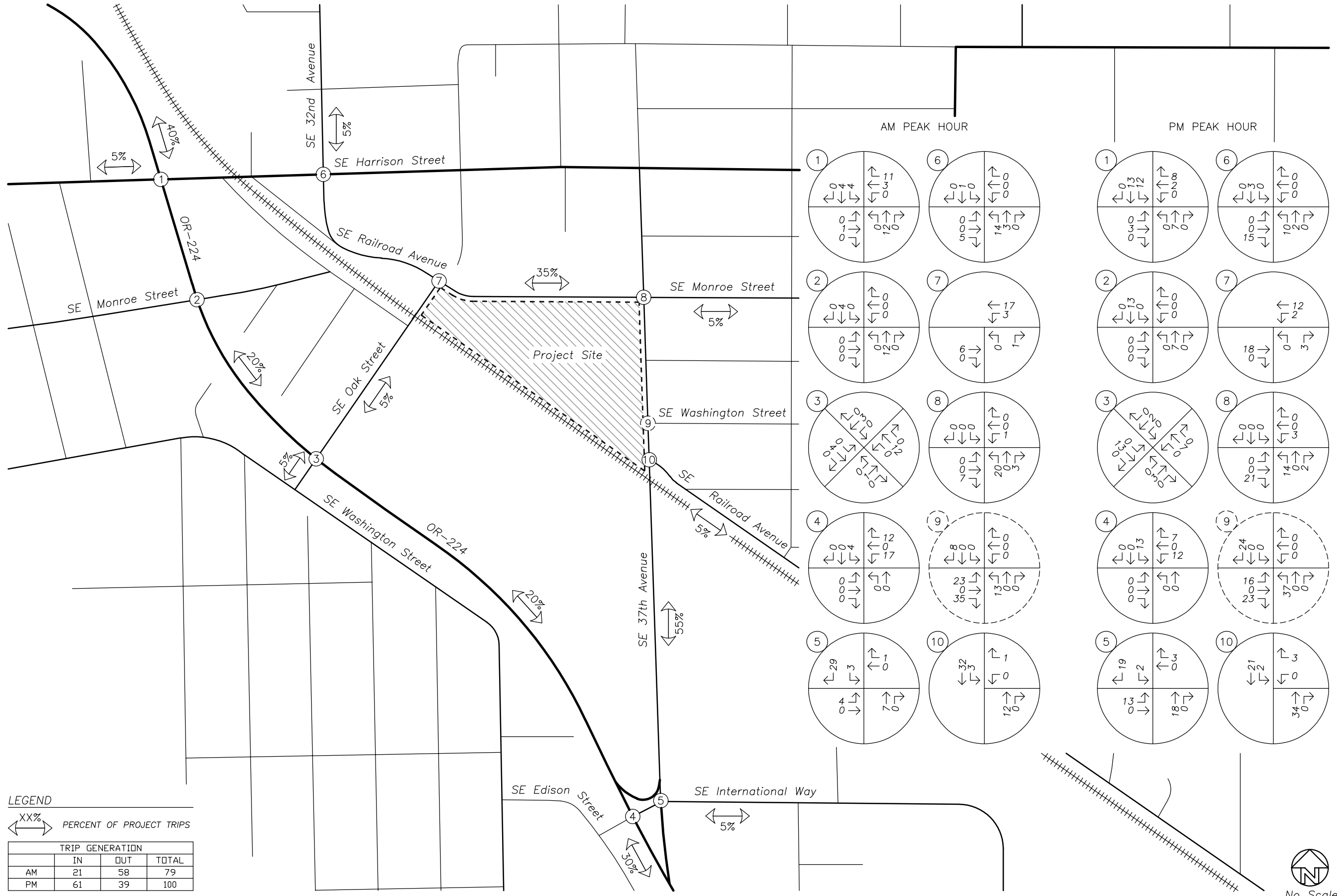
The directional distribution of site trips to/from the project site was estimated based on locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at the study intersections.

The following trip distribution was estimated and used for analysis:

- Approximately 40 percent of site trips will travel to/from the north along OR-224;
- Approximately 30 percent of site trips will travel to/from the south along OR-224;
- Approximately 5 percent of site trips will travel to/from the west along SE Harrison Street;
- Approximately 5 percent of site trips will travel to/from the southwest along SE Oak Street;
- Approximately 5 percent of site trips will travel to/from the north along SE 32<sup>nd</sup> Avenue;
- Approximately 5 percent of site trips will travel to/from the east along SE Monroe Street;
- Approximately 5 percent of site trips will travel to/from the east along SE Railroad Avenue; and
- Approximately 5 percent of site trips will travel to/from the east along SE International Way.

The trip distribution and assignment for the site trips generated by the proposed development during the morning and evening peak hours is shown in Figure 2 on page 12.

TRAFFIC VOLUMES  
Site Trip Distribution & Assignment  
AM & PM Peak Hours





## Parking Supply Analysis

To determine the number of off-street parking spaces that will be necessary to adequately serve the proposed apartment facility, a parking analysis was conducted. The projected parking demand that will be generated by the proposed use was estimated using rates from the manual *Parking Generation*<sup>2</sup>. Data for land use code 221, *Low/Mid-Rise Apartment*, was used to determine the total parking demand based on the number of dwelling units.

Based on the parking generation calculations, the proposed use is expected to generate an average parking demand of 288 vehicles. The proposed use will include the construction of 297 off-street parking spaces and 42 on-street parking spaces along SE Monroe Street and SE 37<sup>th</sup> Avenue, which results in a net availability of 51 parking spaces in excess of the average peak parking demand. Table 4 shows the projected peak parking demand generated by the proposed apartment facility, the total number of planned off-street and on-street parking spaces, and the net difference in available parking. Detailed parking generation calculations are included as an attachment to this memorandum.

Table 4: Parking Generation Summary

	ITE Code	Size	Average Peak Parking Demand	Proposed Available Parking			Net Available
				Off-Street	On-Street	Total	
Proposed Apartment Facility	221	234 dwelling units	288	297	42	339	51

Based on the parking analysis, adequate planned off-street and on-street parking spaces will be available to serve the projected average peak parking demand of the proposed apartment facility.

<sup>2</sup> Institute of Transportation Engineers (ITE), *Parking Generation*, 4<sup>th</sup> Edition, 2010.



## **Traffic Volumes**

### ***Existing Conditions***

Traffic counts were conducted at the study intersections on Thursday, February 7<sup>th</sup>, 2019 and Tuesday/Wednesday, April 9<sup>th</sup>/10<sup>th</sup>, 2019, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. Data was used from each intersection's respective morning and evening peak hours.

Figure 3 on page 15 shows the existing morning and evening peak hour traffic volumes at the study intersections.

### ***Background Conditions***

To provide an analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. In order to calculate the future traffic volumes for non-ODOT facilities, a compounded growth rate of two percent per year for an assumed buildout condition of three years was applied to the measured existing traffic volumes to approximate year 2022 background conditions.

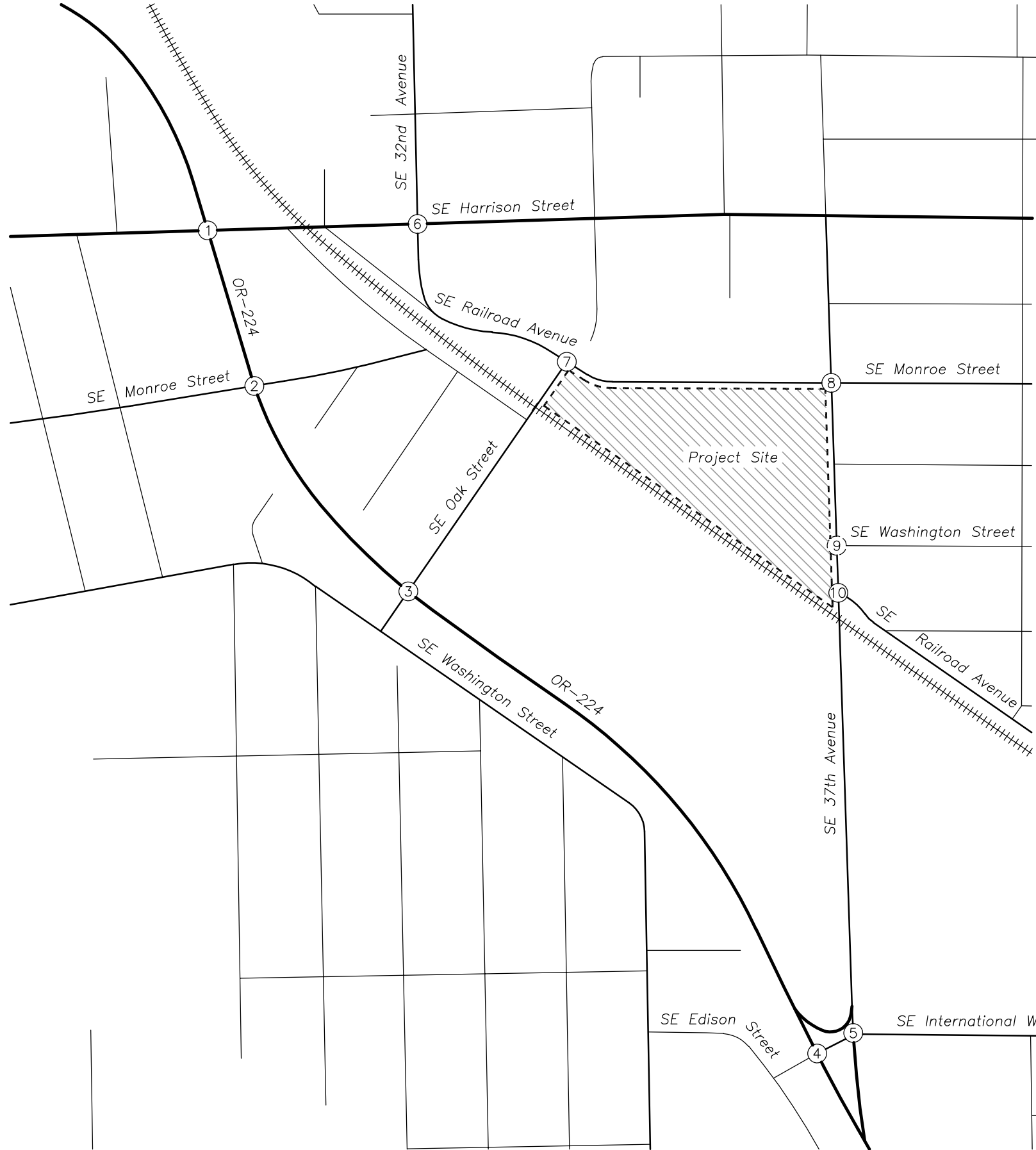
To estimate the future traffic volumes for ODOT facilities, a linear growth rate of 0.86 percent per year was calculated for the traffic volumes along OR-224 using data from ODOT's 2037 Future Volume Tables. This growth rate were applied to the measured existing traffic volumes over a three-year period to determine year 2022 background volumes for the through traffic traveling along OR-224. A compounded growth rate of two percent per year for an assumed buildout condition of three years was applied to all other turning movement traffic volumes.

Figure 4 on page 16 shows the projected year 2022 background traffic volumes at the study intersections during the morning and evening peak hours.

### ***Buildout Conditions***

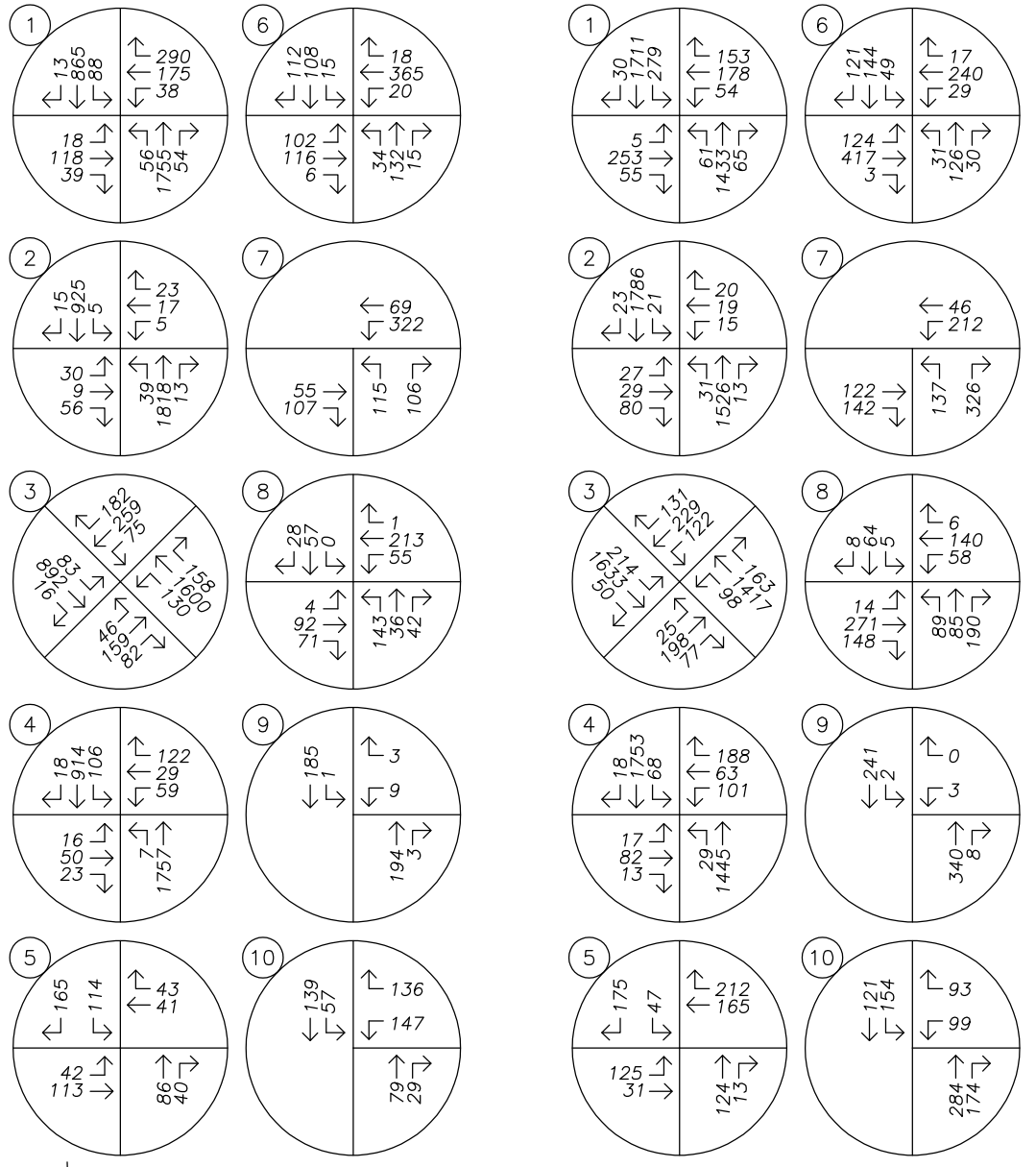
Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2022 background traffic volumes to obtain the expected year 2022 buildout volumes.

Figure 5 on page 17 shows the projected 2022 site buildout year traffic volumes at the study intersections during the morning and evening peak hours.



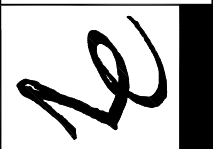
AM PEAK HOUR

PM PEAK HOUR



No Scale

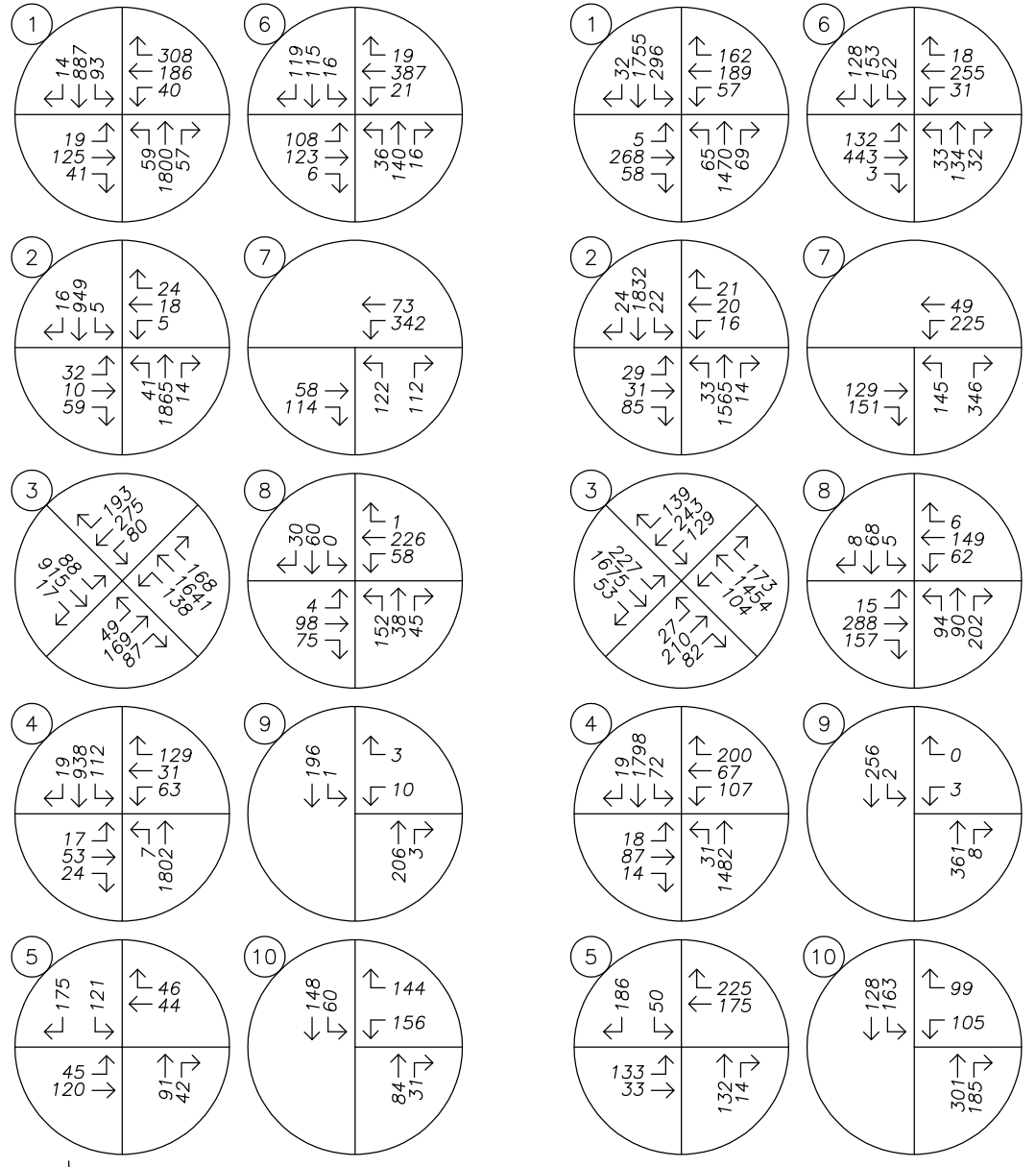
TRAFFIC VOLUMES  
Existing Conditions  
AM & PM Peak Hours





AM PEAK HOUR

PM PEAK HOUR



TRAFFIC VOLUMES  
Year 2022 Background Conditions  
AM & PM Peak Hours

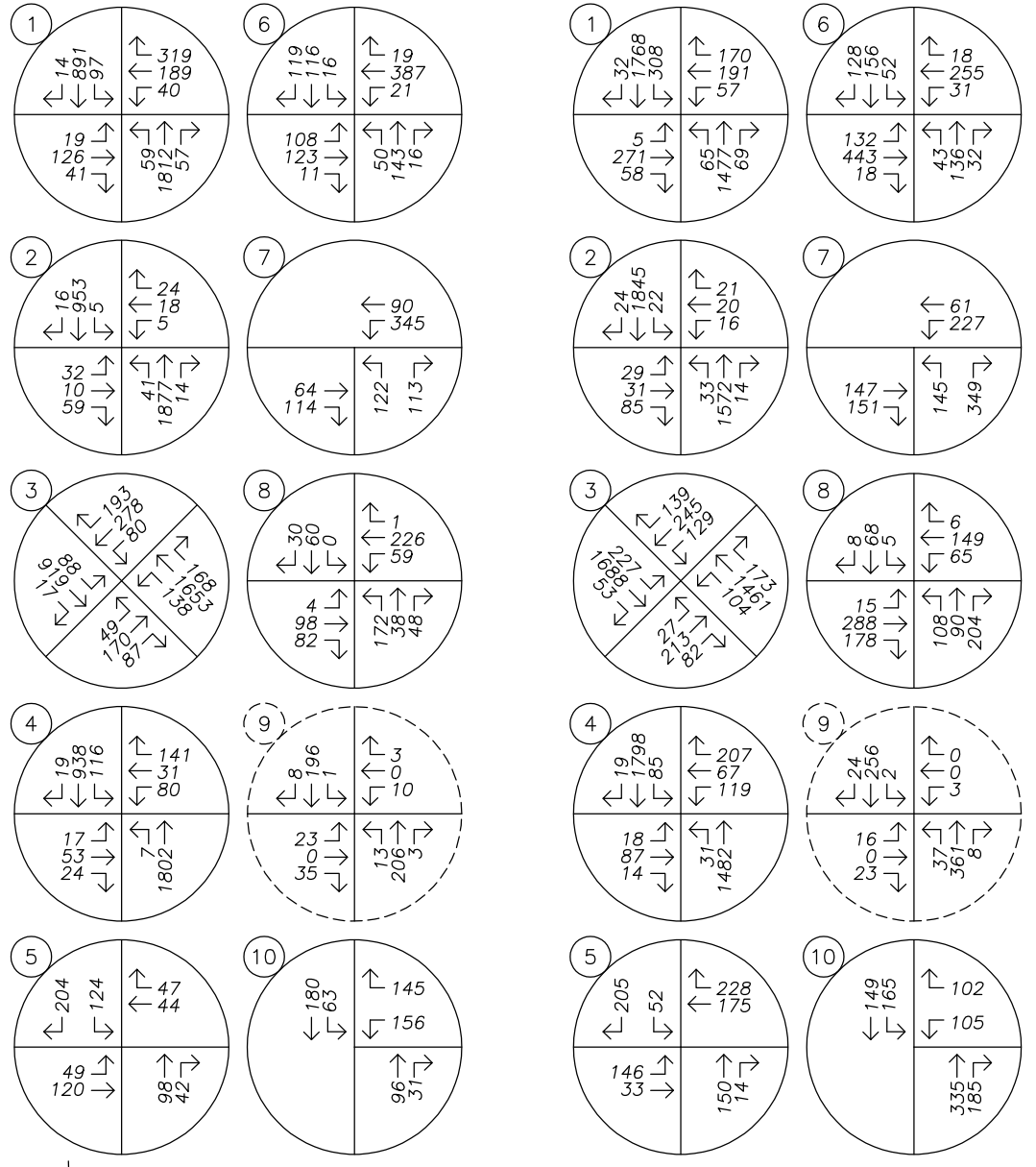






AM PEAK HOUR

PM PEAK HOUR



No Scale



TRAFFIC VOLUMES  
Year 2022 Buildout Conditions  
AM & PM Peak Hours



## Safety Analysis

### Crash Data Analysis

Using data obtained from ODOT's Crash Analysis and Reporting Unit, a review of the most recent available five years of crash history (January 2012 to December 2016) at the study intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection. Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak period represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection. Crash rates in excess of 1.0 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

With regard to crash severity, ODOT classifies crashes in the following categories:

- Property Damage Only (*PDO*);
- Possible Injury – Complaint of Pain (*Injury C*);
- Non-Incapacitating Injury (*Injury B*);
- Incapacitating Injury – Bleeding, Broken Bones (*Injury A*); and
- Fatality or Fatal Injury.

The study intersections along OR-224 are ODOT facilities which adhere to the crash analysis methodologies within ODOT's *Analysis Procedures Manual* (APM). According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of 90<sup>th</sup> percentile crash rates should be “flagged for further analysis”. For signalized intersections in urban settings, the 90<sup>th</sup> percentile rate for four-legged intersections is 0.860 CMEV.

Table 5 provides a summary of crash types while Table 6 summarizes crash severities and rates for each of the study intersections. Detailed ODOT crash reports are included in the technical appendix to this report.



Table 5: Crash Type Summary

	Intersection	Crash Type								Total Crashes	
		Rear End	Turn	Angle	Fixed Object	Side swipe	Head On	Other	Ped		Bike
1	SE Harrison Street at OR-224	16	10	6	0	0	0	0	0	0	32
2	SE Monroe Street at OR-224	5	1	4	0	0	0	0	1	0	11
3	SE Oak Street at OR-224	10	14	6	0	1	0	0	2	3	36
4	SE Edison Street at OR-224	4	5	1	0	0	0	0	1	0	11
5	SE International Way at SE 37th Avenue	1	6	3	0	0	0	0	0	0	10
6	SE Harrison Street at SE 32nd Avenue	1	8	2	1	0	0	0	0	0	12
7	SE Railroad Avenue at SE Oak Street	1	2	0	1	0	0	1	1	0	6
8	SE Monroe Street at SE 37th Avenue	0	2	0	0	0	0	0	0	0	2
9	SE Washington Street at SE 37th Avenue	0	0	0	0	0	0	1	0	0	1
10	SE Railroad Avenue at SE 37th Avenue	1	1	0	0	0	0	0	0	0	2



**Table 6: Crash Severity and Rate Summary**

	Intersection	Crash Severity					Total Crashes	AADT	Crash Rate
		PDO	C	B	A	Fatal			
1	SE Harrison Street at OR-224	14	14	2	1	1	32	42,770	0.41
2	SE Monroe Street at OR-224	3	7	0	1	0	11	35,900	0.17
3	SE Oak Street at OR-224	19	13	3	1	0	36	43,570	0.45
4	SE Edison Street at OR-224	5	4	1	1	0	11	39,100	0.15
5	SE International Way at SE 37th Avenue	8	2	0	0	0	10	8,920	0.61
6	SE Harrison Street at SE 32nd Avenue	5	5	2	0	0	12	13,310	0.49
7	SE Railroad Avenue at SE Oak Street	3	2	1	0	0	6	9,850	0.33
8	SE Monroe Street at SE 37th Avenue	2	0	0	0	0	2	10,780	0.10
9	SE Washington Street at SE 37th Avenue	1	0	0	0	0	1	5,940	0.09
10	SE Railroad Avenue at SE 37th Avenue	2	0	0	0	0	2	9,250	0.12

**BOLDED** text indicates a crash rate in excess of either 1.0 CMEV or the 90th-Percentile CMEV per ODOT's APM.

Based on the review of the crash data, there were eight crashes which involved either a pedestrian or bicyclist and five crashes which resulted in injuries consistent with *Injury A* classification or a fatality. An in-depth analysis of these intersections and crashes is detailed in the following sections.

### **SE Harrison Street at OR-224**

The intersection of SE Harrison Street at OR-224 had one crash that was classified as *Injury A* and one crash which resulted in a fatality. The *Injury A* collision occurred when the driver of a northbound passenger car disregarded the traffic signal and collided with a southbound left-turning passenger car. The driver of the northbound vehicle sustained injuries consistent with *Injury C* classification while the driver of the southbound vehicle sustained injuries consistent with *Injury A* classification.

One crash at the study intersection resulted in a fatality over the five-year analysis period. The crash involved one southbound traveling passenger car and one eastbound motorcycle, and occurred at 3:00 PM on Sunday, January 25<sup>th</sup>, 2015. Driving conditions at the time of the collision were during daylight conditions with clear



weather and dry roadways. The crash occurred when the driver of the passenger car disregarded the traffic signal and collided with the motorcycle. The driver of the passenger car sustained no injuries while the motorcyclist sustained fatal injuries.

### *SE Monroe Street at OR-224*

The intersection of SE Monroe Street at OR-224 had one crash that involved a pedestrian and one crash that was classified as *Injury A*. The pedestrian-related collision occurred when the driver of an eastbound right-turning passenger car failed to yield right-of-way to an east/west traveling pedestrian who was utilizing an intersection crosswalk. The pedestrian sustained injuries consistent with *Injury C* classification. The *Injury A* collision occurred when the driver of an eastbound passenger car was inattentive, disregarded the traffic signal, and collided with a northbound passenger car. The driver of the eastbound vehicle sustained no injuries while the driver of the northbound passenger car was injured.

### *SE Oak Street at OR-224*

The intersection of SE Oak Street at OR-224 had five crashes that involved either a pedestrian or a bicyclist, one of which was classified as *Injury A*. The following includes a listed description of each crash:

- A southeast/northwest traveling pedestrian, who was utilizing an intersection crosswalk, disregarded the traffic signal, illegally entered the intersection, and was struck by a southwest-bound right-turning passenger car. The pedestrian sustained injuries consistent with *Injury B* classification.
- The driver of a northwest-bound right-turning passenger car failed to yield right-of-way to a northwest/southeast traveling bicyclist, who was utilizing an intersection crosswalk. The bicyclist sustained injuries consistent with *Injury C* classification.
- A southwest/northeast traveling bicyclist, who was utilizing an intersection crosswalk, disregarded the traffic signal, illegally entered the intersection, and collided with a southeast-bound passenger car. The bicyclist sustained injuries consistent with *Injury A* classification while the driver of the passenger car sustained injuries consistent with *Injury B* classification.
- The driver of a southwest-bound left-turning passenger car failed to yield right-of-way to a northeast/southwest traveling pedestrian, who was utilizing an intersection crosswalk. The pedestrian sustained injuries consistent with *Injury C* classification.
- The driver of a southwest-bound right-turning passenger car failed to yield right-of-way to a southwest/northeast traveling bicyclist, who was utilizing an intersection crosswalk. The bicyclist sustained injuries consistent with *Injury B* classification.

### *SE Edison Street at OR-224*

The intersection of SE Edison Street at OR-224 had one crash that involved a pedestrian, which was classified as *Injury A*. The crash occurred when a southwest/northeast traveling pedestrian, who was utilizing an intersection crosswalk, disregarded the traffic signal, illegally entered the intersection, and was struck by a northwest-bound passenger car. The pedestrian sustained injuries consistent with *Injury A* classification.



### *SE Railroad Avenue at SE Oak Street*

The intersection of SE Railroad Avenue at SE Oak Street had one crash that involved a pedestrian. The crash occurred when the driver of a northwest-bound left-turning passenger car failed to yield right-of-way to a northeast/southwest traveling pedestrian, who was utilizing an intersection crosswalk. The pedestrian sustained injuries consistent with *Injury C* classification.

### *Analysis Conclusions*

Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. In addition, none of the study intersections exhibit crash rates near or above the 1.0 CMEV threshold nor do any of the study intersections along OR-224 have a crash rate exceeding ODOT's 90<sup>th</sup> percentile rate. Accordingly, no safety mitigation is recommended per the crash data analysis.

### *Sight Distance Analysis*

Intersection sight distance was measured for the proposed site access intersection located along SE 37<sup>th</sup> Avenue as well as for a proposed emergency access along SE Monroe Street. Sight distance was measured and evaluated in accordance with standards established in *A Policy on Geometric Design of Highways and Streets*<sup>3</sup>. According to AASHTO, the driver's eye is assumed to be 15 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye-height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

### *Site Access at SE 37<sup>th</sup> Avenue*

SE 37<sup>th</sup> Avenue does not have a posted speed; therefore, a design speed of 35 mph for Collectors was assumed for the roadway based on Section 5.0017 *Design Speed* from the *City of Milwaukie Public Works Standards* (revised November 28<sup>th</sup>, 2018). Based on a design speed of 35 mph, the minimum recommended intersection sight distance to ensure safe and efficient operation of the proposed access intersection is 390 feet to the north and south along the major-street.

Intersection sight distance at the proposed site access along SE 37<sup>th</sup> Avenue was measured to be in excess of 600 feet to the south and measured back to the all-way stop-controlled intersection of SE Monroe Street at SE 37<sup>th</sup> Avenue (located approximately 491 feet to the north).

### *Emergency Access at SE Monroe Street*

Based on a posted speed of 25 mph along SE Monroe Street, the minimum recommended intersection sight distance to ensure safe and efficient operation of the proposed emergency access intersection is 280 feet to

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<sup>3</sup> American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6<sup>th</sup> Edition, 2011.



the east and west along the major-street. Intersection sight distance at the emergency access intersection was measured to be in excess of 300 feet to the east and west.

### *Analysis Conclusions*

Based on the sight distance analysis, adequate sight distances are available at both the proposed public site access intersection as well as the proposed emergency access intersection to ensure safe and efficient operation along SE 37<sup>th</sup> Avenue and SE Monroe Street, respectively. No sight distance mitigation is necessary or recommended.

### *Warrant Analysis*

Left-turn lane and traffic signal warrants were examined for the study intersections where such treatments would be applicable.

#### *Left-Turn Lane Warrants*

A left-turn refuge lane is primarily a safety consideration for the major-street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants were examined using methodologies provided within the *National Cooperative Highway Research Program's (NCHRP) Report 457*. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through lanes.

Left-turn lane warrants are not projected to be met at the intersection of SE Washington Street at SE 37<sup>th</sup> Avenue for any of the analysis scenarios. Accordingly, no new turn lanes are projected to be necessary or recommended.

#### *Preliminary Traffic Signal Warrants*

Preliminary traffic signal warrants were examined for the unsignalized study intersections to determine whether the installation of a new traffic signal will be warranted at these intersections upon completion of the proposed development. Due to insufficient main and side-street traffic volumes, traffic signal warrants are not projected to be met at the unsignalized study intersections under any of the analysis scenarios.

### *Access Spacing Standards*

According to City of Milwaukie Municipal Code Section *12.16.040 Access Requirements and Standards*, spacing for accessways along Collector roadways shall be a minimum of 300 feet, measured between the nearest edge of driveway aprons between accessways or the nearest edge of the driveway apron to the nearest face of curb of the intersecting street (or nearest edge of pavement if no curb is available).

Based on an assessment of the adjacent roadways to the site, there are no locations along either SE Monroe Street or SE 37<sup>th</sup> Avenue where access spacing standards can be met (i.e. spacing with driveways and



intersecting roadways along either sides of the adjacent streets). Accordingly, the proposed public access along SE 37<sup>th</sup> Avenue is planned at a location opposite of SE Washington Street. In addition, the emergency access along SE 37<sup>th</sup> Avenue is expected to serve nominal volumes of traffic on an average day, whereby the safety impacts associated with this access are expected to be negligible.

### *Safe Pedestrian Routes to Vicinity School*

According to the North Clackamas School District's school boundary maps, there are four nearby public schools which may reasonably serve the site:

- Milwaukie High School & Milwaukie Academy of the Arts;
- Ardenwald Elementary; and
- Rowe Middle School.

#### *Milwaukie High School & Milwaukie Academy of the Arts*

Milwaukie High School & Milwaukie Academy of the Arts are located within a 0.75-mile walking/biking distance to the southwest of the site. Pedestrian travel between the school and site is available by way of SE Oak Street and SE Washington Street. Complete sidewalks are available along both sides of these roadways, with marked crossings across SE Oak Street (three relevant marked crosswalks including two that are signalized), OR-224 (two relevant signalized marked crosswalks), and SE Washington Street (eight relevant marked crosswalks).

#### *Ardenwald Elementary*

Ardenwald Elementary is located within a 1.25-mile walking/biking distance to the north of the site. Pedestrian travel between the school and site is available by way of SE Monroe Street/SE Railroad Avenue, SE 32<sup>nd</sup> Avenue, and SE Roswell Street. Complete sidewalks are available along both sides of SE Monroe Street, the north side of SE Railroad Avenue, generally along both sides of SE 32<sup>nd</sup> Avenue, and along the south side of SE Roswell Street. Relevant marked crossings are available across SE Monroe Street/SE Railroad Avenue (two marked crosswalks) and SE Harrison Street (one signalized marked crosswalk). Marked crosswalks/sidewalks are available at intersections along the east side of SE 32<sup>nd</sup> Avenue and along the south side of SE Roswell Street.

#### *Rowe Middle School*

Rowe Middle School is located within a 0.75-mile walking/biking distance to the south of the site. Pedestrian travel between the school and site is available by way of SE 37<sup>th</sup> Avenue (segment north of OR-224), SE Edison Street, SE 37<sup>th</sup> Avenue (segment south of OR-224), SE Grogan Avenue, and SE 36<sup>th</sup> Avenue. Sidewalks are generally complete along the west side of SE 37<sup>th</sup> Avenue (segment north of OR-224), both sides of SE Edison Street, east side of SE 37<sup>th</sup> Avenue (segment south of OR-224), both sides of SE Grogan Avenue, and both sides of SE 36<sup>th</sup> Avenue. Relevant marked crossings are available across SE 37<sup>th</sup> Avenue (two marked crosswalks on the segment north of OR-224), SE Edison Street (two marked crosswalks), OR-





224 (two signalized marked crosswalks), and SE Lake Road (two marked crosswalks). While no marked crosswalks are available crossing the segment of SE 37<sup>th</sup> Avenue south of OR-224, low vehicular travel speeds (posted speed of 25 mph) and relatively low vehicular volumes allow pedestrians the ability to safely cross the roadway at the intersection with SE Grogan Avenue.

Based on the above analysis, safe pedestrian routes between the site and nearby vicinity schools are available and adequate to serve needs of the proposed apartment facility.



## **Operational Analysis**

### **Intersection Capacity Analysis**

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

According to City of Milwaukie's *Transportation System Plan* (TSP) Article 13, intersections under City jurisdiction are required to operate at LOS D or better. For intersections under ODOT jurisdiction (i.e. intersections along OR-224), per *Table 7: Volume to Capacity Ratio Targets within Portland Metropolitan Region of the Oregon Highway Plan* (OHP) intersections are required to operate with v/c ratios of 0.99 or less.

Preliminary analysis results utilizing HCM methodologies at the intersection of SE Railroad Avenue at SE Oak Street indicate the intersection operates at LOS F under existing conditions during both the morning and evening peak hours. Due to the unique traffic controls at the intersection as well as intersection observations conducted during the peak 15 minutes of the morning and evening peak hours, it was determined the HCM methodologies are reporting significantly inflated delays at the intersection. Therefore, in place of utilizing HCM reports at the intersection, five SimTraffic simulation trials were run during both the morning and evening peak hours to determine existing and future condition delays at the intersection. It should be noted the simulation results under existing conditions more accurately reflect the observed delays in the field.

The v/c, delay, and LOS results of the capacity analysis are shown in Table 7 for the morning and evening peak hours. The reported results are generally based on the analysis methodologies provided in the HCM 2000. While more recent versions of the HCM are available, the methodologies used in the later editions (utilizing Trafficware software) do not report all v/c ratios for individual turning movements nor does it provide an overall v/c ratio for signalized intersections, which are the standards by which ODOT evaluates intersection operation.

Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

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<sup>4</sup> Transportation Research Board, *Highway Capacity Manual*, 2000.



Table 7: Intersection Capacity Analysis Summary

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
<b>1 SE Harrison Street at OR-224</b>						
2019 Existing Conditions	C	22	0.89	C	26	0.82
2022 Background Conditions	C	24	0.92	C	27	0.86
2022 Buildout Conditions	C	25	0.94	C	28	0.87
<b>2 SE Monroe Street at OR-224</b>						
2019 Existing Conditions	A	7	0.71	A	7	0.70
2022 Background Conditions	A	7	0.74	A	7	0.72
2022 Buildout Conditions	A	7	0.74	A	7	0.73
<b>3 SE Oak Street at OR-224</b>						
2019 Existing Conditions	C	22	0.74	C	24	0.84
2022 Background Conditions	C	24	0.76	C	26	0.88
2022 Buildout Conditions	C	24	0.77	C	27	0.88
<b>4 SE Edison Street at OR-224</b>						
2019 Existing Conditions	C	20	0.80	B	18	0.83
2022 Background Conditions	C	22	0.82	B	19	0.86
2022 Buildout Conditions	C	24	0.84	B	20	0.88
<b>5 SE International Way at SE 37th Avenue</b>						
2019 Existing Conditions	A	9	-	A	8	-
2022 Background Conditions	A	9	-	A	8	-
2022 Buildout Conditions	A	9	-	A	8	-

**BOLDED** results indicate operation above acceptable jurisdictional standards.



Table 7: Intersection Capacity Analysis Summary (continued)

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
<b>6 SE Harrison Street at SE 32nd Avenue</b>						
2019 Existing Conditions	B	18	0.51	B	18	0.58
2022 Background Conditions	B	19	0.54	B	18	0.61
2022 Buildout Conditions	B	20	0.56	B	19	0.63
<b>7 SE Railroad Avenue at SE Oak Street*</b>						
2019 Existing Conditions	B	10	-	B	13	-
2022 Background Conditions	B	11	-	C	18	-
2022 Buildout Conditions	B	13	-	C	19	-
<b>8 SE Monroe Street at SE 37th Avenue</b>						
2019 Existing Conditions	B	11	-	C	18	-
2022 Background Conditions	B	11	-	C	22	-
2022 Buildout Conditions	B	12	-	C	25	-
<b>9 Site Access at SE 37th Avenue</b>						
2019 Existing Conditions	B	11	0.13	B	13	0.23
2022 Background Conditions	B	11	0.14	B	13	0.24
2022 Buildout Conditions	B	13	0.14	C	16	0.24
<b>10 SE Railroad Avenue at SE 37th Avenue</b>						
2019 Existing Conditions	B	11	0.33	C	22	0.51
2022 Background Conditions	B	11	0.36	D	26	0.59
2022 Buildout Conditions	B	12	0.39	D	32	0.65

**BOLDED** results indicate operation above acceptable jurisdictional standards.

\* Results based on simulation models rather than HCM capacity results.

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of Milwaukie and ODOT standards and are projected to continue operating acceptably through the 2022 buildout year of the site. No operational mitigation is necessary or recommended at these intersections.



## **Conclusions**

Adequate planned off-street and on-street parking spaces will be available to serve the projected average peak parking demand of the proposed apartment facility.

No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. In addition, none of the study intersections exhibit crash rates near or above the 1.0 CMEV threshold nor do any of the study intersections along OR-224 have a crash rate exceeding ODOT's 90<sup>th</sup> percentile rate.

Adequate sight distances are available at both the proposed public site access intersection as well as the proposed emergency access intersection to ensure safe and efficient operation along SE 37<sup>th</sup> Avenue and SE Monroe Street, respectively.

Left-turn lane warrants are not projected to be met for the intersection of SE Washington Street at SE 37<sup>th</sup> Avenue for any of the analysis scenarios.

Due to insufficient main and side-street traffic volumes, traffic signal warrants are not projected to be met at the unsignalized study intersections under any of the analysis scenarios.

There are no locations along either SE Monroe Street or SE 37<sup>th</sup> Avenue where access spacing standards can be met. Accordingly, the proposed public access along SE 37<sup>th</sup> Avenue is planned at a location opposite of SE Washington Street. In addition, the emergency access along SE 37<sup>th</sup> Avenue is expected to serve nominal volumes of traffic on an average day, whereby safety impacts associated with this access are expected to be negligible.

Safe pedestrian routes between the site and nearby vicinity schools are available and adequate to serve needs of the proposed apartment facility.

All study intersections are currently operating acceptably per City of Milwaukie and ODOT standards and are projected to continue operating acceptably through the 2022 buildout year of the site.



*Appendix*







# BUILDING HEIGHT VARIANCE - TYPE III

## SITE PLAN

SCALE: 1" = 100'-0"

GMU

### SITE PLAN LEGEND

-  EXISTING TREE
-  STREET TREE
-  STREET TREE
-  DECIDUOUS CANOPY TREE
-  DECIDUOUS ORNAMENTAL TREE
-  CONIFER TREE

NOTE: SEE ZONING CRITEREA FOR MORE INFO



## KEYNOTES XX

- 01 ENTRY / EXIT
- 02 CLUBHOUSE
- 03 BUILDING 1, 5 STORIES, 84 UNITS, TYPE V
- 04 BUILDING 2, 3 STORIES, 36 UNITS, TYPE II
- 05 BUILDING 3, 3 STORIES, 36 UNITS, TYPE II
- 06 BUILDING 4, 3 STORIES, 36 UNITS, TYPE II
- 07 BUILDING 5, 3 STORIES, 42 UNITS, TYPE I
- 08 GARAGE 1 (G1)
- 09 GARAGE 2 (G2)
- 10 GARAGE 3 (G3)
- 11 GARAGE 4 (G4)
- 12 GARAGE 5 W/ ADA STALL (G5)
- 13 CARPORT
- 14 BIOSWALE
- 15 FIRE LANE ONLY
- 16 42" CONTINUOUS GATED FENCE
- 17 PUBLIC SIDEWALK EASEMENT
- 18 6' ROW DEDICATION
- 19 6' BIKE LANE
- 20 LIVE WORK UNIT, TYPICAL
- 21 AERIAL APPARATUS
- 22 EXISTING ADA RAMP
- 23 IMPROVED PUBLIC PARK 1,651 SF
- 24 NEW 5' PUBLIC SIDEWALK, CURB, AND GUTTER
- 25 MONUMENT SIGN
- 26 15' MINIMUM SETBACK 20' MAXIMUM
- 27 GUARDRAIL
- 28 10' PEDESTRIAN PATH / 15' EASEMENT
- 29 PRIVATE GARAGES, TYPICAL
- 30 FIRE LOOP
- 31 DOG WALK 6,926 SF
- 32 OUTDOOR AREA 8,556 SF
- 33 OUTDOOR AREA 3,890 SF
- 34 GARDEN 2,915 SF
- 35 PLAZA 5,555 SF
- 36 OUTDOOR AREA 1,163 SF
- 37 PLAYGROUND 4,766 SF
- 38 BIKE PATH 10,923 SF
- 39 TRASH AREA
- 40 RAIL LINE
- 41 STORAGE
- 42 8' FENCE
- 43 PERSONAL STORAGE





## TRIP GENERATION CALCULATIONS Proposed Development

*Land Use:* Multifamily Housing (Mid-Rise)  
*Land Use Code:* 221  
*Setting/Location:* General Urban/Suburban  
*Variable:* Dwelling Units  
*Variable Value:* 234

### AM PEAK HOUR

*Trip Equation:*  $\ln(T)=0.98\ln(X)-0.98$

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	<b>21</b>	<b>58</b>	<b>79</b>

### PM PEAK HOUR

*Trip Equation:*  $\ln(T)=0.96\ln(X)-0.63$

	Enter	Exit	Total
Directional Distribution	61%	39%	
Trip Ends	<b>61</b>	<b>39</b>	<b>100</b>

### WEEKDAY

*Trip Equation:*  $T=5.45(X)-1.75$

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	<b>637</b>	<b>637</b>	<b>1,274</b>

### SATURDAY

*Trip Equation:*  $T=3.04(X)+417.11$

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	<b>564</b>	<b>564</b>	<b>1,128</b>

Source: TRIP GENERATION, Tenth Edition





PARKING GENERATION CALCULATIONS  
Proposed Development

*Land Use:* Low/Mid-Rise Apartment  
*Land Use Code:* 221  
*Variable:* Dwelling Units  
*Variable Value:* 234

**SUBURBAN - WEEKDAY**

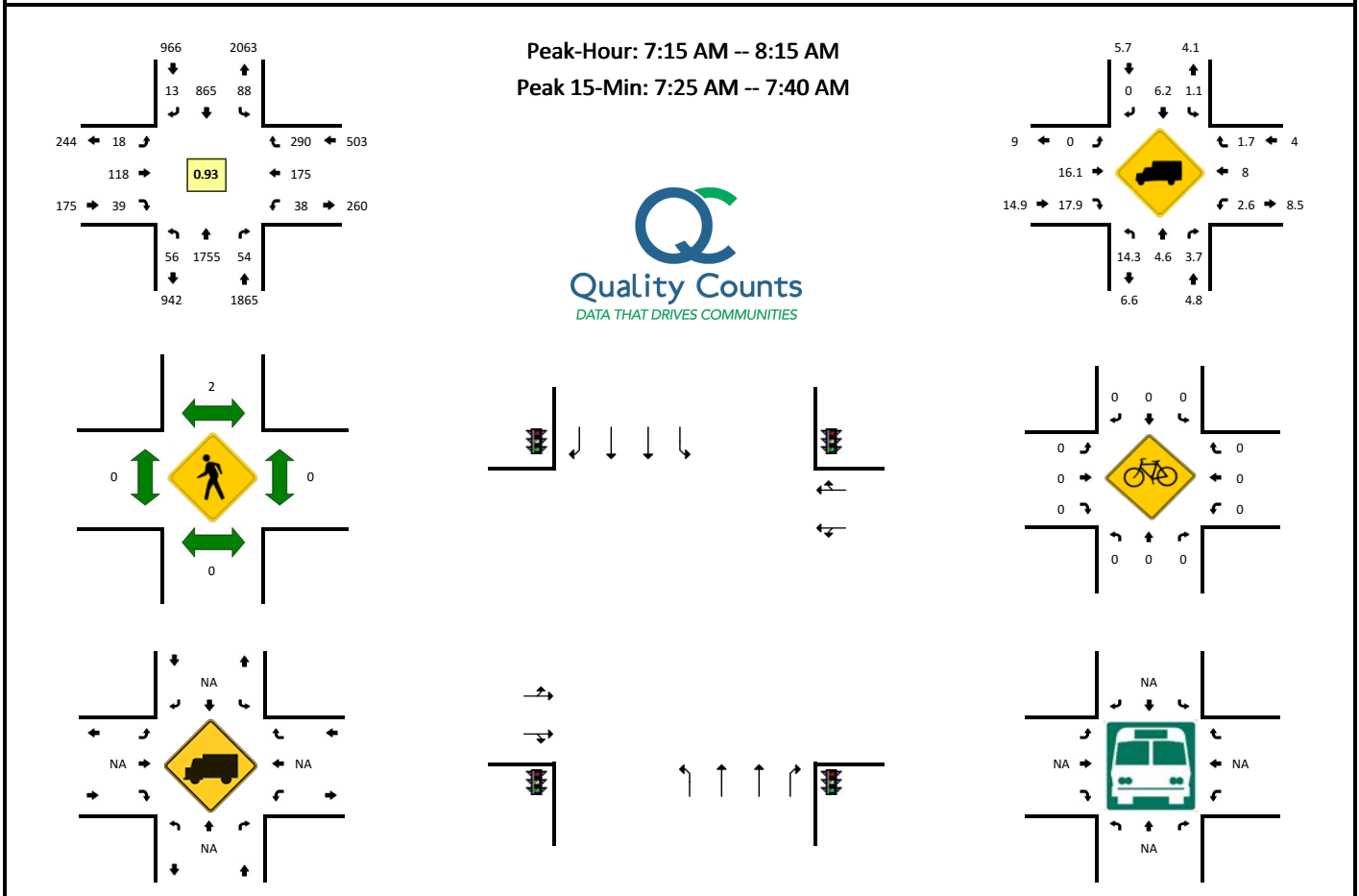
<i>Peak Period</i>	12:00 - 5:00 a.m.	
<i>Number of Study Sites</i>	21	
<i>Avg. Size of Study Sites</i>	311	dwelling units
<i>Avg. Peak Period Parking Demand</i>	1.23	vehicles per dwelling unit
<i>Standard Deviation</i>	0.32	
<i>Coefficient of Variation</i>	21%	
<i>Range</i>	0.59-1.94	vehicles per dwelling unit
<i>85th Percentile Rate:</i>	1.94	vehicles per dwelling unit
<i>33rd Percentile Rate:</i>	0.68	vehicles per dwelling unit

Peak Parking Demand	<b>288</b>
85th Percentile Parking Demand	<b>454</b>

Source: PARKING GENERATION, Fourth Edition

**LOCATION:** Milwaukie Expy -- SE Harrison St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894501  
**DATE:** Thu, Feb 7 2019

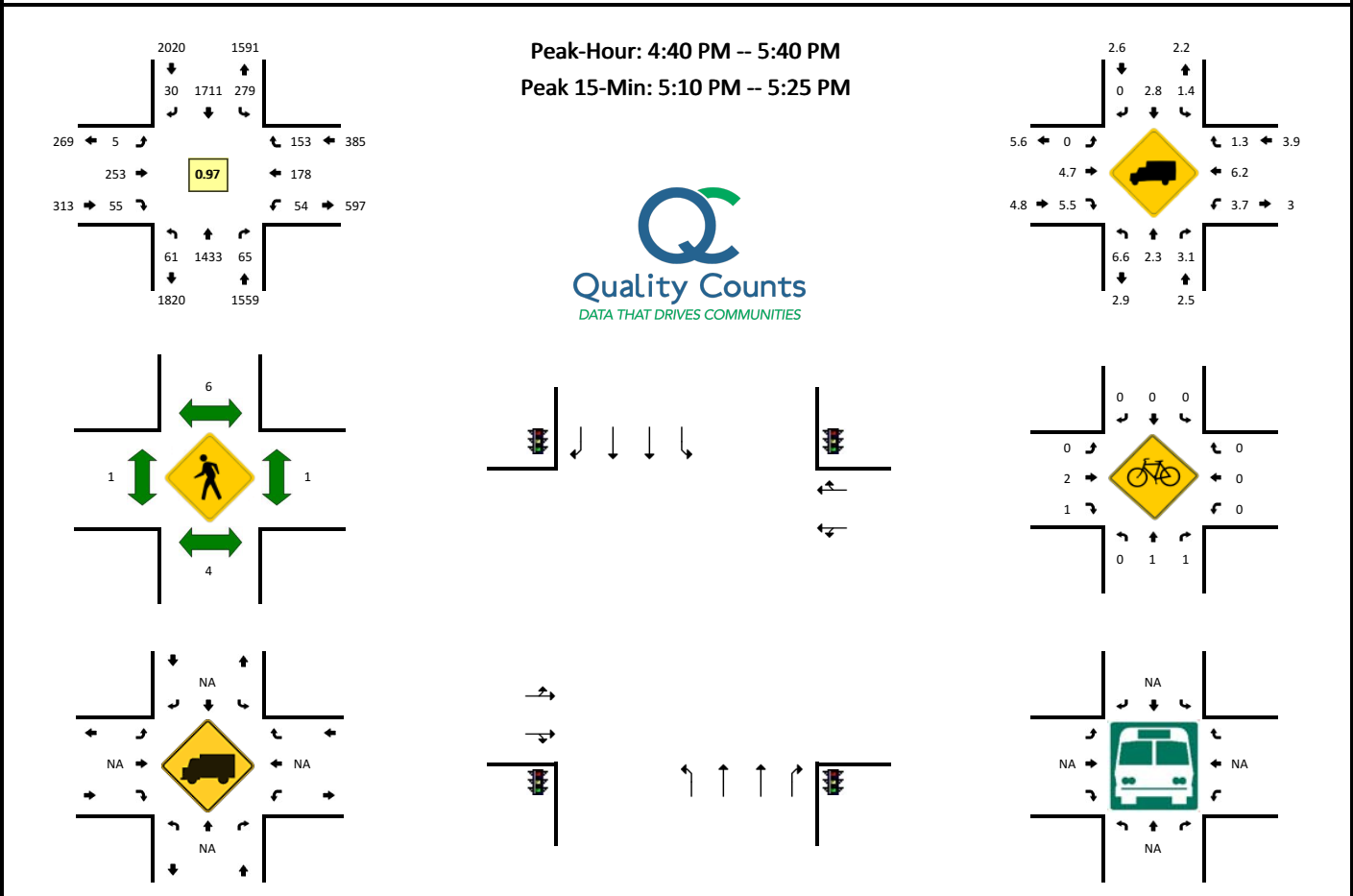


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Harrison St (Eastbound)				SE Harrison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	149	1	0	2	65	0	0	1	5	6	0	6	18	28	0	286	
7:05 AM	3	177	3	0	3	63	0	0	1	7	2	0	4	4	21	0	288	
7:10 AM	8	127	0	0	2	56	3	0	2	9	2	0	2	9	36	0	256	
7:15 AM	2	163	8	0	13	77	0	0	4	13	1	0	4	9	18	0	312	
7:20 AM	7	144	0	0	5	68	1	0	1	10	1	0	2	8	28	0	275	
7:25 AM	3	181	2	0	2	76	0	0	2	7	1	0	1	16	36	0	327	
7:30 AM	6	136	4	0	7	62	0	1	1	12	3	0	2	18	29	0	281	
7:35 AM	4	182	10	0	11	85	3	0	0	9	5	0	2	7	21	0	339	
7:40 AM	6	118	4	0	7	64	2	0	0	7	5	0	3	10	26	0	252	
7:45 AM	3	165	7	0	4	82	0	0	3	13	8	0	8	10	28	0	331	
7:50 AM	3	107	4	0	11	73	1	0	3	9	2	0	7	29	22	0	271	
7:55 AM	5	144	5	0	6	78	1	0	0	6	3	0	1	15	17	0	281	3499
8:00 AM	5	110	5	0	10	74	2	0	1	11	4	0	2	19	21	0	264	3477
8:05 AM	6	149	4	0	4	64	3	0	1	8	0	0	5	14	19	0	277	3466
8:10 AM	6	156	1	0	8	61	0	0	2	13	6	0	1	20	25	0	299	3509
8:15 AM	3	144	5	0	9	46	1	0	2	11	6	0	4	11	14	0	256	3453
8:20 AM	9	118	2	0	9	58	2	0	2	16	8	0	2	24	23	0	273	3451
8:25 AM	3	161	6	0	5	83	0	0	2	7	5	0	3	15	18	0	308	3432
8:30 AM	5	126	4	0	5	53	2	0	3	11	3	0	3	18	17	0	250	3401
8:35 AM	6	156	6	0	6	66	0	0	0	10	3	0	2	13	15	0	283	3345
8:40 AM	5	98	7	0	6	57	2	0	0	14	4	0	7	14	19	0	233	3326
8:45 AM	6	121	5	0	4	62	4	0	0	11	3	0	3	17	15	0	251	3246
8:50 AM	8	85	9	0	12	39	2	0	1	25	5	0	5	24	17	0	232	3207
8:55 AM	9	119	6	0	11	66	0	0	0	5	3	0	4	10	14	0	247	3173
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	52	1996	64	0	80	896	12	4	12	112	36	0	20	164	344	0	3792	
Heavy Trucks	4	48	4		0	52	0		0	16	4		0	20	8		156	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** Milwaukie Expy -- SE Harrison St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894502  
**DATE:** Thu, Feb 7 2019

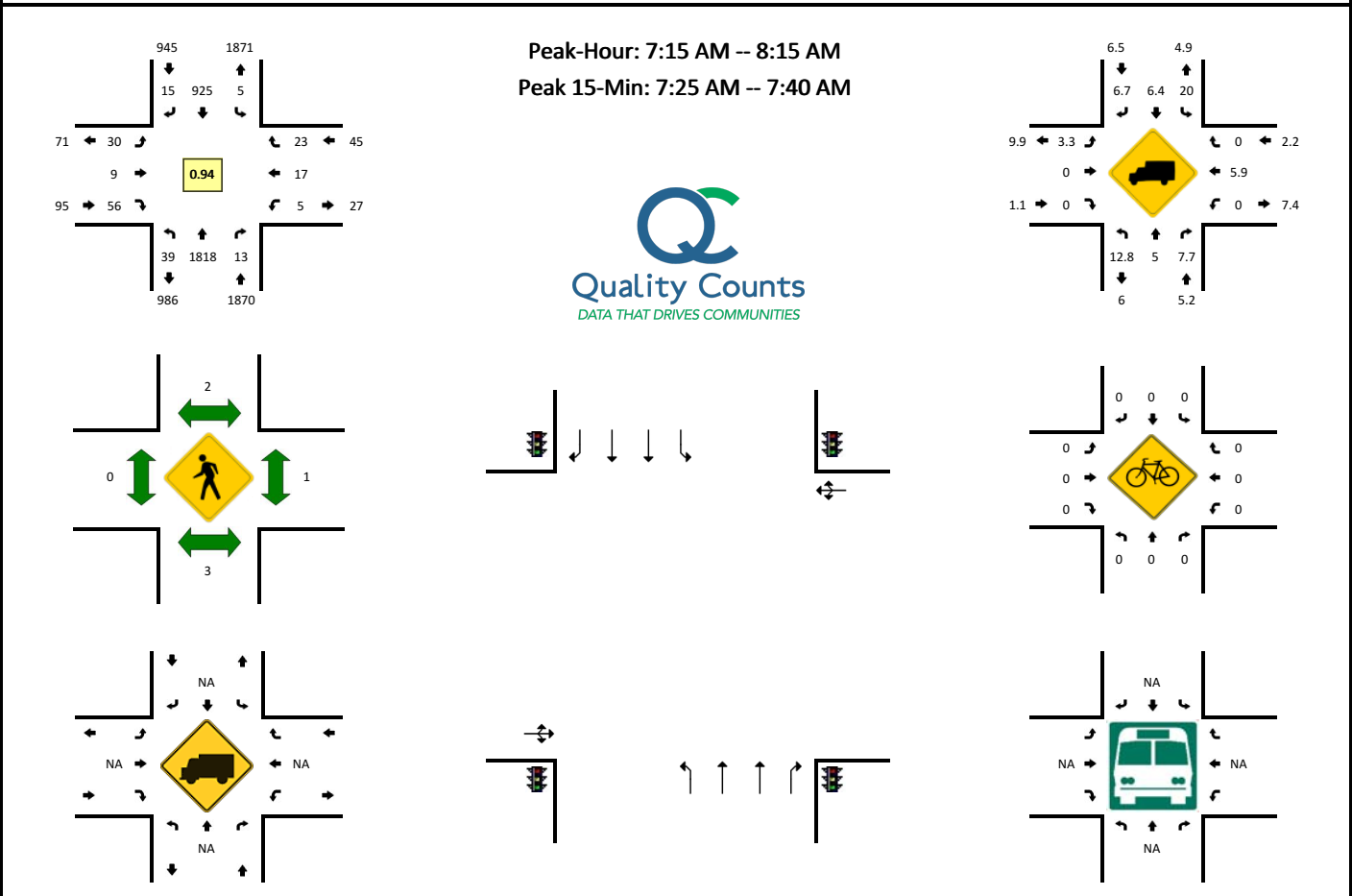


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Harrison St (Eastbound)				SE Harrison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	8	107	5	0	18	120	2	0	0	25	3	0	8	10	10	0	316	
4:05 PM	5	105	1	0	18	118	2	0	2	23	13	0	2	8	9	0	306	
4:10 PM	4	139	10	0	19	143	1	0	0	18	3	0	1	13	17	0	368	
4:15 PM	7	94	3	0	15	117	1	0	0	25	6	0	1	16	13	0	298	
4:20 PM	4	115	9	0	8	144	2	0	0	16	4	0	4	17	3	0	326	
4:25 PM	4	120	9	0	32	155	2	0	1	17	6	0	5	10	14	0	375	
4:30 PM	6	99	4	0	26	128	0	0	0	21	4	0	6	16	10	0	320	
4:35 PM	3	105	3	0	27	128	3	0	0	16	5	0	8	18	17	0	333	
4:40 PM	4	147	9	0	7	182	2	0	0	0	2	0	5	5	3	0	366	
4:45 PM	4	105	4	0	12	155	2	0	1	18	4	0	2	8	7	0	322	
4:50 PM	4	103	3	0	23	131	3	0	0	36	8	0	8	23	14	0	356	
4:55 PM	3	105	3	0	32	149	2	0	0	11	6	0	7	19	22	0	359	4045
5:00 PM	3	147	5	0	17	140	3	0	0	14	1	0	4	20	13	0	367	4096
5:05 PM	7	125	12	0	17	113	2	0	1	39	5	0	3	15	12	0	351	4141
5:10 PM	5	108	8	0	30	140	3	0	1	29	5	0	6	17	13	0	365	4138
5:15 PM	5	126	7	0	26	153	2	0	1	16	7	0	7	12	16	0	378	4218
5:20 PM	6	126	4	0	25	140	1	0	0	25	1	0	2	13	14	0	357	4249
5:25 PM	6	111	3	0	24	119	4	0	0	30	6	0	3	16	16	0	338	4212
5:30 PM	6	117	4	0	39	153	1	0	0	16	4	0	6	19	12	0	377	4269
5:35 PM	8	113	3	0	27	136	5	0	1	19	6	0	1	11	11	0	341	4277
5:40 PM	7	81	5	0	25	128	3	0	1	26	7	0	7	13	18	0	321	4232
5:45 PM	9	73	7	0	32	148	3	0	0	14	6	0	4	10	10	0	316	4226
5:50 PM	7	101	5	0	24	145	0	0	0	13	6	0	7	12	11	0	331	4201
5:55 PM	6	71	5	0	24	110	1	0	0	21	6	0	4	22	11	0	281	4123
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	64	1440	76	0	324	1732	24	0	8	280	52	0	60	168	172	0	4400	
Heavy Trucks	12	36	4		0	52	0		0	12	8		0	4	0		128	
Pedestrians		16				12				4				0			32	
Bicycles	0	0	1		0	0	0		0	1	0		0	0	0		2	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** Milwaukie Expy -- SE Monroe St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894509  
**DATE:** Thu, Feb 7 2019

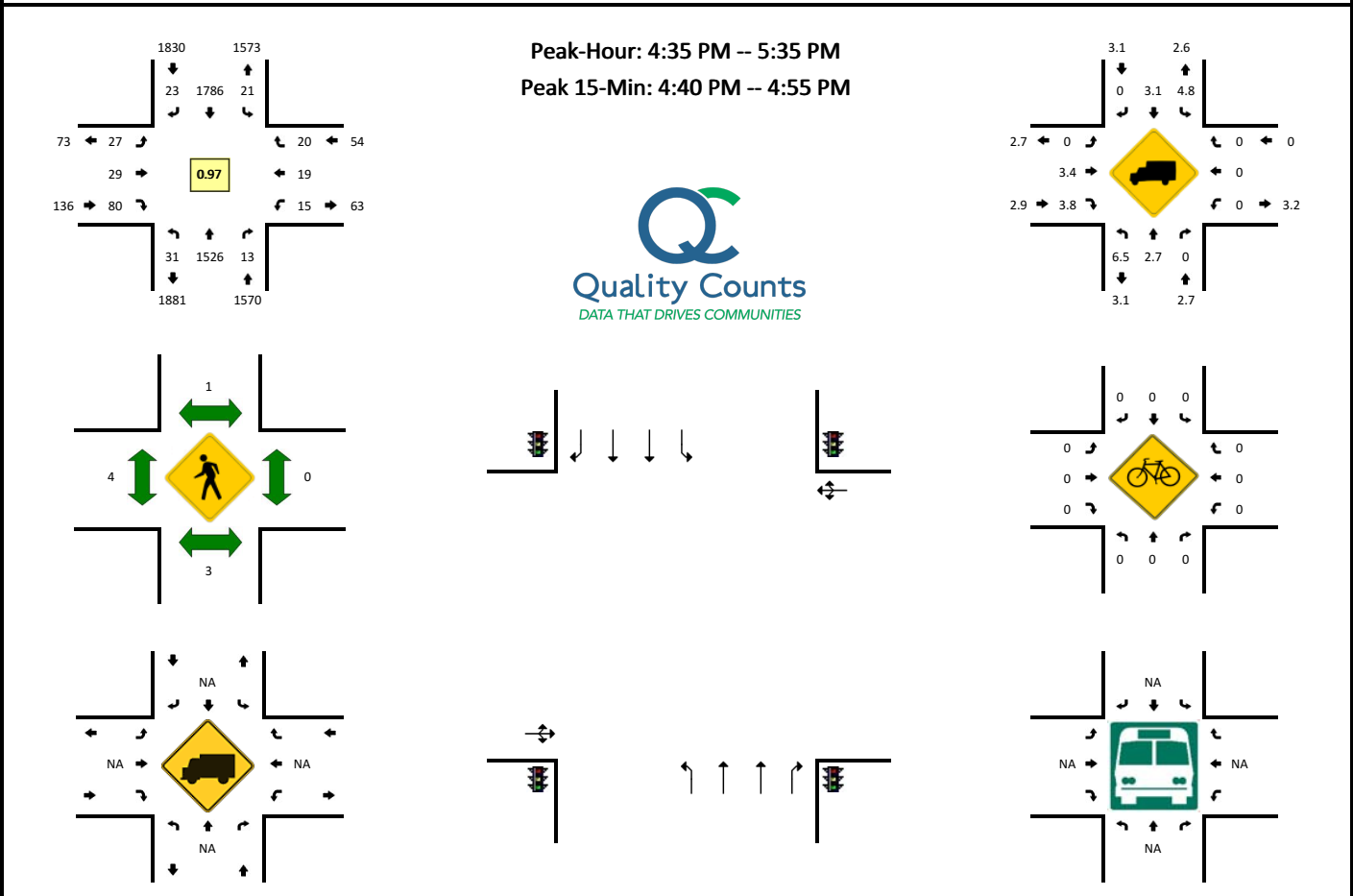


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Monroe St (Eastbound)				SE Monroe St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	158	0	0	0	72	1	0	4	2	1	0	0	1	2	0	243	
7:05 AM	2	167	0	0	0	70	3	0	0	0	6	0	0	1	3	0	252	
7:10 AM	2	131	1	0	0	63	1	0	3	1	9	0	0	1	0	0	212	
7:15 AM	0	172	0	0	1	79	1	0	3	1	1	0	1	0	1	0	260	
7:20 AM	2	150	0	0	0	67	0	0	1	0	5	0	0	0	2	0	227	
7:25 AM	2	171	1	0	1	78	3	0	1	1	1	0	0	0	2	0	261	
7:30 AM	4	158	2	0	1	61	1	0	1	0	0	0	1	3	2	0	234	
7:35 AM	1	192	1	0	0	90	1	0	1	0	2	0	0	0	2	0	290	
7:40 AM	2	124	2	0	0	77	1	0	4	0	2	0	0	3	2	0	217	
7:45 AM	5	161	1	0	0	93	1	0	1	2	3	0	0	0	1	0	268	
7:50 AM	2	117	2	0	0	82	1	0	1	0	3	0	0	1	5	0	214	
7:55 AM	5	149	1	0	0	82	1	0	4	1	8	0	1	4	1	0	257	2935
8:00 AM	4	124	2	0	1	85	0	0	7	0	9	0	0	2	1	0	235	2927
8:05 AM	4	154	0	0	1	69	3	0	5	4	14	0	0	1	0	0	255	2930
8:10 AM	8	146	1	0	0	62	2	0	1	0	8	0	2	3	4	0	237	2955
8:15 AM	8	154	1	0	0	60	1	0	1	3	10	0	1	2	0	0	241	2936
8:20 AM	7	138	0	0	0	68	1	0	2	2	8	0	0	1	1	0	228	2937
8:25 AM	4	153	0	0	0	90	0	0	0	2	4	0	0	1	2	0	256	2932
8:30 AM	4	142	0	0	0	52	1	0	1	0	0	0	1	1	0	0	202	2900
8:35 AM	1	156	3	0	0	77	0	0	0	1	3	0	2	1	0	0	244	2854
8:40 AM	2	112	2	0	0	60	1	0	2	1	1	0	2	2	1	0	186	2823
8:45 AM	7	127	2	0	0	74	0	0	0	0	1	0	0	1	1	0	213	2768
8:50 AM	3	103	2	0	1	44	3	0	1	4	3	0	0	2	1	0	167	2721
8:55 AM	1	132	1	0	0	76	1	0	1	0	3	0	2	0	0	0	217	2681
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	28	2084	16	0	8	916	20	0	12	4	12	0	4	12	24	0	3140	
Heavy Trucks	16	52	4		0	56	0		0	0	0		0	0	0		128	
Pedestrians		4				4				0				4			12	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** Milwaukie Expy -- SE Monroe St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894510  
**DATE:** Thu, Feb 7 2019

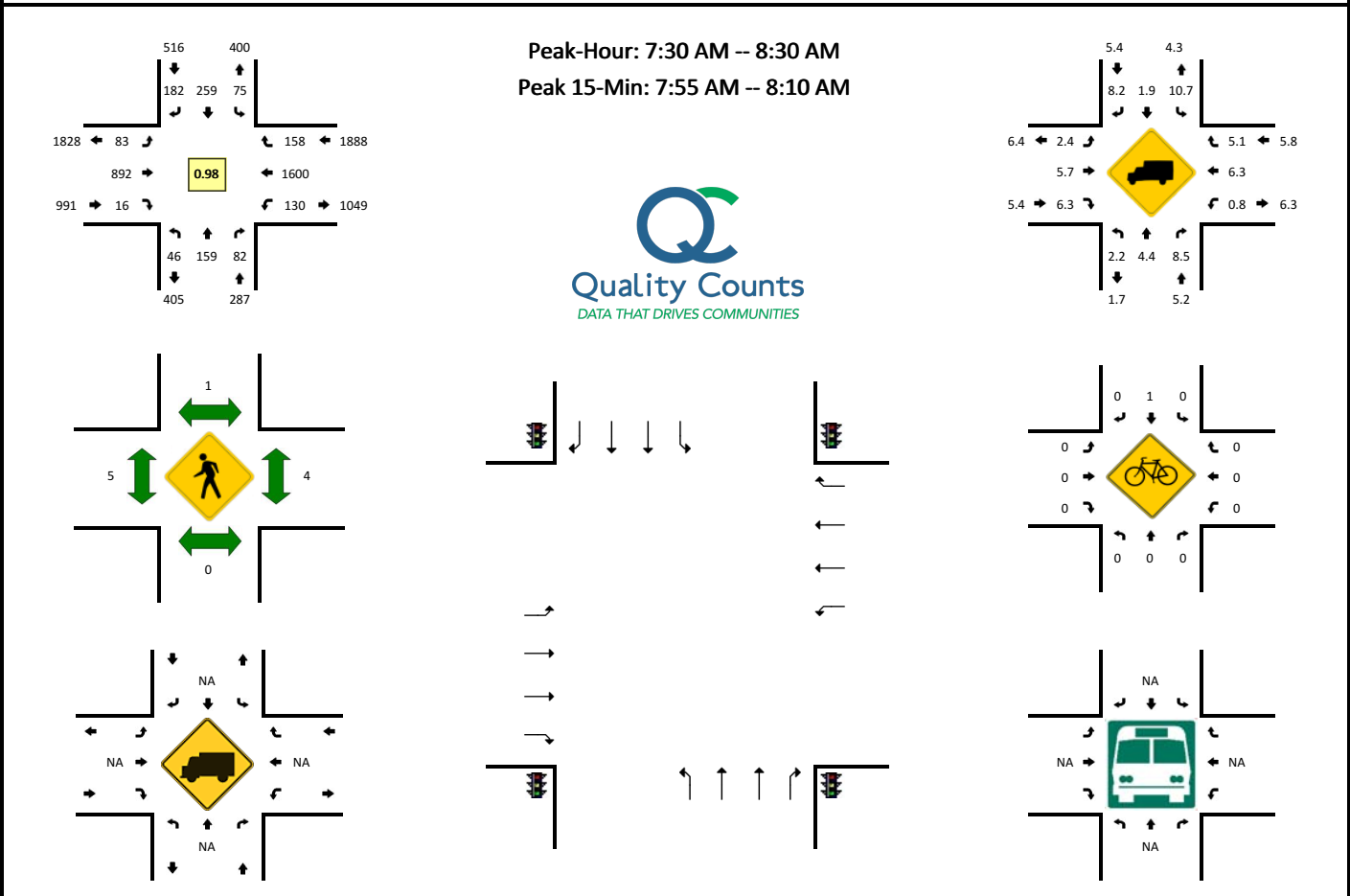


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Monroe St (Eastbound)				SE Monroe St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	111	1	0	0	134	3	0	4	4	6	0	0	3	1	0	269	
4:05 PM	3	132	0	0	1	127	2	0	0	1	7	0	1	1	1	0	276	
4:10 PM	2	132	0	0	0	154	1	0	3	1	8	0	0	0	1	0	302	
4:15 PM	6	99	1	0	1	127	0	0	3	2	8	0	0	1	1	0	249	
4:20 PM	0	147	0	0	0	150	2	1	4	1	3	0	0	1	2	0	311	
4:25 PM	2	118	2	0	0	163	2	0	0	3	2	0	1	2	1	0	296	
4:30 PM	3	95	1	0	0	124	1	0	2	1	9	0	5	3	1	0	245	
4:35 PM	1	124	0	0	2	150	2	0	4	3	3	0	0	1	0	0	290	
4:40 PM	5	149	3	0	2	186	1	0	3	1	4	0	2	1	2	0	359	
4:45 PM	3	101	1	0	2	152	1	0	4	2	5	0	1	3	1	0	276	
4:50 PM	2	118	1	0	5	147	1	0	1	2	8	0	2	4	2	0	293	
4:55 PM	0	123	3	0	0	157	0	0	2	0	4	0	2	1	3	0	295	3461
5:00 PM	2	142	0	0	1	140	4	0	1	4	5	0	0	0	1	0	300	3492
5:05 PM	3	123	0	0	1	123	3	0	5	2	17	0	3	2	4	0	286	3502
5:10 PM	3	146	0	0	1	144	1	0	1	4	5	0	2	1	1	0	309	3509
5:15 PM	2	121	1	0	0	167	3	0	1	3	6	0	2	3	0	0	309	3569
5:20 PM	5	125	3	0	2	124	3	0	2	4	16	0	0	1	2	0	287	3545
5:25 PM	4	138	0	0	2	141	1	0	2	2	5	0	1	1	2	0	299	3548
5:30 PM	1	116	1	0	3	155	3	0	1	2	2	0	0	1	2	0	287	3590
5:35 PM	3	108	0	0	0	133	0	0	1	2	8	0	1	2	0	0	258	3558
5:40 PM	3	95	1	0	1	150	2	0	2	1	6	0	1	3	3	0	268	3467
5:45 PM	2	109	2	0	0	150	3	0	2	4	6	0	1	2	2	0	283	3474
5:50 PM	3	87	0	0	1	139	3	0	2	0	7	0	1	2	1	0	246	3427
5:55 PM	3	87	0	0	2	143	2	0	0	1	6	0	0	2	1	0	247	3379
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	40	1472	20	0	36	1940	12	0	32	20	68	0	20	32	20	0	3712	
Heavy Trucks	0	36	0	0	0	64	0	0	0	4	12	0	0	0	0	0	116	
Pedestrians		0				4				4				0			8	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** SE Oak St -- Milwaukie Expy  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894511  
**DATE:** Thu, Feb 7 2019

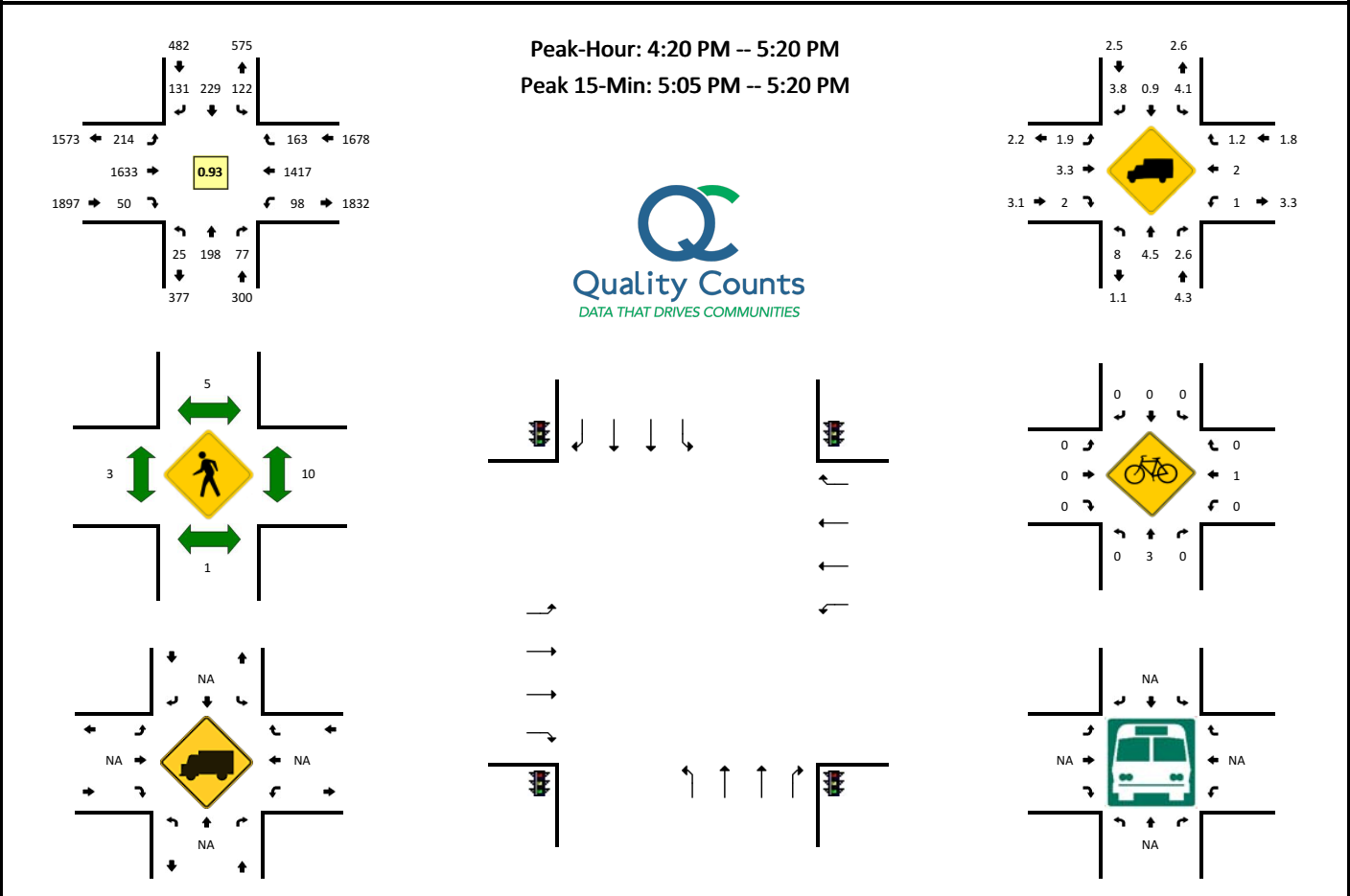


5-Min Count Period Beginning At	SE Oak St (Northbound)				SE Oak St (Southbound)				Milwaukie Expy (Eastbound)				Milwaukie Expy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	9	3	0	6	4	15	0	2	70	0	0	0	142	11	0	266	
7:05 AM	10	6	4	0	4	7	14	0	2	66	0	0	1	136	12	0	262	
7:10 AM	6	7	1	0	3	9	8	0	8	72	1	0	2	137	7	0	261	
7:15 AM	5	7	3	0	6	10	10	0	9	66	3	0	1	143	10	0	273	
7:20 AM	11	5	2	0	5	15	21	0	7	61	0	0	4	133	10	0	274	
7:25 AM	6	7	3	0	6	7	20	0	4	74	1	0	6	146	12	0	292	
7:30 AM	6	14	5	0	10	21	16	0	5	58	1	0	8	144	9	0	297	
7:35 AM	3	13	9	0	5	12	13	0	3	86	3	0	6	170	19	0	342	
7:40 AM	7	8	6	0	3	15	13	0	2	70	1	0	17	114	14	0	270	
7:45 AM	2	9	6	0	5	18	16	0	12	86	2	0	10	135	13	0	314	
7:50 AM	6	16	8	0	9	21	18	0	7	74	0	0	16	105	10	0	290	
7:55 AM	2	17	5	0	7	22	16	0	7	88	2	0	9	128	12	0	315	3456
8:00 AM	7	18	9	0	7	33	12	0	5	67	1	0	20	120	13	0	312	3502
8:05 AM	4	10	12	0	5	10	14	0	13	79	1	0	11	145	11	0	315	3555
8:10 AM	1	17	3	0	5	25	11	0	4	64	0	0	9	141	14	0	294	3588
8:15 AM	4	12	6	0	6	20	19	0	9	68	2	0	8	132	18	0	304	3619
8:20 AM	2	12	8	0	6	34	20	0	8	64	1	0	9	141	9	0	314	3659
8:25 AM	2	13	5	0	7	28	14	0	8	88	2	0	7	125	16	0	315	3682
8:30 AM	7	26	5	0	10	24	14	0	4	46	0	0	13	131	4	0	284	3669
8:35 AM	3	22	11	0	3	9	19	0	8	77	0	0	6	129	6	0	293	3620
8:40 AM	4	22	8	0	10	11	11	0	3	57	1	0	6	113	13	0	259	3609
8:45 AM	4	4	2	0	8	12	13	0	8	70	2	0	7	107	9	0	246	3541
8:50 AM	3	21	3	0	10	6	14	0	4	41	0	0	5	107	10	0	224	3475
8:55 AM	1	4	6	0	5	8	12	0	8	71	0	0	6	108	15	0	244	3404
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	52	180	104	0	76	260	168	0	100	936	16	0	160	1572	144	0	3768	
Heavy Trucks	4	12	4		16	12	8		4	56	0		0	88	4		208	
Pedestrians		0				4				0				12			16	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** SE Oak St -- Milwaukie Expy  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894512  
**DATE:** Thu, Feb 7 2019

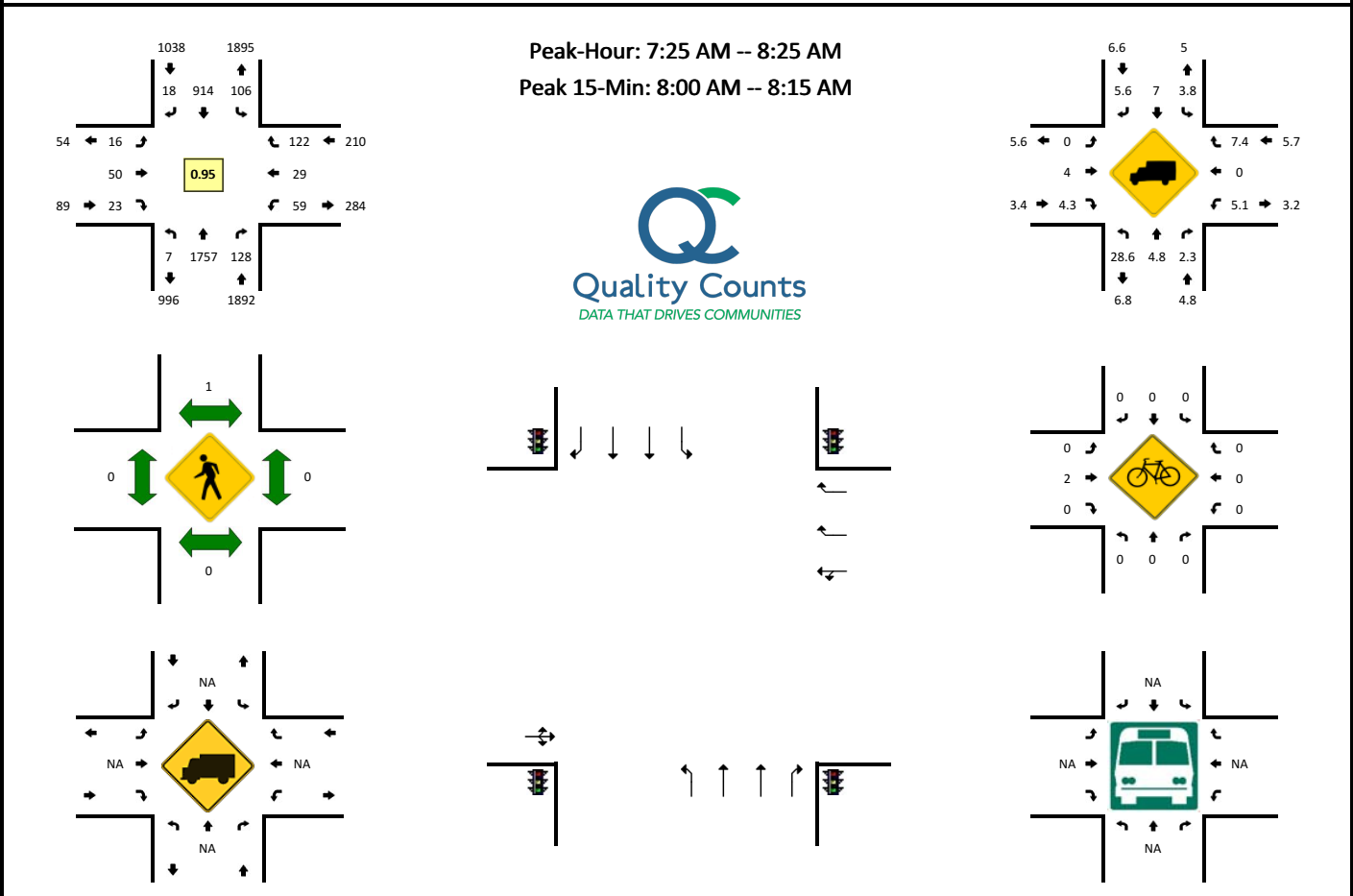


5-Min Count Period Beginning At	SE Oak St (Northbound)				SE Oak St (Southbound)				Milwaukie Expy (Eastbound)				Milwaukie Expy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	20	9	0	13	12	8	0	17	107	4	0	15	108	15	0	328	
4:05 PM	5	19	9	0	10	11	10	0	17	111	3	0	10	120	16	0	341	
4:10 PM	5	23	3	0	12	15	15	0	22	147	4	0	8	114	17	0	385	
4:15 PM	3	34	5	0	13	26	9	0	11	105	3	0	9	90	14	0	322	
4:20 PM	3	14	4	0	5	11	13	0	12	131	2	0	7	144	12	0	358	
4:25 PM	0	22	0	0	7	18	8	0	20	152	2	0	8	112	17	0	366	
4:30 PM	9	27	8	0	14	26	11	0	20	124	4	0	8	90	11	0	352	
4:35 PM	3	12	3	0	8	22	10	0	6	124	6	0	11	117	10	0	332	
4:40 PM	1	8	12	0	6	23	5	0	15	180	3	0	6	129	10	0	398	
4:45 PM	0	18	10	0	9	19	9	0	24	130	6	0	4	88	15	0	332	
4:50 PM	3	14	3	0	15	18	12	0	20	137	5	0	15	117	10	0	369	
4:55 PM	1	13	9	0	11	12	6	0	19	131	8	0	2	138	16	0	366	4249
5:00 PM	0	15	2	0	12	18	10	0	22	116	0	0	6	105	12	0	318	4239
5:05 PM	3	25	11	0	17	28	12	0	17	123	6	0	6	113	14	0	375	4273
5:10 PM	0	15	8	0	15	17	18	0	14	128	5	0	16	134	14	0	384	4272
5:15 PM	2	15	7	0	3	17	17	0	25	157	3	0	9	130	22	0	407	4357
5:20 PM	2	31	6	0	14	41	12	0	15	109	7	0	10	92	12	0	351	4350
5:25 PM	1	15	6	0	9	20	8	0	11	147	3	0	10	124	7	0	361	4345
5:30 PM	2	12	3	0	8	17	16	0	12	126	5	0	3	87	10	0	301	4294
5:35 PM	1	22	6	0	15	24	16	0	14	135	2	0	8	82	11	0	336	4298
5:40 PM	1	12	3	0	8	14	16	0	18	118	4	0	13	88	16	1	312	4212
5:45 PM	3	15	5	0	5	11	10	0	13	143	4	0	1	96	8	0	314	4194
5:50 PM	1	19	4	0	15	15	7	0	21	135	6	0	4	66	11	0	304	4129
5:55 PM	2	13	4	0	8	16	11	0	14	124	8	0	9	88	12	0	309	4072
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	20	220	104	0	140	248	188	0	224	1632	56	0	124	1508	200	0	4664	
Heavy Trucks	0	4	8		4	0	12		4	40	0		0	24	4		100	
Pedestrians		0				0				4				16			20	
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** Milwaukie Expy -- SE Edison St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894517  
**DATE:** Thu, Feb 7 2019



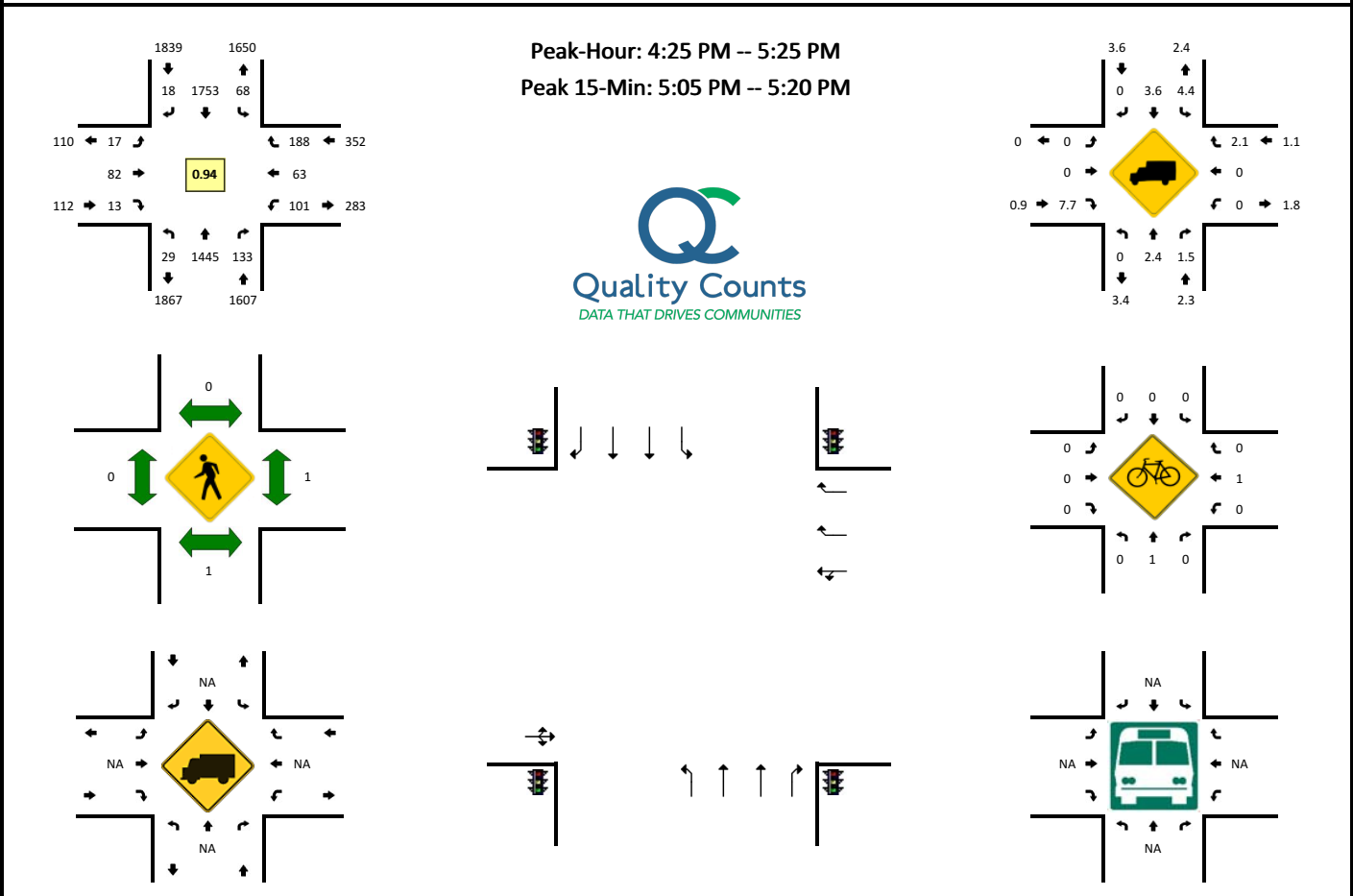
5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Edison St (Eastbound)				SE Edison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	168	7	0	9	65	0	0	0	2	2	0	2	5	2	0	262	
7:05 AM	0	134	2	0	9	72	1	0	1	3	1	0	0	4	4	0	231	
7:10 AM	1	156	6	0	5	63	0	0	0	0	0	0	2	1	3	0	237	
7:15 AM	1	140	8	0	3	70	1	0	2	2	0	0	2	1	4	0	234	
7:20 AM	0	155	5	0	7	61	1	0	1	4	5	0	3	3	13	0	258	
7:25 AM	1	136	7	0	11	77	0	0	2	2	3	0	7	3	15	0	264	
7:30 AM	0	176	14	0	2	65	0	0	1	4	4	0	5	1	6	0	278	
7:35 AM	0	123	11	0	8	79	1	0	3	4	4	0	3	2	18	0	256	
7:40 AM	0	150	11	0	9	72	1	0	3	0	1	0	3	1	11	0	262	
7:45 AM	2	126	14	0	9	97	0	0	1	5	0	0	5	5	10	0	274	
7:50 AM	1	137	10	0	9	83	2	0	1	3	2	0	6	2	7	0	263	
7:55 AM	0	122	13	0	15	75	2	0	0	10	2	0	6	2	9	0	256	3075
8:00 AM	0	187	17	0	4	87	2	0	0	3	1	0	2	3	8	0	314	3127
8:05 AM	0	128	11	0	14	84	3	0	2	4	1	0	9	2	12	0	270	3166
8:10 AM	1	167	4	0	5	63	2	0	1	4	3	0	1	3	11	0	265	3194
8:15 AM	0	139	7	0	9	69	3	0	2	6	1	0	7	1	5	0	249	3209
8:20 AM	2	166	9	0	11	63	2	0	0	5	1	0	5	4	10	0	278	3229
8:25 AM	1	120	9	0	11	74	1	0	1	5	0	0	6	5	7	0	240	3205
8:30 AM	0	157	13	0	7	59	3	0	2	2	3	0	2	0	5	0	253	3180
8:35 AM	0	102	11	0	11	73	0	0	1	3	4	0	2	1	7	0	215	3139
8:40 AM	1	143	12	0	4	76	1	0	0	2	1	0	1	0	4	0	245	3122
8:45 AM	0	110	4	0	4	65	0	1	2	5	2	0	8	4	3	0	208	3056
8:50 AM	2	140	10	0	9	59	1	0	0	2	1	0	2	3	2	0	231	3024
8:55 AM	0	106	14	0	8	70	0	0	0	5	0	0	6	1	4	0	214	2982
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	1928	128	0	92	936	28	0	12	44	20	0	48	32	124	0	3396	
Heavy Trucks	0	76	0		8	72	4		0	0	4		8	0	8		180	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:



**LOCATION:** Milwaukie Expy -- SE Edison St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894518  
**DATE:** Thu, Feb 7 2019

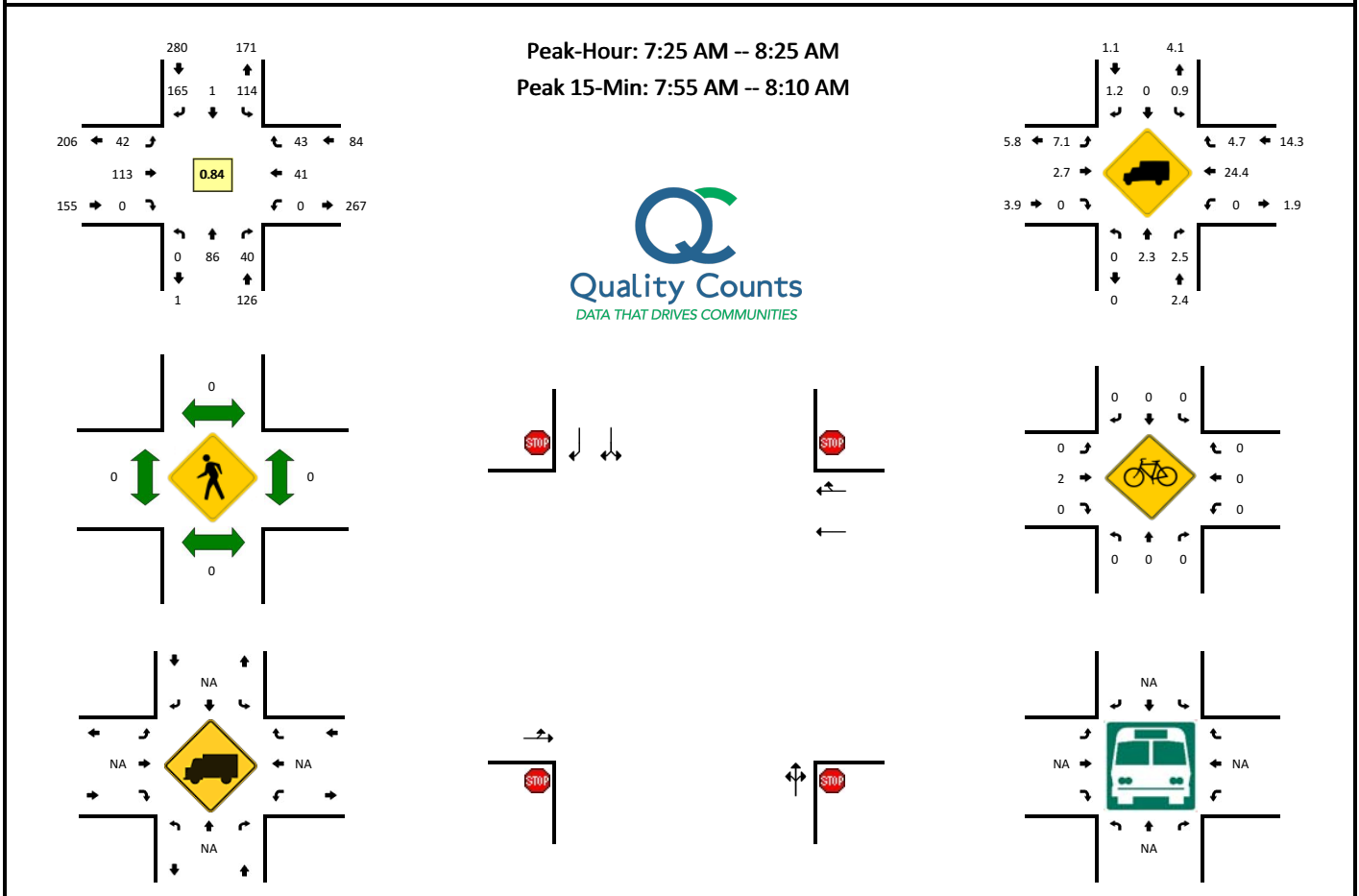


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Edison St (Eastbound)				SE Edison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	124	12	0	10	143	1	0	0	7	0	0	5	3	19	0	326	
4:05 PM	4	107	9	0	3	113	1	0	1	3	0	0	7	3	20	0	271	
4:10 PM	3	108	12	0	4	128	3	0	0	5	2	0	9	14	15	0	303	
4:15 PM	0	125	10	0	5	157	1	0	2	10	2	0	7	6	13	0	338	
4:20 PM	3	138	12	0	1	118	0	0	2	7	2	0	8	6	7	0	304	
4:25 PM	1	96	10	0	8	145	1	0	0	17	2	0	8	4	15	0	307	
4:30 PM	5	108	14	0	8	150	2	0	1	8	0	0	7	3	19	0	325	
4:35 PM	4	140	11	0	4	125	1	0	0	3	0	0	10	3	16	0	317	
4:40 PM	3	94	8	0	4	160	3	0	1	13	0	0	8	5	11	0	310	
4:45 PM	2	117	9	0	4	181	0	0	2	3	0	0	3	5	10	0	336	
4:50 PM	2	131	14	0	5	149	0	0	4	6	3	0	8	2	16	0	340	
4:55 PM	0	114	12	0	7	142	1	0	2	5	2	0	8	12	11	0	316	3793
5:00 PM	1	134	15	0	8	121	3	0	0	2	0	0	8	8	14	0	314	3781
5:05 PM	3	150	9	0	7	156	0	0	1	8	3	0	9	4	17	0	367	3877
5:10 PM	4	99	14	0	1	121	1	0	4	4	0	0	11	4	27	0	290	3864
5:15 PM	2	142	9	0	7	161	4	0	2	7	2	0	11	9	23	0	379	3905
5:20 PM	2	120	8	0	5	142	2	0	0	6	1	0	10	4	9	0	309	3910
5:25 PM	6	96	10	0	0	140	2	0	0	8	2	0	9	4	7	0	284	3887
5:30 PM	2	92	11	0	5	135	2	0	0	1	3	0	14	7	12	0	284	3846
5:35 PM	2	99	11	0	4	160	3	0	2	3	0	0	5	4	10	0	303	3832
5:40 PM	4	109	13	0	5	130	0	0	0	6	1	0	8	4	18	0	298	3820
5:45 PM	2	79	4	0	7	119	3	0	0	4	0	0	11	10	8	0	247	3731
5:50 PM	0	105	8	0	5	165	3	0	1	0	1	0	5	3	4	0	300	3691
5:55 PM	1	88	8	0	6	133	2	0	2	1	0	0	6	4	4	0	255	3630
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	36	1564	128	0	60	1752	20	0	28	76	20	0	124	68	268	0	4144	
Heavy Trucks	0	32	0	0	4	44	0	0	0	0	0	0	0	0	4	0	84	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** SE 37th Ave -- SE International Way  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894519  
**DATE:** Thu, Feb 7 2019

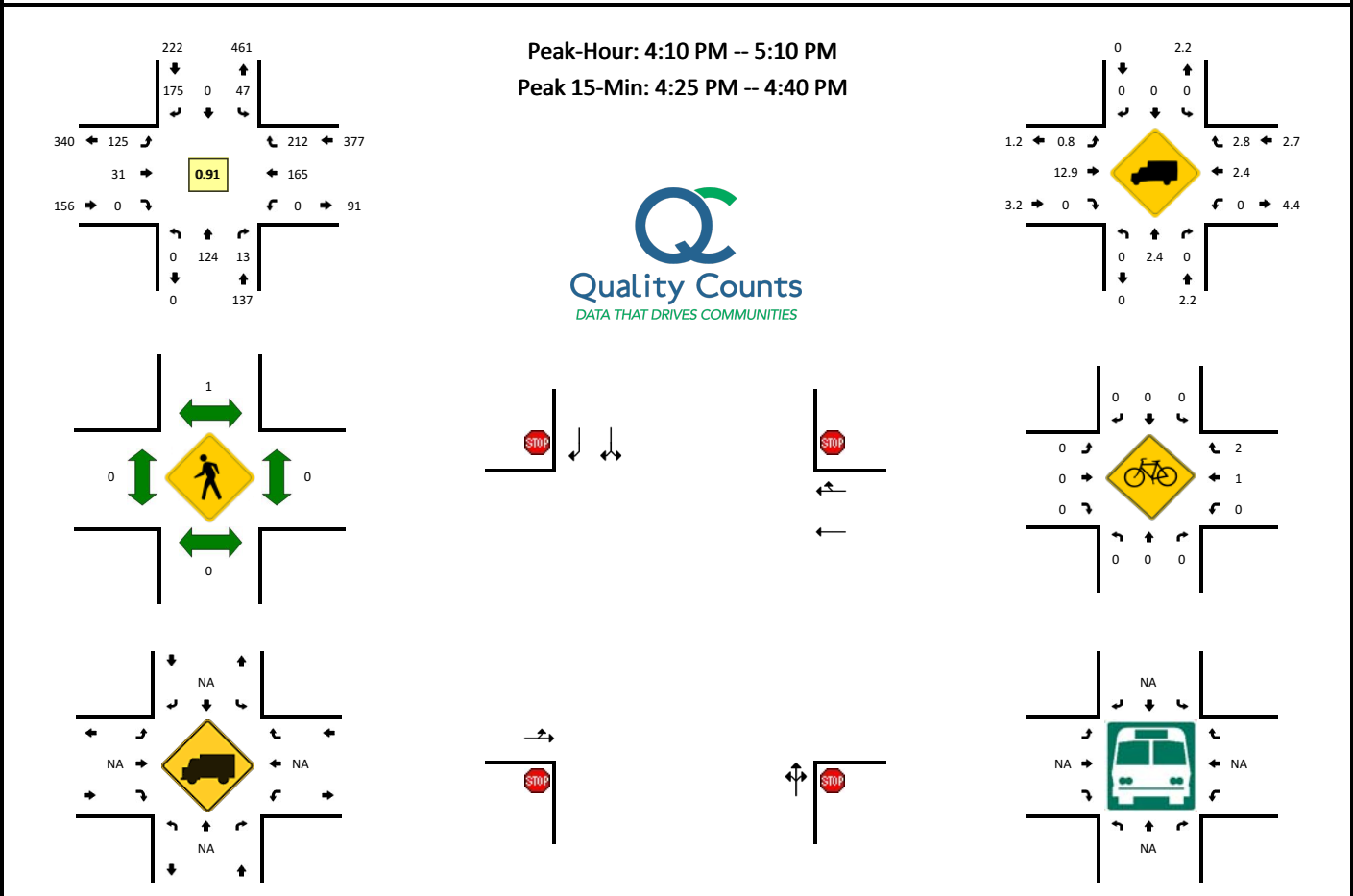


5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE International Way (Eastbound)				SE International Way (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	2	3	0	8	0	9	0	2	9	0	0	0	1	0	0	0	34	
7:05 AM	0	2	3	0	7	0	4	0	5	7	0	0	0	0	0	0	0	28	
7:10 AM	0	5	1	0	9	0	8	0	1	5	0	0	0	0	2	0	0	31	
7:15 AM	0	6	2	0	12	0	6	0	1	4	0	0	0	0	0	4	0	35	
7:20 AM	0	2	3	0	6	0	20	0	1	8	0	0	0	0	6	1	0	47	
7:25 AM	0	5	4	0	8	0	15	0	2	11	0	0	0	0	5	4	0	54	
7:30 AM	0	8	5	0	6	0	14	0	3	3	0	0	0	0	0	2	0	41	
7:35 AM	0	8	3	0	9	0	14	0	3	9	0	0	0	0	7	5	0	58	
7:40 AM	0	8	2	0	13	0	11	1	0	9	0	0	0	0	6	6	0	56	
7:45 AM	0	9	3	0	10	0	17	0	2	11	0	0	0	0	2	3	0	57	
7:50 AM	0	8	1	0	7	0	11	0	4	8	0	0	0	0	1	2	0	42	
7:55 AM	0	10	4	0	17	0	14	0	3	17	0	0	0	0	2	6	0	73	556
8:00 AM	0	9	7	0	9	0	13	0	2	10	0	0	0	0	4	3	0	57	579
8:05 AM	0	9	3	0	11	0	14	0	5	13	0	0	0	0	5	1	0	61	612
8:10 AM	0	3	1	0	7	0	17	0	5	4	0	0	0	0	0	1	0	38	619
8:15 AM	0	5	2	0	6	0	7	0	7	8	0	0	0	0	4	6	0	45	629
8:20 AM	0	4	5	0	11	0	18	0	6	10	0	0	0	0	5	4	0	63	645
8:25 AM	0	5	4	0	10	0	15	0	4	12	0	0	0	0	1	2	0	53	644
8:30 AM	0	8	4	0	7	0	5	0	2	7	0	0	0	0	3	3	0	39	642
8:35 AM	0	5	7	0	5	0	8	0	4	10	0	0	0	0	1	4	0	44	628
8:40 AM	0	8	4	0	9	0	5	0	1	5	0	0	0	0	3	0	0	35	607
8:45 AM	0	3	2	0	7	0	9	0	5	4	0	0	0	0	3	4	0	37	587
8:50 AM	0	7	3	0	10	0	9	0	2	10	0	0	0	0	3	4	0	48	593
8:55 AM	0	8	5	0	9	0	8	0	1	12	0	0	0	0	2	4	0	49	569
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	0	112	56	0	148	0	164	0	40	160	0	0	0	44	40	0	0	764	
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	20	4			28	
Pedestrians		0				0				0				0				0	
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0			1	
Railroad																			
Stopped Buses																			

Comments:

**LOCATION:** SE 37th Ave -- SE International Way  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894520  
**DATE:** Thu, Feb 7 2019

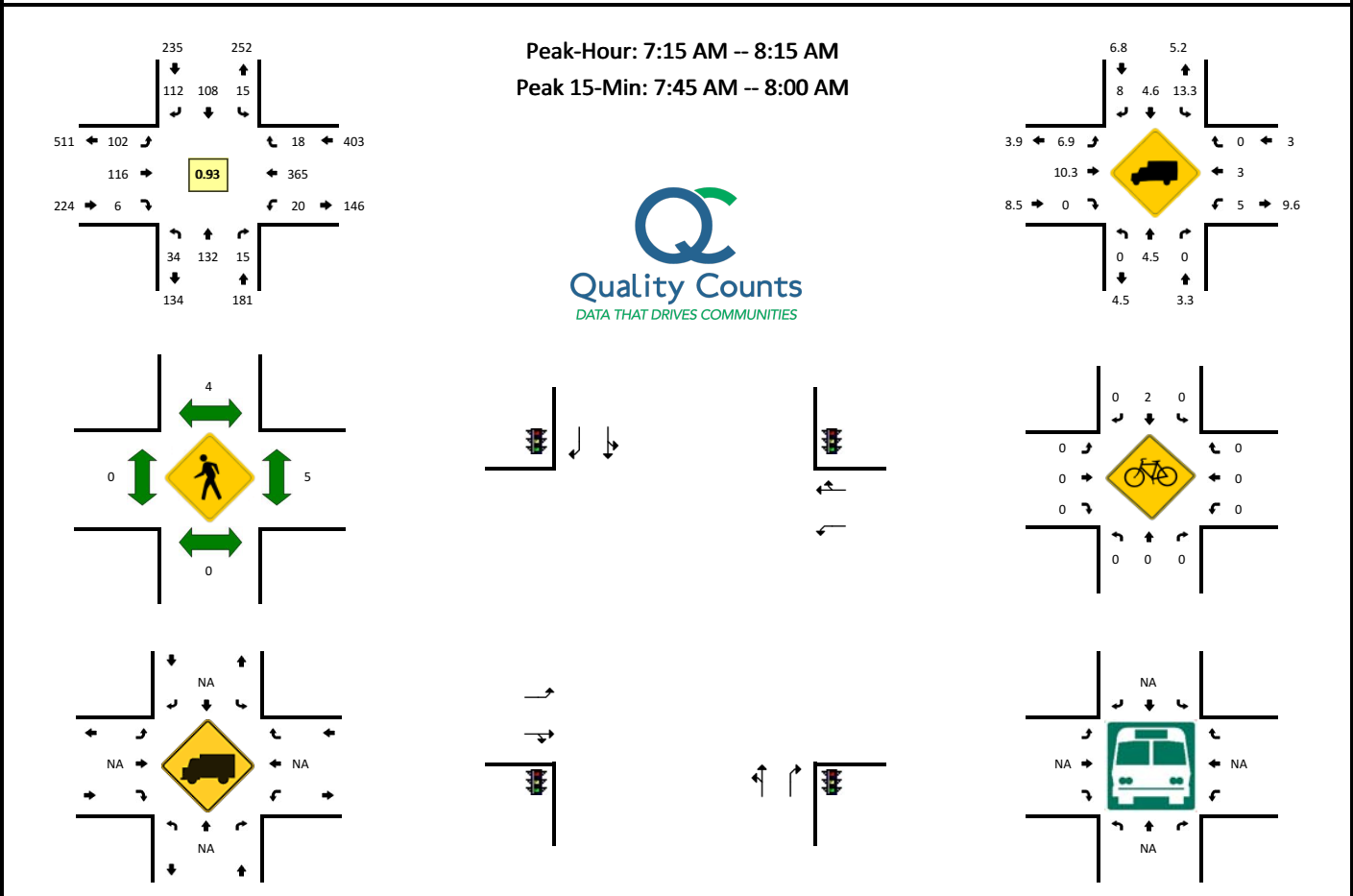


5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE International Way (Eastbound)				SE International Way (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	10	2	0	2	0	13	0	11	6	0	0	0	18	14	0	76	
4:05 PM	0	8	1	0	3	0	15	0	4	2	0	0	0	14	18	0	65	
4:10 PM	0	10	2	0	6	0	19	0	9	3	0	0	0	16	23	0	88	
4:15 PM	0	8	1	0	4	0	15	0	11	4	0	0	0	14	21	0	78	
4:20 PM	0	13	0	0	3	0	13	0	6	1	0	0	0	7	12	0	55	
4:25 PM	0	10	0	0	6	0	17	0	22	4	0	0	0	10	15	0	84	
4:30 PM	0	13	1	0	3	0	12	0	16	0	0	0	0	18	22	0	85	
4:35 PM	0	10	1	0	5	0	15	0	5	2	0	0	0	17	21	0	76	
4:40 PM	0	8	2	0	3	0	10	0	14	1	0	0	0	9	14	0	61	
4:45 PM	0	7	2	0	5	0	12	0	8	1	0	0	0	8	6	0	49	
4:50 PM	0	12	2	0	3	0	20	0	9	2	0	0	0	10	18	0	76	
4:55 PM	0	11	0	0	2	0	14	0	7	5	0	0	0	13	10	0	62	855
5:00 PM	0	14	2	0	3	0	16	0	6	5	0	0	0	20	22	0	88	867
5:05 PM	0	8	0	0	4	0	12	0	12	3	0	0	0	23	28	0	90	892
5:10 PM	0	14	0	0	3	0	20	0	1	1	0	0	0	16	18	0	73	877
5:15 PM	0	9	0	0	1	0	23	0	14	3	0	0	0	19	13	0	82	881
5:20 PM	0	8	0	0	5	0	19	0	9	2	0	0	0	4	5	0	52	878
5:25 PM	0	10	0	0	0	0	17	0	7	1	0	0	0	4	8	0	47	841
5:30 PM	0	10	1	0	1	0	21	0	5	1	0	0	0	9	5	0	53	809
5:35 PM	0	10	0	0	2	0	19	0	5	1	0	0	0	5	16	0	58	791
5:40 PM	0	11	3	0	0	0	15	0	7	4	0	0	0	11	5	0	56	786
5:45 PM	0	5	0	0	2	0	18	0	8	2	0	0	0	9	7	0	51	788
5:50 PM	0	6	1	0	2	0	11	0	2	4	0	0	0	4	3	0	33	745
5:55 PM	0	9	0	0	6	0	9	0	5	2	0	0	0	5	5	0	41	724
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	132	8	0	56	0	176	0	172	24	0	0	0	180	232	0	980	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	12	4	0	16	
Pedestrians		0				4				0				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** SE 32nd Ave -- SE Harrison St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894503  
**DATE:** Thu, Feb 7 2019

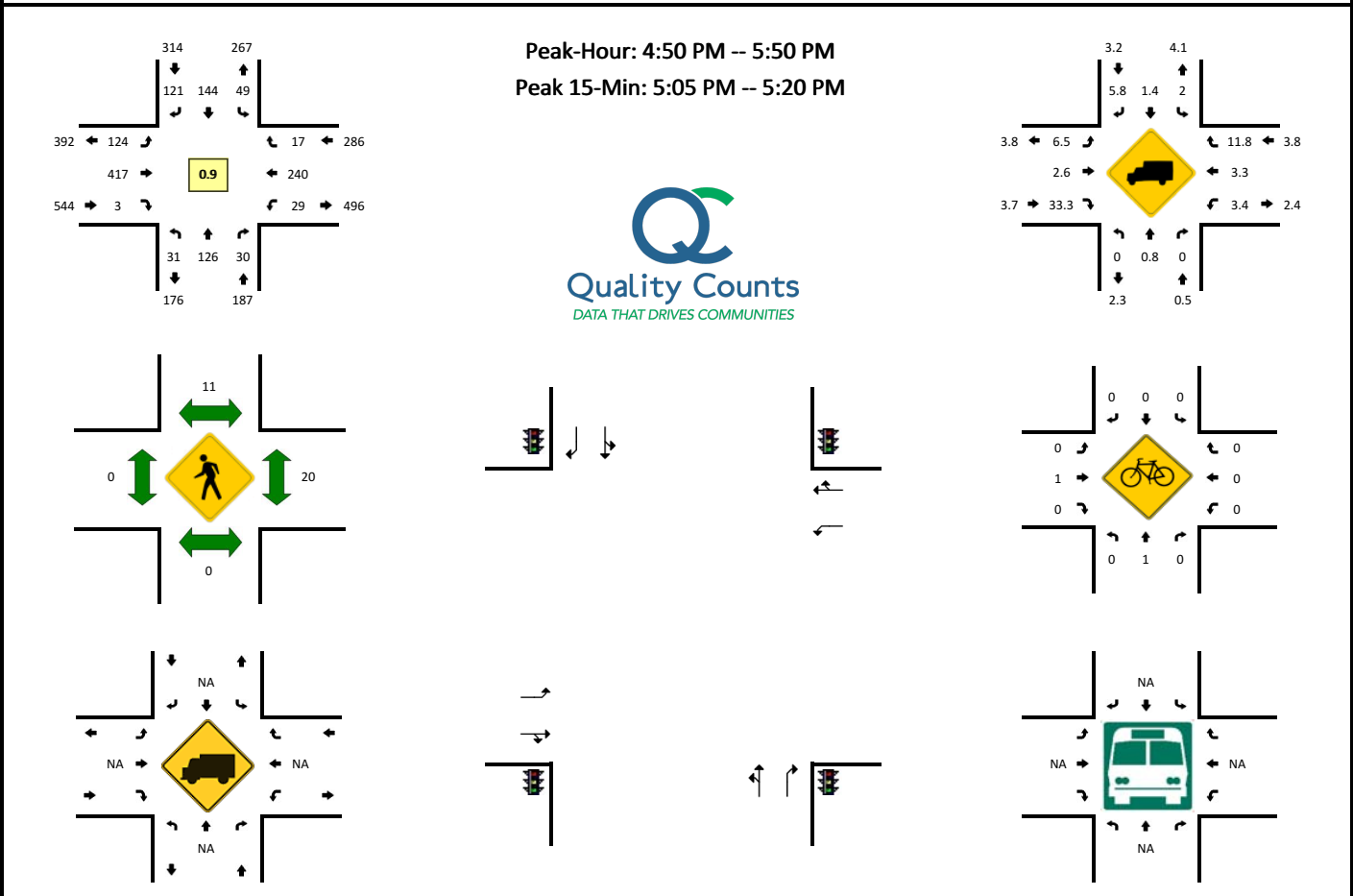


5-Min Count Period Beginning At	SE 32nd Ave (Northbound)				SE 32nd Ave (Southbound)				SE Harrison St (Eastbound)				SE Harrison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	6	1	0	2	4	9	0	6	4	0	0	1	28	1	0	66	
7:05 AM	8	6	2	0	1	4	8	0	5	7	0	0	0	17	1	0	59	
7:10 AM	6	8	0	0	1	4	4	0	2	8	0	0	1	31	2	0	67	
7:15 AM	3	14	2	0	0	15	13	0	10	14	1	0	2	34	2	0	110	
7:20 AM	2	8	1	0	3	7	7	0	7	3	1	0	2	23	1	0	65	
7:25 AM	2	4	0	0	2	11	7	0	4	9	0	0	3	41	2	0	85	
7:30 AM	4	12	1	0	2	6	10	0	6	6	1	0	1	29	3	0	81	
7:35 AM	2	16	1	0	2	3	10	0	12	16	0	0	1	32	0	0	95	
7:40 AM	0	13	0	0	0	12	5	0	5	7	2	0	1	30	3	0	78	
7:45 AM	4	10	1	0	2	9	15	0	12	11	0	0	3	28	1	0	96	
7:50 AM	3	7	2	0	1	9	11	0	11	8	0	0	1	36	3	0	92	
7:55 AM	2	16	0	0	1	15	9	0	7	6	0	0	2	32	1	0	91	985
8:00 AM	4	11	1	0	1	7	7	0	8	13	0	0	0	18	0	0	70	989
8:05 AM	4	8	3	0	1	6	12	0	11	10	1	0	2	33	1	0	92	1022
8:10 AM	4	13	3	0	0	8	6	0	9	13	0	0	2	29	1	0	88	1043
8:15 AM	2	9	2	0	0	10	10	0	7	13	0	0	0	28	1	0	82	1015
8:20 AM	1	7	2	0	1	9	8	0	4	12	2	0	1	33	0	0	80	1030
8:25 AM	1	12	1	0	2	5	7	0	6	13	1	0	0	33	1	0	82	1027
8:30 AM	4	4	1	0	0	6	11	0	9	7	0	0	1	23	0	0	66	1012
8:35 AM	3	8	3	0	3	11	12	0	9	12	1	0	0	23	0	0	85	1002
8:40 AM	1	6	1	0	3	9	6	0	9	9	0	0	2	16	0	0	62	986
8:45 AM	7	6	0	0	3	6	11	0	16	9	1	0	1	23	0	0	83	973
8:50 AM	5	8	0	0	0	4	12	0	22	15	0	0	1	24	2	0	93	974
8:55 AM	1	11	0	0	1	9	11	0	9	13	0	0	0	19	3	0	77	960
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	36	132	12	0	16	132	140	0	120	100	0	0	24	384	20	0	1116	
Heavy Trucks	0	12	0	0	4	8	8	0	4	12	0	0	0	12	0	0	60	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	
Bicycles	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** SE 32nd Ave -- SE Harrison St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894504  
**DATE:** Thu, Feb 7 2019

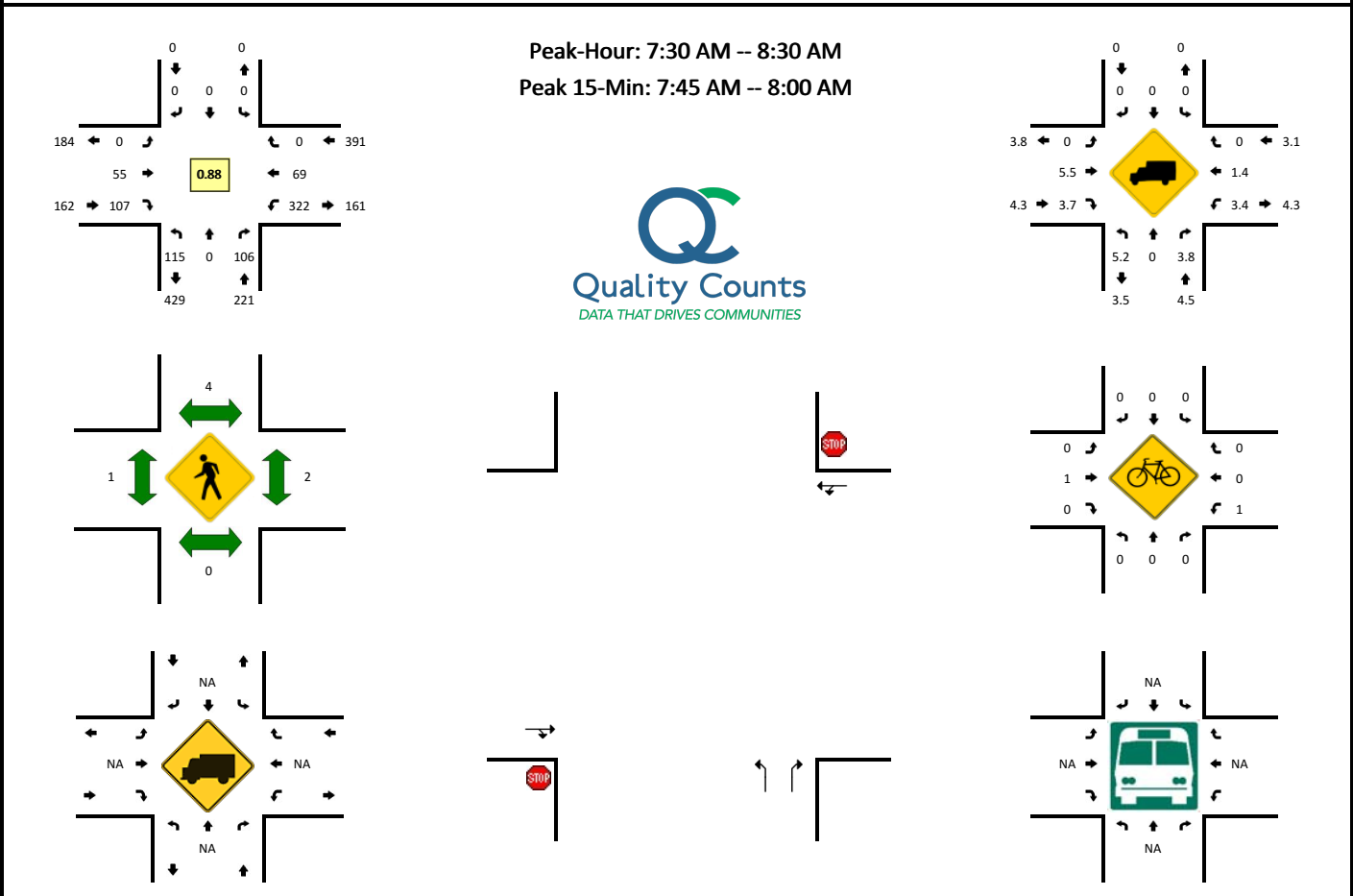


5-Min Count Period Beginning At	SE 32nd Ave (Northbound)				SE 32nd Ave (Southbound)				SE Harrison St (Eastbound)				SE Harrison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	5	2	0	3	12	11	0	11	25	0	0	0	10	2	0	82	
4:05 PM	3	4	1	0	6	5	8	0	3	38	1	0	1	9	1	0	80	
4:10 PM	3	22	1	0	3	17	7	0	8	35	1	0	0	23	0	0	120	
4:15 PM	0	15	3	0	3	9	10	0	10	27	1	0	2	13	1	0	94	
4:20 PM	1	9	2	0	2	19	9	0	9	12	0	0	1	9	0	0	73	
4:25 PM	4	16	3	0	4	6	15	0	16	34	2	0	2	25	1	0	128	
4:30 PM	2	11	3	0	3	8	14	0	9	47	0	0	3	22	0	0	122	
4:35 PM	2	12	1	0	4	19	16	0	4	26	0	0	2	19	3	0	108	
4:40 PM	1	9	1	0	5	9	4	0	3	7	0	0	1	13	5	0	58	
4:45 PM	1	9	0	0	5	7	15	0	11	31	0	0	2	16	0	0	97	
4:50 PM	4	7	6	0	3	17	7	0	13	35	0	0	8	16	2	0	118	
4:55 PM	0	8	2	0	6	11	17	0	4	32	1	0	3	31	1	0	116	1196
5:00 PM	4	7	0	0	3	19	7	0	8	27	0	0	2	16	2	0	95	1209
5:05 PM	2	15	2	0	6	16	12	0	15	40	0	0	3	17	0	0	128	1257
5:10 PM	2	14	3	0	4	9	15	0	15	45	0	0	1	21	1	0	130	1267
5:15 PM	5	13	4	0	6	12	10	0	12	26	0	0	5	16	1	0	110	1283
5:20 PM	1	13	3	0	1	9	9	0	9	43	1	0	2	21	0	0	112	1322
5:25 PM	3	9	4	0	2	6	8	0	4	40	0	0	1	34	3	0	114	1308
5:30 PM	2	14	1	0	6	11	10	0	14	32	1	0	2	17	1	0	111	1297
5:35 PM	4	8	2	0	6	14	5	0	8	42	0	0	0	16	1	0	106	1295
5:40 PM	2	3	0	0	2	8	12	0	13	31	0	0	0	16	3	0	90	1327
5:45 PM	2	15	3	0	4	12	9	0	9	24	0	0	2	19	2	0	101	1331
5:50 PM	1	7	3	0	0	7	4	0	11	35	0	0	3	23	1	0	95	1308
5:55 PM	3	8	0	0	2	5	12	0	9	29	1	0	1	22	1	0	93	1285
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	36	168	36	0	64	148	148	0	168	444	0	0	36	216	8	0	1472	
Heavy Trucks	0	4	0		4	0	0		8	12	0		0	4	0		32	
Pedestrians		0				12				0				28			40	
Bicycles	0	1	0		0	0	0		0	1	1		0	0	0		3	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** SE Oak St -- SE Railroad Ave  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894505  
**DATE:** Thu, Feb 7 2019

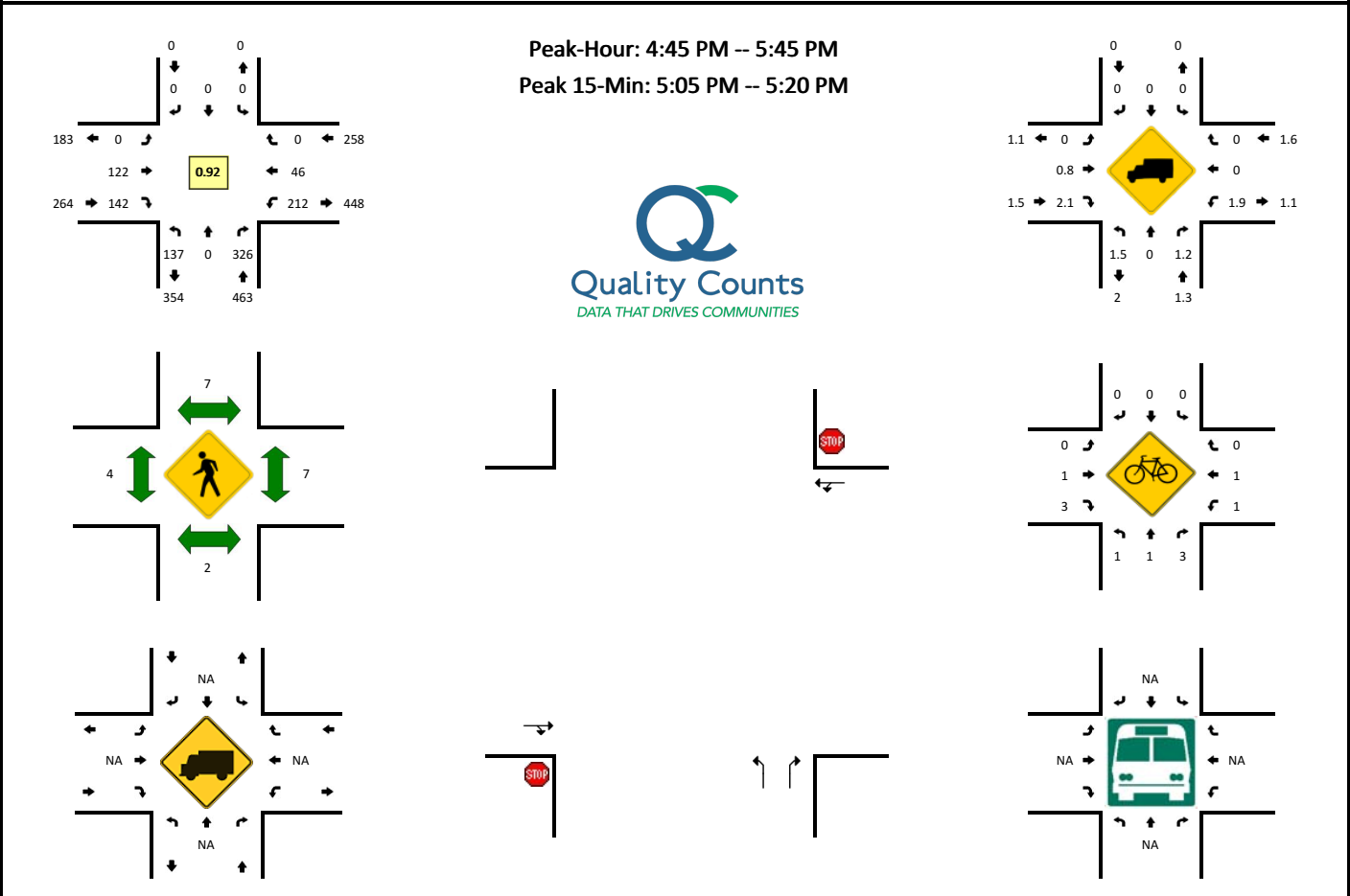


5-Min Count Period Beginning At	SE Oak St (Northbound)				SE Oak St (Southbound)				SE Railroad Ave (Eastbound)				SE Railroad Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	7	0	5	0	0	0	0	0	0	0	6	0	11	6	0	0	35	
7:05 AM	8	0	3	0	0	0	0	0	0	0	2	0	20	5	0	0	39	
7:10 AM	7	0	5	0	0	0	0	0	0	0	3	0	8	8	0	0	35	
7:15 AM	7	0	2	0	0	0	0	0	0	0	11	0	22	9	0	0	56	
7:20 AM	3	0	2	0	0	0	0	0	0	0	11	0	23	7	0	0	52	
7:25 AM	4	0	6	0	0	0	0	0	0	0	13	0	16	3	0	0	46	
7:30 AM	12	0	9	0	0	0	0	0	0	0	10	0	21	7	0	0	64	
7:35 AM	10	0	7	0	0	0	0	0	0	0	1	0	27	7	0	0	59	
7:40 AM	9	0	6	0	0	0	0	0	0	0	9	0	16	7	0	0	55	
7:45 AM	12	0	7	0	0	0	0	0	0	0	9	0	22	2	0	0	57	
7:50 AM	11	0	13	0	0	0	0	0	0	0	7	0	32	3	0	0	70	
7:55 AM	11	0	13	0	0	0	0	0	0	0	16	0	40	5	0	0	92	660
8:00 AM	10	0	12	0	0	0	0	0	0	0	6	0	21	6	0	0	57	682
8:05 AM	6	0	9	0	0	0	0	0	0	0	11	0	20	7	0	0	53	696
8:10 AM	14	0	8	0	0	0	0	0	0	0	10	0	21	7	0	0	65	726
8:15 AM	8	0	5	0	0	0	0	0	0	0	9	0	32	6	0	0	63	733
8:20 AM	4	0	8	0	0	0	0	0	0	0	7	0	29	6	0	0	59	740
8:25 AM	8	0	9	0	0	0	0	0	0	0	12	0	41	6	0	0	80	774
8:30 AM	5	0	15	0	0	0	0	0	0	0	6	0	20	5	0	0	56	766
8:35 AM	9	0	14	0	0	0	0	0	0	0	10	0	11	5	0	0	51	758
8:40 AM	5	0	20	0	0	0	0	0	0	0	9	0	10	6	0	0	54	757
8:45 AM	3	0	10	0	0	0	0	0	0	0	7	0	16	8	0	0	49	749
8:50 AM	6	0	15	0	0	0	0	0	0	0	5	0	9	9	0	0	46	725
8:55 AM	6	0	8	0	0	0	0	0	0	0	5	0	11	3	0	0	37	670
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	136	0	132	0	0	0	0	0	0	64	128	0	376	40	0	0	876	
Heavy Trucks	8	0	4	0	0	0	0	0	0	4	4	0	8	0	0	0	28	
Pedestrians						4				0				0			4	
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** SE Oak St -- SE Railroad Ave  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894506  
**DATE:** Thu, Feb 7 2019

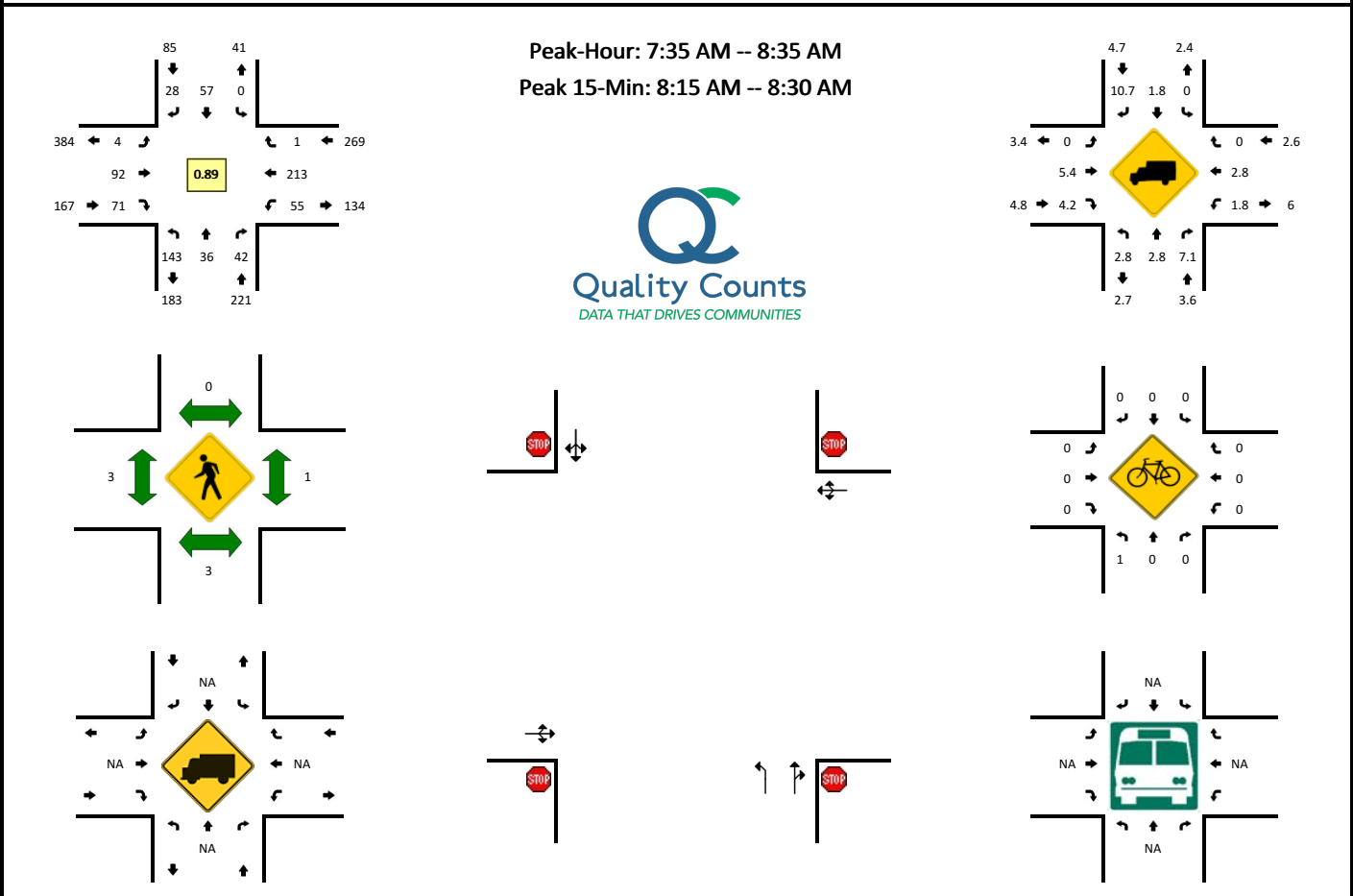


5-Min Count Period Beginning At	SE Oak St (Northbound)				SE Oak St (Southbound)				SE Railroad Ave (Eastbound)				SE Railroad Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	0	17	0	0	0	0	0	0	9	8	0	9	2	0	0	52	
4:05 PM	12	0	20	0	0	0	0	0	0	8	5	0	12	1	0	0	58	
4:10 PM	15	0	32	0	0	0	0	0	0	10	15	0	17	7	0	0	96	
4:15 PM	17	0	31	0	0	0	0	0	0	6	10	0	18	2	0	0	84	
4:20 PM	7	0	11	0	0	0	0	0	0	5	9	0	9	7	0	0	48	
4:25 PM	11	0	42	0	0	0	0	0	0	8	9	0	15	7	0	0	92	
4:30 PM	12	0	21	0	0	0	0	0	0	10	9	0	8	6	0	0	66	
4:35 PM	11	0	28	0	0	0	0	0	0	12	16	0	14	4	0	0	85	
4:40 PM	6	0	8	0	0	0	0	0	0	6	5	0	14	1	0	0	40	
4:45 PM	10	0	32	0	0	0	0	0	0	4	10	0	14	7	0	0	77	
4:50 PM	13	0	31	0	0	0	0	0	0	22	16	0	15	3	0	0	100	
4:55 PM	6	0	24	0	0	0	0	0	0	8	12	0	15	0	0	0	65	863
5:00 PM	11	0	18	0	0	0	0	0	0	9	12	0	16	6	0	0	72	883
5:05 PM	10	0	30	0	0	0	0	0	0	12	21	0	24	4	0	0	101	926
5:10 PM	15	0	29	0	0	0	0	0	0	13	9	0	20	7	0	0	93	923
5:15 PM	12	0	24	0	0	0	0	0	0	5	13	0	15	5	0	0	74	913
5:20 PM	17	0	38	0	0	0	0	0	0	14	11	0	17	4	0	0	101	966
5:25 PM	11	0	35	0	0	0	0	0	0	8	10	0	20	2	0	0	86	960
5:30 PM	13	0	23	0	0	0	0	0	0	11	10	0	12	4	0	0	73	967
5:35 PM	10	0	23	0	0	0	0	0	0	11	10	0	19	3	0	0	76	958
5:40 PM	9	0	19	0	0	0	0	0	0	5	8	0	25	1	0	0	67	985
5:45 PM	10	0	18	0	0	0	0	0	0	8	8	0	18	6	0	0	68	976
5:50 PM	7	0	19	0	0	0	0	0	0	7	8	0	12	3	0	0	56	932
5:55 PM	10	0	17	0	0	0	0	0	0	9	7	0	14	2	0	0	59	926
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	148	0	332	0	0	0	0	0	0	120	172	0	236	64	0	0	1072	
Heavy Trucks	4	0	4	0	0	0	0	0	0	0	0	0	4	0	0	0	12	
Pedestrians		0		0		0		0		0		0		12			12	
Bicycles	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	3	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** SE 37th Ave -- SE Monroe St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894513  
**DATE:** Thu, Feb 7 2019



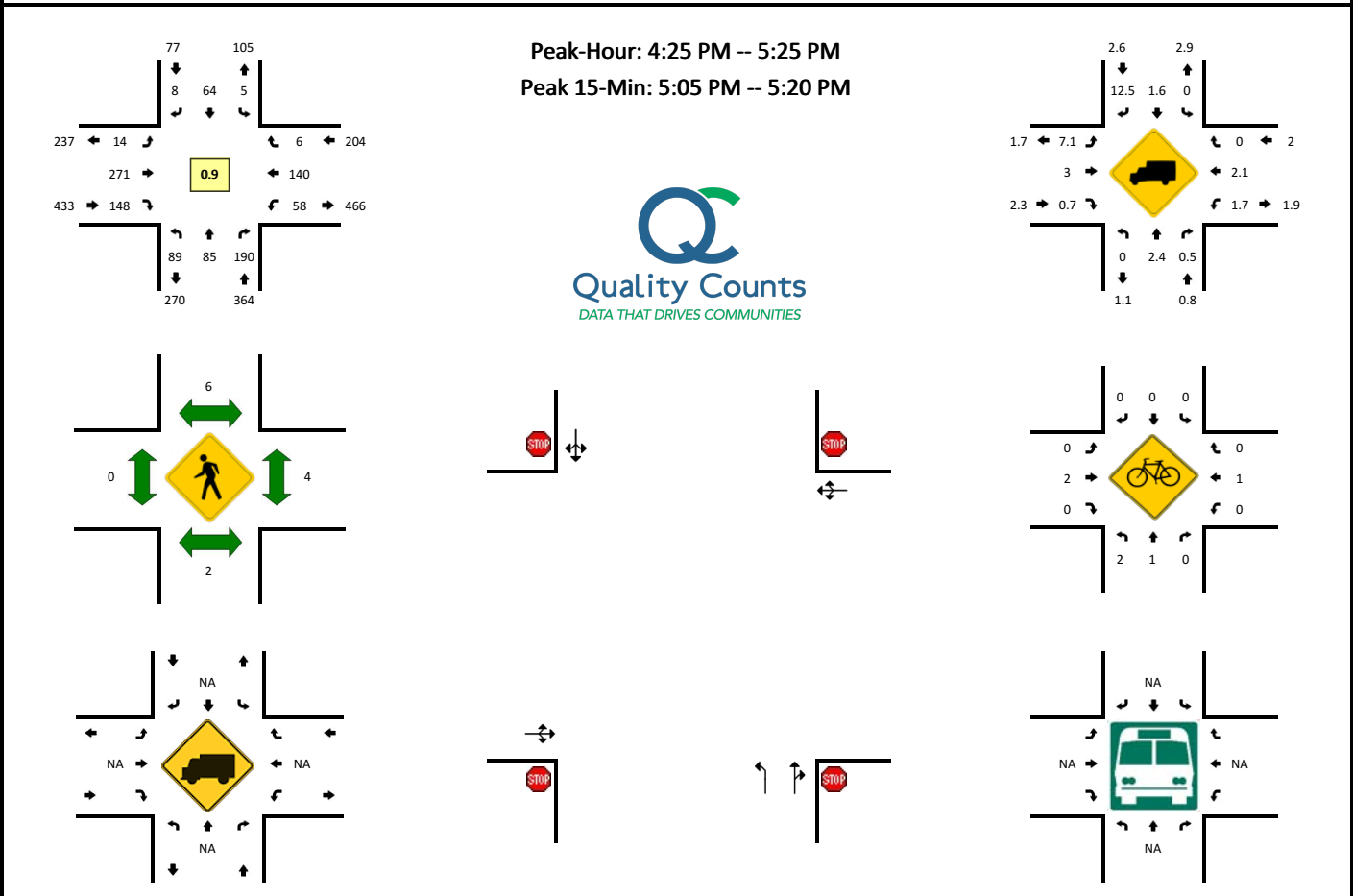
5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE Monroe St (Eastbound)				SE Monroe St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	1	1	0	0	6	1	0	1	1	1	0	5	9	0	0	31	
7:05 AM	13	1	3	0	0	1	2	0	0	7	1	0	4	9	0	0	41	
7:10 AM	11	2	3	0	0	3	0	0	0	3	6	0	4	8	0	0	40	
7:15 AM	16	3	2	0	0	4	2	0	0	4	2	0	7	13	1	0	54	
7:20 AM	11	4	1	0	0	3	3	0	1	2	6	0	2	15	0	0	48	
7:25 AM	10	2	1	0	0	3	1	0	0	6	3	0	4	7	0	0	37	
7:30 AM	9	3	2	0	0	4	1	0	1	6	5	0	2	16	0	0	49	
7:35 AM	12	5	1	0	0	3	1	0	0	6	8	0	1	22	0	0	59	
7:40 AM	10	4	3	0	0	9	3	0	0	6	10	0	1	9	0	0	55	
7:45 AM	9	5	3	0	0	5	3	0	1	3	8	0	3	11	0	0	51	
7:50 AM	15	2	2	0	0	2	2	0	0	9	6	0	4	27	0	0	69	
7:55 AM	12	3	4	0	0	6	3	0	1	12	9	0	10	19	0	0	79	613
8:00 AM	13	1	4	0	0	4	1	0	0	7	3	0	9	14	0	0	56	638
8:05 AM	12	3	4	0	0	5	3	0	0	13	1	0	8	13	0	0	62	659
8:10 AM	12	2	3	0	0	4	1	0	0	8	5	0	5	13	0	0	53	672
8:15 AM	19	3	3	0	0	3	5	0	0	5	3	0	5	18	0	0	64	682
8:20 AM	9	4	8	0	0	6	3	0	1	5	4	0	5	21	0	0	66	700
8:25 AM	13	3	5	0	0	9	1	0	1	9	5	0	2	30	0	0	78	741
8:30 AM	7	1	2	0	0	1	2	0	0	9	9	0	2	16	1	0	50	742
8:35 AM	5	1	2	0	0	2	0	0	1	15	3	0	1	9	1	0	40	723
8:40 AM	9	1	4	0	0	3	0	0	0	15	8	0	3	10	0	0	53	721
8:45 AM	11	1	2	0	0	4	2	0	2	9	6	0	3	9	0	0	49	719
8:50 AM	8	2	4	0	0	4	1	0	0	6	6	0	4	8	1	0	44	694
8:55 AM	4	3	6	0	0	7	1	0	0	8	8	0	2	9	0	0	48	663
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	164	40	64	0	0	72	36	0	8	76	48	0	48	276	0	0	832	
Heavy Trucks	8	0	8	0	0	0	8	0	0	4	0	0	0	8	0	0	36	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:



**LOCATION:** SE 37th Ave -- SE Monroe St  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894514  
**DATE:** Thu, Feb 7 2019



**Peak-Hour:** 4:25 PM -- 5:25 PM  
**Peak 15-Min:** 5:05 PM -- 5:20 PM



5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE Monroe St (Eastbound)				SE Monroe St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	2	16	0	0	1	1	0	0	11	15	0	1	6	0	0	57	
4:05 PM	3	7	16	0	0	6	2	0	1	18	8	0	1	10	1	0	73	
4:10 PM	11	6	17	0	1	4	3	0	7	18	14	0	2	9	1	0	93	
4:15 PM	4	7	19	0	0	6	4	0	1	27	11	0	4	10	0	0	93	
4:20 PM	9	3	7	0	0	4	3	0	1	8	6	0	2	3	0	0	46	
4:25 PM	10	9	24	0	1	3	1	0	2	32	11	0	6	9	1	0	109	
4:30 PM	10	8	13	0	0	4	1	0	5	12	14	0	3	2	1	0	73	
4:35 PM	10	4	18	0	0	3	0	0	2	23	12	0	4	9	0	0	85	
4:40 PM	4	6	13	0	0	8	2	0	0	14	5	0	6	13	2	0	73	
4:45 PM	5	6	13	0	2	5	1	0	0	20	8	0	3	10	0	0	73	
4:50 PM	3	4	18	0	0	4	1	0	0	31	18	0	5	11	0	0	95	
4:55 PM	6	7	13	0	0	8	0	0	2	26	15	0	8	15	0	0	100	970
5:00 PM	10	9	16	0	0	5	0	0	0	13	9	0	5	13	0	0	80	993
5:05 PM	9	10	18	0	1	6	1	0	2	21	18	0	5	17	0	0	108	1028
5:10 PM	11	8	18	0	0	6	0	0	0	27	13	0	2	13	1	0	99	1034
5:15 PM	5	9	19	0	1	6	0	0	0	22	10	0	5	16	0	0	93	1034
5:20 PM	6	5	7	0	0	6	1	0	1	30	15	0	6	12	1	0	90	1078
5:25 PM	6	6	9	0	0	4	3	0	1	31	14	0	6	17	0	0	97	1066
5:30 PM	3	2	9	0	0	4	2	0	2	26	11	0	3	13	0	0	75	1068
5:35 PM	4	4	12	0	0	2	2	0	0	21	13	0	3	14	0	0	75	1058
5:40 PM	13	6	12	0	0	8	1	0	1	12	10	0	2	14	0	0	79	1064
5:45 PM	10	3	11	0	1	5	2	0	0	17	8	0	6	13	0	0	76	1067
5:50 PM	6	2	5	0	1	3	0	0	0	14	13	0	5	8	0	0	57	1029
5:55 PM	4	3	5	0	0	5	1	0	0	14	9	0	4	14	0	0	59	988
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	100	108	220	0	8	72	4	0	8	280	164	0	48	184	4	0	1200	
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	4	0		8	
Pedestrians		4				0				0				0			4	
Bicycles	1	0	0		0	0	0		0	1	0		0	0	0		2	
Railroad																		
Stopped Buses																		

Comments:

# Total Vehicle Summary

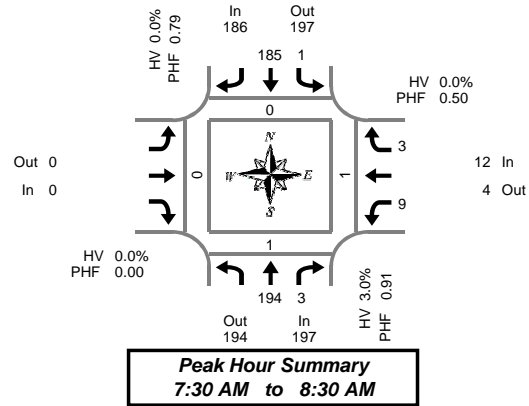


Clay Carney  
(503) 833-2740

## SE 37th Ave & SE Washington St

Wednesday, April 10, 2019

7:00 AM to 9:00 AM



### 5-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	Pedestrians Crosswalk			
	T	R	Bikes	L	T	Bikes		Bikes	L	R	Bikes	North		South	East	West	
7:00 AM	14	0	0	0	13	0		0	0	1	0	0	0	0	0	0	
7:05 AM	8	0	1	0	9	0		0	0	0	0	0	0	0	0	0	
7:10 AM	15	0	0	1	14	0		0	0	0	0	0	0	0	0	0	
7:15 AM	15	0	0	0	13	0		0	1	0	0	0	0	0	0	0	
7:20 AM	15	0	0	0	16	0		0	0	3	0	0	0	0	0	0	
7:25 AM	14	0	0	0	10	0		0	1	0	0	0	0	1	0	0	
7:30 AM	15	0	0	0	17	1		0	3	2	0	0	0	1	0	0	
7:35 AM	16	0	0	0	15	0		0	0	0	0	0	0	0	0	0	
7:40 AM	21	0	0	0	19	0		0	1	0	0	0	0	0	0	0	
7:45 AM	17	0	0	0	18	0		0	1	1	0	0	0	0	0	0	
7:50 AM	12	1	0	0	21	0		0	0	0	0	0	0	0	0	0	
7:55 AM	12	1	0	0	20	0		0	2	0	0	0	0	0	0	0	
8:00 AM	24	0	0	0	14	0		0	0	0	0	0	0	1	0	0	
8:05 AM	11	0	0	0	12	0		0	0	0	0	0	0	0	0	0	
8:10 AM	18	0	0	0	7	0		0	2	0	0	0	0	0	0	0	
8:15 AM	13	0	0	0	15	0		0	0	0	0	0	0	0	0	0	
8:20 AM	21	0	0	1	13	0		0	0	0	0	0	0	0	0	0	
8:25 AM	14	1	0	0	14	1		0	0	0	0	0	0	0	0	0	
8:30 AM	11	1	0	0	13	0		0	0	0	0	0	0	0	0	0	
8:35 AM	12	0	0	0	14	1		0	2	0	0	0	0	0	0	0	
8:40 AM	12	0	0	1	13	0		0	0	0	0	0	1	1	0	0	
8:45 AM	11	0	0	0	10	0		0	1	0	0	0	0	0	0	0	
8:50 AM	11	0	0	0	18	0		0	0	0	0	0	0	0	0	0	
8:55 AM	13	0	0	0	15	1		0	0	0	0	0	0	0	0	0	
Total Survey	345	4	1	3	343	4		0	14	7	0	716	0	2	3	0	

### 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	Pedestrians Crosswalk			
	T	R	Bikes	L	T	Bikes		Bikes	L	R	Bikes	North		South	East	West	
7:00 AM	37	0	1	1	36	0		0	0	1	0	75	0	0	0	0	
7:15 AM	44	0	0	0	39	0		0	2	3	0	88	0	0	1	0	
7:30 AM	52	0	0	0	51	1		0	4	2	0	109	0	0	1	0	
7:45 AM	41	2	0	0	59	0		0	3	1	0	106	0	0	0	0	
8:00 AM	53	0	0	0	33	0		0	2	0	0	88	0	1	0	0	
8:15 AM	48	1	0	1	42	1		0	0	0	0	92	0	0	0	0	
8:30 AM	35	1	0	1	40	1		0	2	0	0	79	0	1	1	0	
8:45 AM	35	0	0	0	43	1		0	1	0	0	79	0	0	0	0	
Total Survey	345	4	1	3	343	4		0	14	7	0	716	0	2	3	0	

### Peak Hour Summary 7:30 AM to 8:30 AM

By Approach	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	197	194	391	0	186	197	383	2	0	0	0	0	12	4	16	0	395
%HV	3.0%			0.0%			0.0%			0.0%			1.5%				
PHF	0.91			0.79			0.00			0.50			0.88				

By Movement	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Total
	T	R	Total	L	T	Total		Total	L	R	Total		
Volume	194	3	197	1	185	186		0	9	3	12	395	
%HV	NA	3.1%	0.0%	3.0%	0.0%	0.0%	NA	0.0%	0.0%	NA	0.0%	1.5%	
PHF	0.90	0.38	0.91	0.25	0.78	0.79		0.00	0.56	0.38	0.50	0.88	

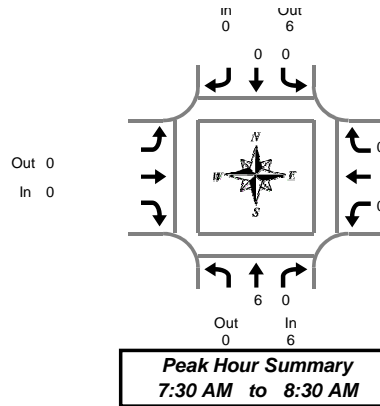
### Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	Pedestrians Crosswalk			
	T	R	Bikes	L	T	Bikes		Bikes	L	R	Bikes	North		South	East	West	
7:00 AM	174	2	1	1	185	1		0	9	7	0	378	0	0	2	0	
7:15 AM	190	2	0	0	182	1		0	11	6	0	391	0	1	2	0	
7:30 AM	194	3	0	1	185	2		0	9	3	0	395	0	1	1	0	
7:45 AM	177	4	0	2	174	2		0	7	1	0	365	0	2	1	0	
8:00 AM	171	2	0	2	158	3		0	5	0	0	338	0	2	1	0	

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## SE 37th Ave & SE Washington St

Wednesday, April 10, 2019

7:00 AM to 9:00 AM

### Heavy Vehicle 5-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	
	T	R	Total	L	T	Total	Total	L	R	Total	L	R		Total
7:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	3	0	3	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:10 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	1	1	1	0	0	0	0	0	0	1
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	1	1	1	0	0	0	0	0	0	1
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	8	0	8	0	2	2	2	0	0	0	0	0	0	10

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	
	T	R	Total	L	T	Total	Total	L	R	Total	L	R		Total
7:00 AM	2	0	2	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	3	0	3	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	1	1	1	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	1	1	1	0	0	0	0	0	0	1
Total Survey	8	0	8	0	2	2	2	0	0	0	0	0	0	10

### Heavy Vehicle Peak Hour Summary 7:30 AM to 8:30 AM

By Approach	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	6	0	6	0	6	6	0	0	0	0	0	0	6
PHF	0.38			0.00			0.00			0.00			0.38

By Movement	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Total	
	T	R	Total	L	T	Total	Total	L	R	Total	L	R		Total
Volume	6	0	6	0	0	0	0	0	0	0	0	0	0	6
PHF	0.38	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	
	T	R	Total	L	T	Total	Total	L	R	Total	L	R		Total
7:00 AM	6	0	6	0	0	0	0	0	0	0	0	0	0	6
7:15 AM	5	0	5	0	0	0	0	0	0	0	0	0	0	5
7:30 AM	6	0	6	0	0	0	0	0	0	0	0	0	0	6
7:45 AM	3	0	3	0	1	1	1	0	0	0	0	0	0	4
8:00 AM	2	0	2	0	2	2	2	0	0	0	0	0	0	4

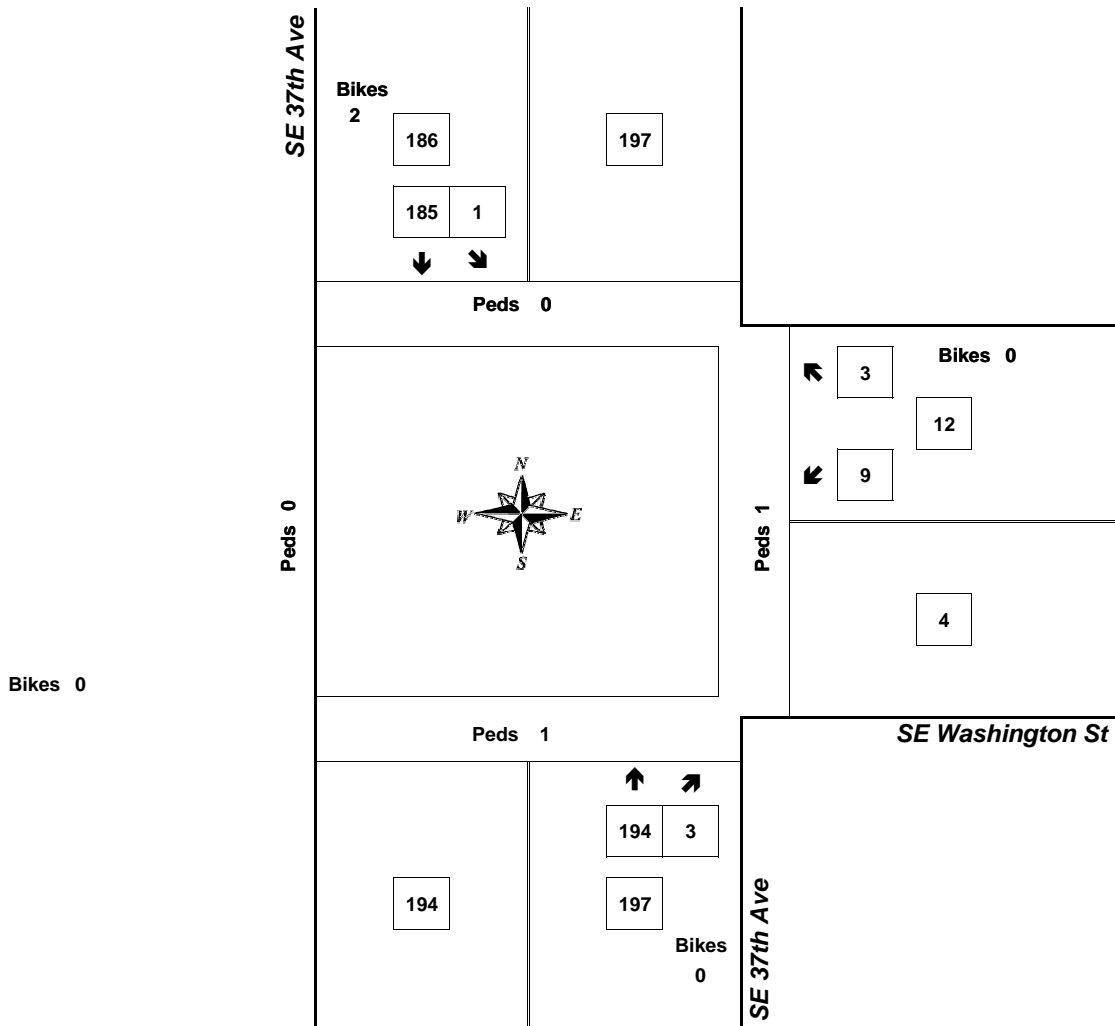
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## SE 37th Ave & SE Washington St

7:30 AM to 8:30 AM  
Wednesday, April 10, 2019



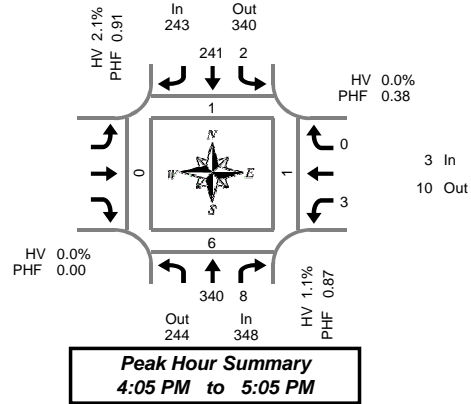
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.50	0.0%	12
NB	0.91	3.0%	197
SB	0.79	0.0%	186
<b>Intersection</b>	<b>0.88</b>	<b>1.5%</b>	<b>395</b>

Count Period: 7:00 AM to 9:00 AM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## SE 37th Ave & SE Washington St

Tuesday, April 09, 2019  
4:00 PM to 6:00 PM

### 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	Pedestrians Crosswalk			
	T	R	Bikes	L	T	Bikes		Bikes	L	R	Bikes	North		South	East	West	
4:00 PM	26	0	0	0	14	0		0	0	0	0	40	0	0	0	0	
4:05 PM	39	1	0	1	21	0		0	0	0	0	62	0	0	0	0	
4:10 PM	39	2	0	0	25	0		0	1	0	0	67	0	0	0	0	
4:15 PM	18	1	0	0	15	0		0	1	0	0	35	0	1	0	0	
4:20 PM	28	0	0	0	17	0		0	0	0	0	45	0	0	0	0	
4:25 PM	27	0	0	0	23	0		0	0	0	0	50	0	2	1	0	
4:30 PM	26	1	0	0	27	0		0	0	0	0	54	1	0	0	0	
4:35 PM	33	0	0	0	11	1		0	0	0	0	44	0	0	0	0	
4:40 PM	18	2	0	0	18	1		0	0	0	0	38	0	0	0	0	
4:45 PM	27	1	0	0	22	0		0	0	0	0	50	0	1	0	0	
4:50 PM	27	0	0	0	18	0		0	0	0	0	45	0	0	0	0	
4:55 PM	28	0	0	1	25	0		0	0	0	0	54	0	0	0	0	
5:00 PM	30	0	0	0	19	0		0	1	0	0	50	0	2	0	0	
5:05 PM	36	0	0	1	15	0		0	0	1	0	53	0	0	0	0	
5:10 PM	24	0	0	0	23	0		0	0	0	0	47	0	0	0	0	
5:15 PM	26	0	0	0	23	0		0	1	0	0	50	0	2	0	0	
5:20 PM	20	0	0	0	13	0		0	1	0	0	34	0	2	2	0	
5:25 PM	24	0	0	1	24	0		0	3	0	0	52	0	0	0	0	
5:30 PM	33	0	2	0	14	0		0	0	0	0	47	0	0	0	0	
5:35 PM	21	0	0	0	21	0		0	1	0	0	43	0	0	0	0	
5:40 PM	19	1	0	0	21	0		0	0	0	0	41	0	0	0	0	
5:45 PM	12	0	0	0	20	0		0	1	0	0	33	0	2	0	0	
5:50 PM	17	0	0	0	18	0		0	0	0	0	35	0	0	0	0	
5:55 PM	18	1	0	1	16	0		0	0	0	0	36	0	1	0	0	
Total Survey	616	10	2	5	463	2		0	10	1	0	1,105	1	13	3	0	

### 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	Pedestrians Crosswalk			
	T	R	Bikes	L	T	Bikes		Bikes	L	R	Bikes	North		South	East	West	
4:00 PM	104	3	0	1	60	0		0	1	0	0	169	0	0	0	0	
4:15 PM	73	1	0	0	55	0		0	1	0	0	130	0	3	1	0	
4:30 PM	77	3	0	0	56	2		0	0	0	0	136	1	0	0	0	
4:45 PM	82	1	0	1	65	0		0	0	0	0	149	0	1	0	0	
5:00 PM	90	0	0	1	57	0		0	1	1	0	150	0	2	0	0	
5:15 PM	70	0	0	1	60	0		0	5	0	0	136	0	4	2	0	
5:30 PM	73	1	2	0	56	0		0	1	0	0	131	0	0	0	0	
5:45 PM	47	1	0	1	54	0		0	1	0	0	104	0	3	0	0	
Total Survey	616	10	2	5	463	2		0	10	1	0	1,105	1	13	3	0	

### Peak Hour Summary 4:05 PM to 5:05 PM

By Approach	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Total	Pedestrians Crosswalk							
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West				
Volume	348	244	592	0	243	340	583	2	0	0	0	0	3	10	13	0	594	1	6	1	0
%HV	1.1%			2.1%			0.0%			0.0%			1.5%								
PHF	0.87			0.91			0.00			0.38			0.91								

By Movement	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Total
	T	R	Total	L	T	Total		Total	L	R	Total		
Volume	340	8	348	2	241	243		0	3	0	3	594	
%HV	NA	1.2%	0.0%	1.1%	0.0%	2.1%	NA	2.1%	NA	NA	NA	1.5%	
PHF	0.89	0.50	0.87	0.50	0.90	0.91		0.00	0.38	0.00	0.38	0.91	

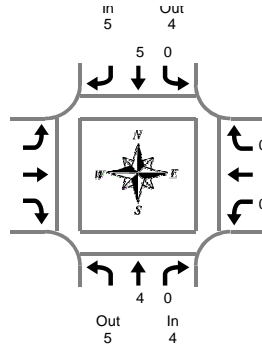
### Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	Pedestrians Crosswalk			
	T	R	Bikes	L	T	Bikes		Bikes	L	R	Bikes	North		South	East	West	
4:00 PM	336	8	0	2	236	2		0	2	0	0	584	1	4	1	0	
4:15 PM	322	5	0	2	233	2		0	2	1	0	565	1	6	1	0	
4:30 PM	319	4	0	3	238	2		0	6	1	0	571	1	7	2	0	
4:45 PM	315	2	2	3	238	0		0	7	1	0	566	0	7	2	0	
5:00 PM	280	2	2	3	227	0		0	8	1	0	521	0	9	2	0	

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## SE 37th Ave & SE Washington St

Tuesday, April 09, 2019

4:00 PM to 6:00 PM

**Peak Hour Summary**  
4:05 PM to 5:05 PM

### Heavy Vehicle 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	
	T	R	Total	L	T	Total	Total	L	R	Total	L	R		Total
4:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	1
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	1	0	1	0	2	2	0	0	0	0	0	0	0	3
4:25 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	1	0	1	0	1	1	0	0	0	0	0	0	0	2
4:35 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	1
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	0	1	0	1	1	0	0	0	0	0	0	0	2
5:05 PM	1	0	1	0	0	0	0	0	0	1	1	1	2	2
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	2	0	2	0	0	0	0	0	0	0	0	0	0	2
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
5:50 PM	1	0	1	0	1	1	0	0	0	0	0	0	0	2
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	10	0	10	0	7	7	0	0	0	1	1	1	18	18

### Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	
	T	R	Total	L	T	Total	Total	L	R	Total	L	R		Total
4:00 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	1
4:15 PM	2	0	2	0	2	2	0	0	0	0	0	0	0	4
4:30 PM	1	0	1	0	2	2	0	0	0	0	0	0	0	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	2	0	2	0	1	1	0	0	0	1	1	1	4	4
5:15 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	2	0	2	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	2	0	2	0	1	1	0	0	0	0	0	0	0	3
Total Survey	10	0	10	0	7	7	0	0	0	1	1	1	18	18

### Heavy Vehicle Peak Hour Summary 4:05 PM to 5:05 PM

By Approach	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	4	5	9	5	4	9	0	0	0	0	0	0	9
PHF	0.33			0.42			0.00			0.00			0.38

By Movement	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Total	
	T	R	Total	L	T	Total	Total	L	R	Total	L	R		Total
Volume	4	0	4	0	5	5	0	0	0	0	0	0	0	9
PHF	0.33	0.00	0.33	0.00	0.42	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38

### Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 37th Ave			Southbound SE 37th Ave			Eastbound SE Washington St			Westbound SE Washington St			Interval Total	
	T	R	Total	L	T	Total	Total	L	R	Total	L	R		Total
4:00 PM	3	0	3	0	5	5	0	0	0	0	0	0	0	8
4:15 PM	5	0	5	0	5	5	0	0	0	1	1	1	1	11
4:30 PM	4	0	4	0	3	3	0	0	0	1	1	1	1	8
4:45 PM	5	0	5	0	1	1	0	0	0	1	1	1	1	7
5:00 PM	7	0	7	0	2	2	0	0	0	1	1	1	1	10

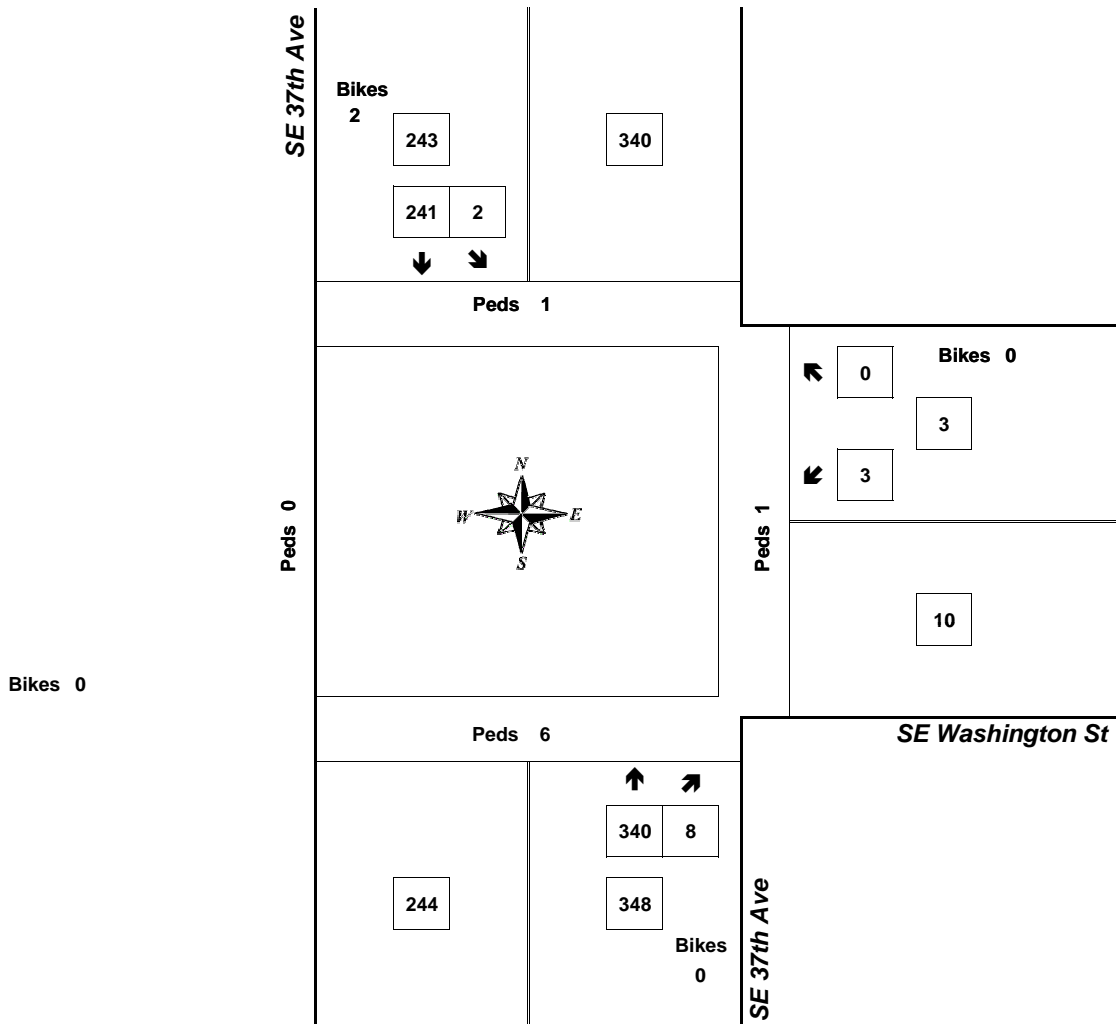
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## SE 37th Ave & SE Washington St

4:05 PM to 5:05 PM  
Tuesday, April 09, 2019



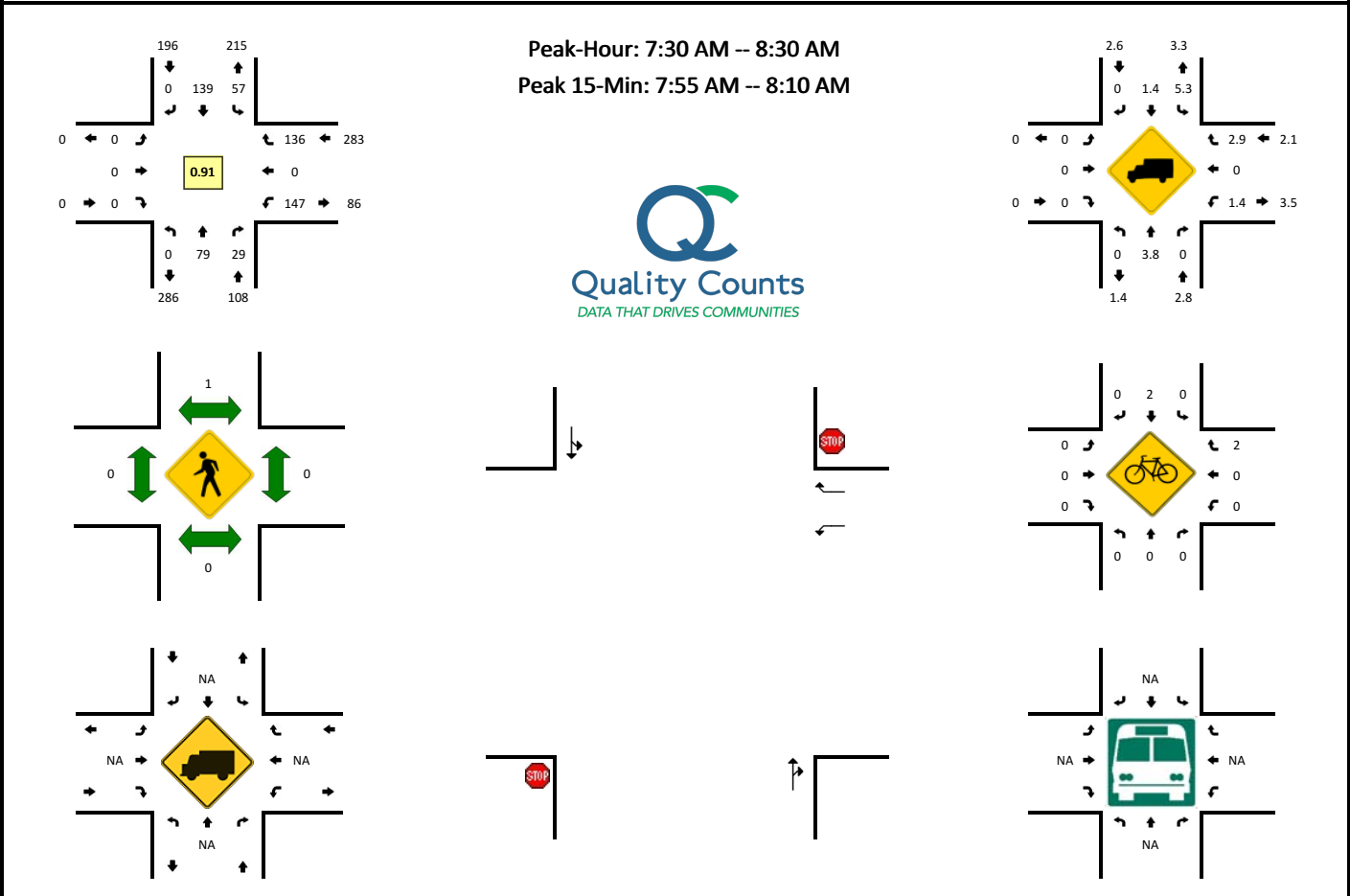
Bikes 0

Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.38	0.0%	3
NB	0.87	1.1%	348
SB	0.91	2.1%	243
<b>Intersection</b>	<b>0.91</b>	<b>1.5%</b>	<b>594</b>

Count Period: 4:00 PM to 6:00 PM

**LOCATION:** SE 37th Ave -- SE Railroad Ave  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894515  
**DATE:** Thu, Feb 7 2019



5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE Railroad Ave (Eastbound)				SE Railroad Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	2	0	0	1	10	0	0	0	0	0	0	8	0	8	0	29	
7:05 AM	0	4	2	0	1	6	0	0	0	0	0	0	4	0	13	0	30	
7:10 AM	0	3	0	0	5	5	0	0	0	0	0	0	7	0	10	0	30	
7:15 AM	0	6	0	0	1	14	0	0	0	0	0	0	7	0	14	0	42	
7:20 AM	0	4	3	0	5	5	0	0	0	0	0	0	16	0	9	0	42	
7:25 AM	0	4	1	0	3	9	0	0	0	0	0	0	7	0	12	0	36	
7:30 AM	0	6	1	0	5	8	0	0	0	0	0	0	11	0	6	0	37	
7:35 AM	0	5	3	0	6	8	0	0	0	0	0	0	18	0	9	0	49	
7:40 AM	0	7	3	0	5	13	0	0	0	0	0	0	12	0	11	0	51	
7:45 AM	0	6	3	0	10	12	0	0	0	0	0	0	14	0	7	0	52	
7:50 AM	0	3	2	0	5	8	0	0	0	0	0	0	10	0	16	0	44	
7:55 AM	0	12	3	0	6	17	0	0	0	0	0	0	10	0	9	0	57	499
8:00 AM	0	5	4	0	4	13	0	0	0	0	0	0	17	0	12	0	55	525
8:05 AM	0	8	1	0	1	16	0	0	0	0	0	0	12	0	12	0	50	545
8:10 AM	0	2	2	0	6	8	0	0	0	0	0	0	15	0	13	0	46	561
8:15 AM	0	7	1	0	4	8	0	0	0	0	0	0	9	0	19	0	48	567
8:20 AM	0	10	4	0	1	15	0	0	0	0	0	0	15	0	11	0	56	581
8:25 AM	0	8	2	0	4	13	0	0	0	0	0	0	4	0	11	0	42	587
8:30 AM	0	6	3	0	7	6	0	0	0	0	0	0	6	0	5	0	33	583
8:35 AM	0	5	5	0	2	4	0	0	0	0	0	0	8	0	5	0	29	563
8:40 AM	0	5	1	0	7	7	0	0	0	0	0	0	8	0	8	0	36	548
8:45 AM	0	4	4	0	4	8	0	0	0	0	0	0	5	0	11	0	36	532
8:50 AM	0	7	4	0	6	12	0	0	0	0	0	0	9	0	5	0	43	531
8:55 AM	0	10	0	0	4	11	0	0	0	0	0	0	8	0	5	0	38	512
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	100	32	0	44	184	0	0	0	0	0	0	156	0	132	0	648	
Heavy Trucks	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	8	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Railroad																		
Stopped Buses																		

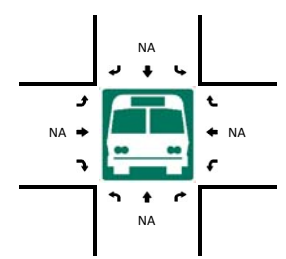
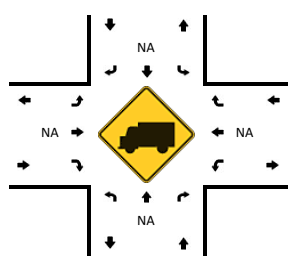
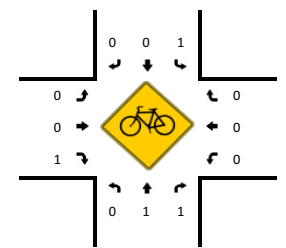
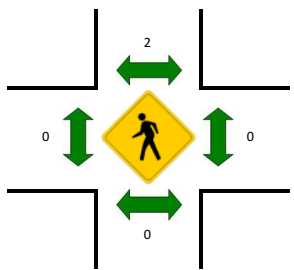
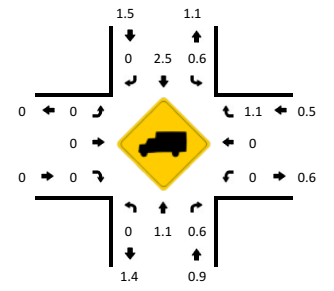
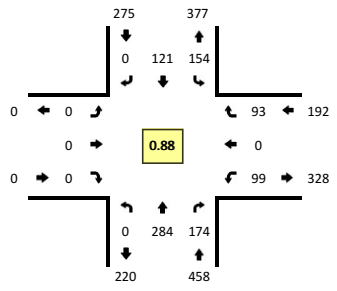
Comments:



**LOCATION:** SE 37th Ave -- SE Railroad Ave  
**CITY/STATE:** Clackamas, OR

**QC JOB #:** 14894516  
**DATE:** Thu, Feb 7 2019

**Peak-Hour: 4:25 PM -- 5:25 PM**  
**Peak 15-Min: 5:00 PM -- 5:15 PM**



5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE Railroad Ave (Eastbound)				SE Railroad Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	20	11	0	13	1	0	0	0	0	0	0	12	0	4	0	61	
4:05 PM	0	22	8	0	11	6	0	0	0	0	0	0	16	0	4	0	67	
4:10 PM	0	30	12	0	12	5	0	0	0	0	0	0	8	0	9	0	76	
4:15 PM	0	29	16	0	15	9	0	0	0	0	0	0	11	0	4	0	84	
4:20 PM	0	10	3	0	7	4	0	0	0	0	0	0	2	0	9	0	35	
4:25 PM	0	37	23	0	12	8	0	0	0	0	0	0	6	0	8	0	94	
4:30 PM	0	20	16	0	13	8	0	0	0	0	0	0	8	0	10	0	75	
4:35 PM	0	24	19	0	13	4	0	0	0	0	0	0	4	0	7	0	71	
4:40 PM	0	17	10	0	11	8	0	0	0	0	0	0	3	0	8	0	57	
4:45 PM	0	21	10	0	6	15	0	0	0	0	0	0	10	0	8	0	70	
4:50 PM	0	21	17	0	17	12	0	0	0	0	0	0	7	0	4	0	78	
4:55 PM	0	21	10	0	16	17	0	0	0	0	0	0	9	0	4	0	77	845
5:00 PM	0	28	15	0	12	6	0	0	0	0	0	0	10	0	11	0	82	866
5:05 PM	0	28	22	0	16	12	0	0	0	0	0	0	9	0	9	0	96	895
5:10 PM	0	33	10	0	14	8	0	0	0	0	0	0	10	0	10	0	85	904
5:15 PM	0	23	13	0	9	11	0	0	0	0	0	0	14	0	5	0	75	895
5:20 PM	0	11	9	0	15	12	0	0	0	0	0	0	9	0	9	0	65	925
5:25 PM	0	13	17	0	14	10	0	0	0	0	0	0	6	0	7	0	67	898
5:30 PM	0	10	9	0	11	9	0	0	0	0	0	0	9	0	4	0	52	875
5:35 PM	0	20	11	0	12	7	0	0	0	0	0	0	11	0	4	0	65	869
5:40 PM	0	16	4	0	11	8	0	0	0	0	0	0	7	0	11	0	57	869
5:45 PM	0	14	9	0	8	11	0	0	0	0	0	0	5	0	9	0	56	855
5:50 PM	0	9	5	0	11	9	0	0	0	0	0	0	5	0	8	0	47	824
5:55 PM	0	10	8	0	8	9	0	0	0	0	0	0	2	0	3	0	40	787

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	356	188	0	168	104	0	0	0	0	0	0	116	0	120	0	1052	
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	4		8	
Pedestrians		0				0				0				0				0
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1	
Railroad																		
Stopped Buses																		

Comments:

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

HARRISON ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2016</b>														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	1	1	2	0	1	1	0	1	0	2	2	0	0
TURNING MOVEMENTS	0	3	2	5	0	5	0	3	2	2	3	5	0	0
<b>YEAR 2016 TOTAL</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>8</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>8</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2015</b>														
ANGLE	1	0	0	1	1	0	0	1	0	1	0	1	0	0
REAR-END	0	3	0	3	0	4	0	3	0	3	0	3	0	0
TURNING MOVEMENTS	0	1	1	2	0	3	0	1	1	2	0	2	0	0
<b>YEAR 2015 TOTAL</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2014</b>														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	1	1	2	0	1	0	2	0	2	0	2	0	0
<b>YEAR 2014 TOTAL</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2013</b>														
ANGLE	0	1	0	1	0	1	0	0	1	1	0	1	0	0
REAR-END	0	1	4	5	0	1	0	3	2	3	2	5	0	0
<b>YEAR 2013 TOTAL</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2012</b>														
ANGLE	0	0	2	2	0	0	1	1	1	1	1	2	0	0
REAR-END	0	3	1	4	0	3	0	4	0	4	0	4	0	0

HARRISON ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
TURNING MOVEMENTS	0	3	0	3	0	5	0	2	1	2	1	3	0	0
YEAR 2012 TOTAL	0	6	3	9	0	8	1	7	2	7	2	9	0	0
FINAL TOTAL	1	17	14	32	1	24	2	22	9	23	9	32	0	0

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















URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

HARRISON ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

28 - 31 of 32 Crash records shown.

SER#	S D		DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE			CRASH	SPCL USE		MOVE	PRTC	INJ	G E LICNS	PED	ERROR	ACT	EVENT	CAUSE	
	P	R S W					(MEDIAN)	INT-REL	OFFRD		WTHR	TRLR QTY										OWNER
INVEST	E A U C O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	PRTC	INJ	G E LICNS	PED	ERROR	ACT	EVENT	CAUSE		
RD DPT	E L G H R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	P#	TYPE	SVRTY	E X RES	LOC	ERROR	ACT	EVENT	CAUSE	
UNLOC?	D C S L K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E X RES	LOC	ERROR	ACT	EVENT	CAUSE
04092	N N N	09/06/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT									02
CITY		TU		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN	PRVTE		N -S								000	00
N		12P			01	0		N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	46 M	OR-Y		000		000		00
N		45 26 47.55	-122 37 56.24	017100100S00												OR<25						
											01 NONE	0	STRGHT									
											PRVTE		N -S								000	00
											PSNGR CAR		02 PSNG	INJC	21 F			000		000		00
											02 NONE	0	TURN-L									
											PRVTE		S -W								000	00
											PSNGR CAR		01 DRVR	NONE	29 F	OR-Y		028,004		000		02
																OR<25						
05942	N N N	12/18/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT									02
NONE		SU		HARRISON ST	CN		TRF SIGNAL	N	ICE	TURN	PRVTE		W -E								000	00
N		6P			03	0		N	DLIT	INJ	PSNGR CAR		01 DRVR	NONE	24 M	OR-Y		000		000		00
N		45 26 47.55	-122 37 56.24	017100100S00												OR<25						
											01 NONE	0	STRGHT									
											PRVTE		W -E								000	00
											PSNGR CAR		02 PSNG	INJC	45 F			000		000		00
											02 NONE	0	TURN-L									
											PRVTE		E -S								000	00
											PSNGR CAR		01 DRVR	NONE	19 F	OR-Y		028,004		000		02
																OR<25						
00458	N N N	01/27/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1TURN	01 NONE	9	TURN-R									08
NONE		WE		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN	N/A		W -S								000	00
N		10A			03	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk UNK		000		000		00
N		45 26 47.55	-122 37 56.24	017100100S00												UNK						
											02 NONE	9	STRGHT									
											N/A		W -E								000	00
											PSNGR CAR		01 DRVR	NONE	00	Unk UNK		000		000		00
																UNK						
00923	N N N N N	02/26/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01 NONE	9	TURN-L									02
CITY		FR		HARRISON ST	CN		TRF SIGNAL	N	WET	TURN	N/A		E -S								000	00
N		9P			03	0		N	DLIT	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk UNK		000		000		00
N		45 26 47.55	-122 37 56.24	017100100S00												UNK						
											02 NONE	9	STRGHT									
											N/A		W -E								000	00
											PSNGR CAR		01 DRVR	NONE	00	Unk UNK		000		000		00
																UNK						

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

HARRISON ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

32 - 32 of 32 Crash records shown.

SER#	P	R S W DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	A S														ERROR			ACT	EVENT	CAUSE																	
INVEST	E A U C O DAY	RD DPT	E L G H R TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G E LICNS	PED	UNLOC?	D C S L K LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E X RES	LOC								
05819	N N N	12/14/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE	9	STRGHT																									093	04				
NO RPT		WE		HARRISON ST	CN			TRF SIGNAL	N	DRY	ANGL	N/A	E -W																										000	00			
N		8A			02	0			N	DAY	PDO	PSNGR CAR		01	DRVR	NONE	00	Unk UNK																				000	000		00		
N		45 26 47.55	-122 37 56.24	017100100S00										02	NONE	9	STRGHT																							000	00		
													S -N																										000	000		00	
													PSNGR CAR		01	DRVR	NONE	00	Unk UNK																				000	000		00	

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

MONROE ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2016</b>														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
<b>YEAR 2016 TOTAL</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2015</b>														
REAR-END	0	1	1	2	0	2	0	1	1	1	1	2	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
<b>YEAR 2015 TOTAL</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2014</b>														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	2	0	2	0	2	0	2	0	2	0	2	0	0
<b>YEAR 2014 TOTAL</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2013</b>														
ANGLE	0	1	0	1	0	1	0	0	1	1	0	1	0	0
REAR-END	0	1	0	1	0	3	0	0	1	1	0	1	0	0
<b>YEAR 2013 TOTAL</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2012</b>														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

MONROE ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
PEDESTRIAN	0	1	0	1	0	1	0	0	1	0	1	1	0	0
YEAR 2012 TOTAL	0	2	0	2	0	2	0	1	1	1	1	2	0	0
FINAL TOTAL	0	8	3	11	0	11	0	7	4	9	2	11	0	0

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CITY OF MILWAUKIE, CLACKAMAS COUNTY

MONROE ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

1 - 3 of 11 Crash records shown.

SER#	S P	D R S W DATE	CLASS	CITY STREET	INT-TYPE	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	PRTC	INJ	G E LICNS	PED	ERROR	ACT	EVENT	CAUSE	
INVEST	E A U C O DAY	RD DPT	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM										
UNLOC?	D C S L K LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO		P#	TYPE	SVRTY	E X RES	LOC				
03587	N N N N N	09/24/2013	12	CLACKAMAS HY	INTER	CROSS	N	N	N	RAIN	S-1STOP	01 NONE 0	STRGHT							013	07	
CITY	TU			MONROE ST	N		TRF SIGNAL	N	WET	REAR	PRVTE	N -S								000	00	
N		3P			06	0		N	DAY	INJ	PSNGR CAR			01	DRVR	INJC	59 F	OR-Y		026	000	07
N		45 26	-122 37	017100100S00														OR<25				
		42.6596639	54.105024																			
											02 NONE 0	STOP										
											PRVTE	N -S								011	013	00
											PSNGR CAR			01	DRVR	INJC	33 M	OR-Y		000	000	00
																		OR<25				
											03 NONE 0	STOP								022	000	00
											PRVTE	N -S								000	000	00
											PSNGR CAR			01	DRVR	INJC	61 F	OR-Y		000	000	00
																		OR<25				
											03 NONE 0	STOP								022	000	00
											PRVTE	N -S								000	000	00
											PSNGR CAR			02	PSNG	NO<5	01 M			000	000	00
											03 NONE 0	STOP								022	000	00
											PRVTE	N -S								000	000	00
											PSNGR CAR			03	PSNG	NO<5	04 F			000	000	00
03680	N N N N N	09/19/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	N	CLR	S-1STOP	01 NONE 0	STRGHT								07	
NONE	FR			MONROE ST	N		TRF SIGNAL	N	DRY	REAR	PRVTE	N -S								000	00	
N		5P			06	0		N	DAY	INJ	PSNGR CAR			01	DRVR	NONE	19 F	OR-Y		043,026	000	07
N		45 26	42.66	-122 37	017100100S00													OR<25				
			54.11																			
											02 NONE 0	STOP										
											PRVTE	N -S								011	000	00
											PSNGR CAR			01	DRVR	INJC	27 F	OR-Y		000	000	00
																		OR<25				
00337	N N N N N	01/25/2014	17	CLACKAMAS HY	INTER	CROSS	N	N	N	CLR	S-1STOP	01 NONE 0	STRGHT								07	
CITY	SA			MONROE ST	E		TRF SIGNAL	N	DRY	REAR	PRVTE	E -W								000	00	
N		4P			06	0		N	DAY	INJ	PSNGR CAR			01	DRVR	NONE	30 M	OR-Y		026	000	07
N		45 26	-122 37	0171AC100S00														OR<25				
		42.6596999	54.1050599																			
											02 NONE 0	STOP										
											PRVTE	E -W								011	000	00
											PSNGR CAR			01	DRVR	INJC	33 F	OR-Y		000	000	00
																		OR<25				
00110	N N N N N	01/10/2012	12	CLACKAMAS HY	INTER	CROSS	N	N	N	CLD	PED	01 NONE 0	TURN-R								19,02	
CITY	TU			MONROE ST	S		TRF SIGNAL	N	WET	PED	PRVTE	W -S								000	00	
N		6A			05	0		N	DARK	INJ	PSNGR CAR			01	DRVR	NONE	28 F	OR-Y		029	000	02
N		45 26	-122 37	017100100S00														OR<25				
		42.6407316	54.0991865																			

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OAK ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2016</b>														
ANGLE	0	2	0	2	0	4	0	0	2	1	1	2	0	0
PEDESTRIAN	0	1	0	1	0	1	0	0	1	0	1	1	0	0
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
SIDESWIPE - OVERTAKING	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	2	3	0	1	0	2	1	3	0	3	0	0
<b>YEAR 2016 TOTAL</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>8</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>2</b>	<b>8</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2015</b>														
BACKING	0	1	0	1	0	1	1	0	1	0	1	1	0	0
REAR-END	0	2	1	3	0	2	0	2	0	3	0	3	0	0
<b>YEAR 2015 TOTAL</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2014</b>														
ANGLE	0	3	0	3	0	7	0	1	2	1	2	3	0	0
TURNING MOVEMENTS	0	2	2	4	0	3	0	4	0	3	1	4	0	0
<b>YEAR 2014 TOTAL</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>7</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2013</b>														
ANGLE	0	0	2	2	0	0	0	2	0	1	1	2	0	0
PEDESTRIAN	0	1	0	1	0	1	0	1	0	0	1	1	0	0
REAR-END	0	1	2	3	0	1	1	2	1	2	1	3	0	0
TURNING MOVEMENTS	0	3	2	5	0	3	0	4	1	5	0	5	0	0
<b>YEAR 2013 TOTAL</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>11</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>9</b>	<b>2</b>	<b>8</b>	<b>3</b>	<b>11</b>	<b>0</b>	<b>0</b>

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE  
OAK ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2012</b>														
REAR-END	0	0	2	2	0	0	0	0	2	2	0	2	0	0
TURNING MOVEMENTS	0	0	4	4	0	0	0	4	0	1	3	4	0	0
<b>YEAR 2012 TOTAL</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>0</b>	<b>0</b>
<b>FINAL TOTAL</b>	<b>0</b>	<b>17</b>	<b>19</b>	<b>36</b>	<b>0</b>	<b>24</b>	<b>2</b>	<b>24</b>	<b>11</b>	<b>24</b>	<b>12</b>	<b>36</b>	<b>0</b>	<b>0</b>

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CITY OF MILWAUKIE, CLACKAMAS COUNTY

OAK ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

1 - 4 of 36 Crash records shown.

SER#	P	R S W DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE							A	S									
INVEST	E A U C O DAY	RD DPT	FROM	SECOND STREET	DIRECT	OWNER	FROM	PRTC	INJ	G	E LICNS	PED											
UNLOC?	D C S L K LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
00608	N N N N N	02/21/2013	17	CLACKAMAS HY	INTER	CROSS	N	N	CLR	PED	01 NONE	0	TURN-R										18,19,14
	CITY	TH		OAK ST	NE		TRF SIGNAL	N	DRY	PED	PRVTE		NE-NW									000	00
N		6P			06	0		N	DARK	INJ	PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		000		000	00
N		45 26	-122 37	0171AD100S00														OR<25					
		36.1367879	47.1995399																				
										-			STRGHT	01	PED	INJB	26	F		I XWLK	020,055	035	18,19,14
													SE										
01741	N N N	05/18/2013	12	CLACKAMAS HY	INTER	CROSS	N	N	UNK	BIKE	01 NONE	0	TURN-R										02
	CITY	SA		OAK ST	NE		TRF SIGNAL	N	WET	TURN	PRVTE		SE-NE									000	00
N		5P			05	0		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		027		000	02
N		45 26	-122 37	017100100S00														OR<25					
		36.1367879	47.1995399																				
										-			STRGHT	01	BIKE	INJC	36	M		I XWLK	000	035	00
													NW										
00674	N N N N N	02/21/2012	12	CLACKAMAS HY	INTER	CROSS	N	N	CLD	S-1STOP	01 NONE	0	STRGHT										07
	CITY	TU		OAK ST	SE		TRF SIGNAL	N	WET	REAR	PRVTE		SE-NW									000	00
N		4P			06	0		N	DAY	PDO	PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		026,043		000	07
N		45 26	-122 37	017100100S00														OR<25					
		36.1368192	47.1996032								02 NONE	0	STOP									011	00
											PRVTE		SE-NW									000	00
											PSNGR CAR		01	DRVR	NONE	50	F	OR-Y		000		000	00
																		OR<25					
03513	N N N	09/21/2012	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	S-1STOP	01 NONE	0	STRGHT										07
	NONE	FR		OAK ST	SE		TRF SIGNAL	N	WET	REAR	PRVTE		SE-NW									000	00
N		6A			06	0		N	DAY	PDO	PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		026		000	07
N		45 26	-122 37	017100100S00														OR<25					
		36.1368192	47.1996032								02 NONE	0	STOP									011	00
											PRVTE		SE-NW									000	00
											PSNGR CAR		01	DRVR	NONE	60	F	OR-Y		000		000	00
																		OR<25					
00114	N N N N N	01/09/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	BIKE	01 NONE	0	STRGHT										19,18,04
	CITY	TH		OAK ST	SE		TRF SIGNAL	N	WET	ANGL	PRVTE		NW-SE									000	00
N		6P			05	0		N	DLIT	INJ	PSNGR CAR		01	DRVR	INJB	68	F	OR-Y		000		000	00
N		45 26	-122 37	017100100S00														OR<25					
		36.1367879	47.199576																				

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CITY OF MILWAUKIE, CLACKAMAS COUNTY

**OAK ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016**

20 - 24 of 36 Crash records shown.

SER#	S D					CLASS	CITY STREET	INT-TYPE	SPCL USE								PRTC	INJ	G E LICNS	PED	ERROR	ACT	EVENT	CAUSE		
	P	R	S	W	DATE				DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH									TRLR QTY	MOVE
INVEST	E	A	U	C	O DAY	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM											
RD DPT	E	L	G	H	R TIME	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC			
UNLOC?	D	C	S	L	K LAT																					
04441	N	N	N		11/19/2012	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	STRGHT									
NONE					MO		OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE		SW-NE							000		00
N					9P			04	0		N	DLIT	PDO		PSNGR CAR			01	DRVR	NONE	00	F	OR-Y	000	000	00
N					45 26 36.1368192	-122 37 47.1996032	017100100S00																			
														02	NONE	0	TURN-L									00
															PRVTE		NE-SE									00
															PSNGR CAR			01	DRVR	NONE	48	F	OR-Y	028,004	000	02
																										OR<25
00035	N	Y	Y	N	N	01/05/2013	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT								04
CITY					SA		OAK ST	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE		SW-NE							000		00
N					6P			02	0		N	DLIT	PDO		PSNGR CAR			01	DRVR	NONE	60	F	OR-Y	000	000	00
N					45 26 36.1367879	-122 37 47.1995399	017100100S00																			OR<25
														02	NONE	0	STRGHT									00
															PRVTE		SE-NW									00
															PSNGR CAR			01	DRVR	NONE	52	M	OR-Y	020	000	04
																										OR<25
01311	N	N	N	N	Y	04/17/2013	12	CLACKAMAS HY	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE	0	STRGHT								02
CITY					WE		OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE		SW-NE							000		00
N					4P			02	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	57	M	OR-Y	000	000	00
N					45 26 36.1367879	-122 37 47.1995399	017100100S00																			OR<25
														02	NONE	0	TURN-L									00
															PRVTE		NE-SE									00
															PSNGR CAR			01	DRVR	NONE	39	F	OR-Y	028,004	000	02
																										OR<25
01359	N	N	N		04/22/2013	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	STRGHT									02
NONE					MO		OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE		NW-SE							000		00
N					12P			03	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	00	F	UNK	000	000	00
N					45 26 36.1367879	-122 37 47.1995399	017100100S00																			UNK
														02	NONE	0	TURN-L									00
															PRVTE		SE-SW									00
															PSNGR CAR			01	DRVR	NONE	70	M	OR-Y	028,004	000	02
																										OR<25
01455	N	N	N	N	N	04/28/2013	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT								02
CITY					SU		OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE		SW-NE							000		00
N					2P			04	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	59	M	OR-Y	000	000	00
N					45 26 36.1367879	-122 37 47.1995399	017100100S00																			OR<25
														02	NONE	0	TURN-L									00
															PRVTE		NW-NE									00
															PSNGR CAR			01	DRVR	NONE	66	M	OR-Y	028,004	000	02
																										OR<25

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

EDISON ST at CLACKAMAS HY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2016</b>														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
<b>YEAR 2016 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2015</b>														
TURNING MOVEMENTS	0	2	2	4	0	2	0	2	2	2	2	4	0	0
<b>YEAR 2015 TOTAL</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2014</b>														
PEDESTRIAN	0	1	0	1	0	1	0	0	1	0	1	1	0	0
<b>YEAR 2014 TOTAL</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2013</b>														
ANGLE	0	1	0	1	0	2	0	0	1	1	0	1	0	0
REAR-END	0	1	1	2	0	1	0	1	0	1	1	2	0	0
<b>YEAR 2013 TOTAL</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2012</b>														
REAR-END	0	0	1	1	0	0	0	0	1	0	1	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
<b>YEAR 2012 TOTAL</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>FINAL TOTAL</b>	<b>0</b>	<b>6</b>	<b>5</b>	<b>11</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>11</b>	<b>0</b>	<b>0</b>

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

CLACKAMAS HY at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
FINAL TOTAL														

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

CLACKAMAS HY at NB EXTO 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
FINAL TOTAL														

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

EDISON ST at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2016</b>														
TURNING MOVEMENTS	0	1	1	2	0	1	0	1	1	2	0	2	0	0
<b>YEAR 2016 TOTAL</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2015</b>														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
<b>YEAR 2015 TOTAL</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2013</b>														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
<b>YEAR 2013 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>FINAL TOTAL</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>

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CITY OF MILWAUKIE, CLACKAMAS COUNTY

EDISON ST at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

1 - 4 of 4 Crash records shown.

SER#	P	R	S	W	DATE	CLASS	CITY STREET	INT-TYPE	RD CHAR	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	AS	P	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE
INVEST	E	A	U	C	O	DAY	FIRST STREET	(MEDIAN)	DIRECT	INT-REL	RNDBT	SURF	COLL	TRLR QTY	FROM	A	P								
RD DPT	E	L	G	H	R	TIME	SECOND STREET	LEGS	DIRECT	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	P	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE	
UNLOC?	D	C	S	L	K	LAT	LRS	(#LANES)	LOCTN	CONTL	DRVWY	LIGHT	SVRTY	V# TYPE	TO	P# TYPE	P	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE
02757	N	N	N		07/29/2013	12	EDISON ST	CROSS	INTER	N	N	CLR	ANGL-OTH	01 NONE 0	STRGHT								053	02	
NO RPT					MO		37TH AVE		CN			DRY	ANGL	PRVTE	S -N								015	00	
N					4P				04	0		DAY	PDO	PSNGR CAR		01	DRVR	NONE	58	F	OR-Y	028	000	02	
N					45 26 22.217892	-122 37 27.115608	0171AF100S00														OR<25				
														02 NONE 0	STRGHT										
														PRVTE	SW-NE										
														PSNGR CAR		01	DRVR	NONE	22	F	OR-Y	000	000	00	
																					OR<25				
01262	N	N	N		04/08/2015	19	EDISON ST	CROSS	INTER	N	N	CLR	S-OTHER	01 NONE 0	TURN-L										29
NONE					WE		37TH AVE		CN			DRY	TURN	UNKN	SW-N										00
N					4P				03	0		DAY	INJ	UNKNOWN		01	DRVR	NONE	00	Unk	UNK	026	000	29	
N					45 26 22.22	-122 37 27.12	0171AE100S00																		
														02 NONE 0	STOP										
														PRVTE	SW-N										
														PSNGR CAR		01	DRVR	INJC	47	M	OR-Y	000	000	00	
																					OR<25				
04430	N	N	N		09/29/2016	19	EDISON ST	CROSS	INTER	N	N	CLR	O-1 L-TURN	01 NONE 0	TURN-L										02
CITY					TH		37TH AVE		CN			DRY	TURN	PRVTE	SW-N										00
N					11A				02	0		DAY	INJ	PSNGR CAR		01	DRVR	NONE	21	F	OR-Y	028	000	02	
N					45 26 22.22	-122 37 27.12	0171AE100S00																		
														02 NONE 0	STRGHT										
														PRVTE	NE-SW										
														PSNGR CAR		01	DRVR	INJC	40	F	OR-Y	000	000	00	
																					OR<25				
05446	N	N	N		11/23/2016	19	EDISON ST	CROSS	INTER	N	N	RAIN	ANGL-OTH	01 NONE 9	STRGHT										02
NONE					WE		37TH AVE		CN			WET	TURN	N/A	SW-NE										00
N					4P				04	1		DAY	PDO	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00	
N					45 26 22.22	-122 37 27.12	0171AE100S00																		
														02 NONE 9	TURN-R										
														N/A	S -NE										
														PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00	

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

EDISON ST at INTERNATIONAL WAY, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
FINAL TOTAL														

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

INTERNATIONAL WAY at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2016</b>														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
<b>YEAR 2016 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2014</b>														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	2	0	2	0	0
<b>YEAR 2014 TOTAL</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2013</b>														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	1	0	0
<b>YEAR 2013 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2012</b>														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
<b>YEAR 2012 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>FINAL TOTAL</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>0</b>

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

INTERNATIONAL WAY at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

1 - 4 of 6 Crash records shown.

SER#	P	R	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	A	S									
INVEST	E	A	U	C	O	DAY	FIRST STREET	RD CHAR	(MEDIATE)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	A	S											
RD DPT	E	L	G	H	R	TIME	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E									
UNLOC?	D	C	S	L	K	LAT	LONG	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	PED	LOC	ERROR	ACT	EVENT	CAUSE
03319	N	N	N		09/06/2012	19	SE INTERNATIONAL WAY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT											07
NONE					TH	0	SE 37TH AVE	NE		STOP SIGN	N	DRY	REAR		PRVTE		SE-NW									000	00	
N					4P			09	1		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	54	M	OR-Y	026	000	07		
N					45 26		-122 37																OR<25					
					22.2178905		27.1156409								02	NONE	0	STOP									011	00
															PRVTE		SE-NW									000	000	00
															PSNGR CAR			01	DRVR	NONE	27	M	OR-Y	000	000	000	00	
																							OR<25					
03041	N	N	N	N	08/07/2014	19	SE INTERNATIONAL WAY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	STRGHT										02	
CITY					TH		SE 37TH AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE		E -W									015	00	
N					4P			02	1		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	33	M	OR-Y	028	000	02		
N					45 26		22.22 -122 37																OR<25					
					22.2178905		27.12								02	NONE	0	TURN-L									000	00
															PRVTE		W -N									000	00	
															PSNGR CAR			01	DRVR	NONE	17	M	OR-Y	000	000	000	00	
																							OR<25					
04907	N	N	N		12/18/2013	19	SE INTERNATIONAL WAY	INTER	CROSS	N	N	UNK	ANGL-OTH	01	NONE	0	STRGHT										03	
CITY					WE	0	SE 37TH AVE	CN		STOP SIGN	N	WET	ANGL		PRVTE		E -W									000	00	
N					6P			02	1		N	DARK	PDO		PSNGR CAR			01	DRVR	NONE	58	F	OR-Y	021	000	03		
N					45 26		-122 37																OR<25					
					22.217856		27.115608								02	NONE	0	STRGHT									015	00
															PRVTE		S -N									000	00	
															PSNGR CAR			01	DRVR	NONE	52	M	OR-Y	000	000	000	00	
																							OR<25					
02068	N	N	N		05/30/2014	19	SE INTERNATIONAL WAY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	TURN-L										02	
NONE					FR	0	SE 37TH AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE		N -E									015	00	
N					9A			04	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	68	M	OR-Y	028	000	02		
N					45 26		-122 37																OR<25					
					22.217856		27.12								02	NONE	0	TURN-R									000	00
															PRVTE		S -E									000	00	
															PSNGR CAR			01	DRVR	NONE	44	F	OR-Y	000	000	000	00	
																							OR<25					
02231	N	N	N		06/10/2014	19	SE INTERNATIONAL WAY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT										02	
NONE					TU	0	SE 37TH AVE	CN		STOP SIGN	N	DRY	ANGL		PRVTE		E -W									015	00	
N					3P			02	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	41	F	OR-Y	028	000	02		
N					45 26		-122 37																OR<25					
					22.217856		27.12								02	NONE	0	STRGHT									015	00
															PRVTE		S -N									000	00	
															PSNGR CAR			01	DRVR	NONE	26	M	OR-Y	000	000	000	00	
																							OR<25					

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CITY OF MILWAUKIE, CLACKAMAS COUNTY

**INTERNATIONAL WAY at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016**

5 - 6 of 6 Crash records shown.

SER#	P	R S W	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	SPCL USE	MOVE	INJ	RES	PED	ACT	EVENT	CAUSE
INVEST	E A U C O DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD WTHR	CRASH	TRLR QTY	MOVE	A S				
RD DPT	E L G H R TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT SURF	COLL	OWNER	FROM	PRTC	INJ	G E LICNS	PED	
UNLOC?	D C S L K LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY LIGHT	SVRTY	V# TYPE	TO	P# TYPE	SVRTY	E X RES	LOC	ERROR
									02 NONE 0	STRGHT					
									PRVTE S -N						015 00
									PSNGR CAR		02 PSNG	NO<5	01 M		000 000
00335	N N N		01/19/2016	12	SE INTERNATIONAL WAY	INTER	CROSS	N	N	RAIN	ANGL-OTH	01 NONE 9	TURN-L		02
NONE		TU		0	SE 37TH AVE	CN		STOP SIGN	N	WET	TURN	N/A	N -E		015 00
N		6A				03	1		N	DLIT	PDO	PSNGR CAR		01 DRVR	NONE 00 Unk UNK 000 000
N		45 26 22.22		-122 37 27.12											000 000
									02 NONE 9	STRGHT					
									N/A W -E						000 00
									PSNGR CAR		01 DRVR	NONE 00	Unk UNK UNK		000 000

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

HARRISON ST at 32ND AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2016</b>														
ANGLE	0	2	0	2	0	5	0	1	1	1	1	2	0	0
TURNING MOVEMENTS	0	2	0	2	0	2	0	1	1	2	0	2	0	0
<b>YEAR 2016 TOTAL</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2015</b>														
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	1	1	2	0	0
<b>YEAR 2015 TOTAL</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2014</b>														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	0	1	0	1	1	0	0
<b>YEAR 2014 TOTAL</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2013</b>														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	1	0	1	0	1
TURNING MOVEMENTS	0	1	1	2	0	3	0	2	0	2	0	2	0	0
<b>YEAR 2013 TOTAL</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>
<b>YEAR: 2012</b>														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	1	0	1	0	0
<b>YEAR 2012 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>FINAL TOTAL</b>	<b>0</b>	<b>7</b>	<b>5</b>	<b>12</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>8</b>	<b>4</b>	<b>9</b>	<b>3</b>	<b>12</b>	<b>0</b>	<b>1</b>

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

HARRISON ST at 32ND AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

1 - 5 of 12 Crash records shown.

SER#	S D	P R S W DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	RD CHAR	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	A S					
INVEST	E A U C O DAY	TH	DIST	FIRST STREET	(MEDIAN)	TYPE	DIRECT	INT-REL	RNDBT	SURF	COLL	OWNER	FROM	G E LICNS	PED				
RD DPT	E L G H R TIME	FROM	FROM	SECOND STREET	LEGS	TRAF-	DIRECT	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ				
UNLOC?	D C S L K LAT	LONG	LONG	LRS	(#LANES)	CONTL	LOCTN	(#LANES)	DRVWY	LIGHT	SVRTY	V# TYPE	TO	P# TYPE	SVRTY				
02423	N N N N N	06/19/2015	16	HARRISON ST	CROSS	N	INTER	N	N	CLD	O-1 L-TURN	01 NONE 0	TURN-L						
CITY		FR	0	32ND AVE			NE		N	DRY	TURN	PRVTE	N -E		000	00			
N		10P					06	0	N	DLIT	PDO	PSNGR CAR	01 DRVR	NONE	34 M	OTH-Y	028	000	02
N		45 26 47.73	-122 37 46.89																
												02 NONE 0	STRGHT						
												PRVTE	S -N				000		00
												PSNGR CAR	01 DRVR	NONE	18 M	OR-Y	000	000	00
01651	N N N N N	05/13/2013	16	HARRISON ST	CROSS	N	INTER	N	Y	CLR	FIX OBJ	01 NONE 0	TURN-R						
NONE		MO	0	32ND AVE			W		N	DRY	FIX	PRVTE	W -S		000 055	00			
N		5P					06	0	N	DAY	PDO	MOTRHOME	01 DRVR	NONE	54 M	OR-Y	002	000	08
N		45 26 47.7304439	-122 37 46.890228																
02153	N N N	06/05/2014	16	HARRISON ST	CROSS	N	INTER	N	N	CLR	S-1STOP	01 NONE 0	STRGHT						
NONE		TH	0	32ND AVE			W		N	DRY	REAR	PRVTE	W -E		000	00			
N		2P					06	0	N	DAY	INJ	PSNGR CAR	01 DRVR	NONE	60 M	OR-Y	026	000	29
N		45 26 47.73 46.89	-122 37 46.89																
												02 NONE 0	STOP						
												PRVTE	W -E				011	000	00
												PSNGR CAR	01 DRVR	INJC	34 M	OR-Y	000	000	00
00904	N N N	03/10/2012	17	HARRISON ST	CROSS	N	INTER	N	N	UNK	S-OTHER	01 NONE 0	TURN-R						
NONE		SA	0	32ND AVE			CN		N	WET	TURN	UNKN	N -W		000	00			
N		5P					01	0	N	DAY	PDO	PSNGR CAR	01 DRVR	NONE	00 F	UNK	006	000	08
N		45 26 47.7304521	-122 37 46.890241																
												02 NONE 0	TURN-R						
												PRVTE	N -W				000		00
												PSNGR CAR	01 DRVR	NONE	55 F	OR-Y	000	000	00
												02 NONE 0	TURN-R						00
												PRVTE	N -W				000		00
												PSNGR CAR	02 PSNG	NO<5	02 F		000	000	00
00692	N N N	02/27/2013	16	HARRISON ST	CROSS	N	INTER	N	N	CLR	O-1 L-TURN	01 NONE 0	STRGHT						
NONE		WE	0	32ND AVE			CN		N	DRY	TURN	PRVTE	S -N		000	00			
N		3P					04	0	N	DAY	PDO	PSNGR CAR	01 DRVR	NONE	63 F	OR-Y	000	000	00
N		45 26 47.7304439	-122 37 46.890228																
												02 NONE 0	TURN-L						
												PRVTE	N -E				000		00
												PSNGR CAR	01 DRVR	NONE	17 F	OR-Y	028,004	000	02

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

HARRISON ST at 32ND AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

6 - 8 of 12 Crash records shown.

SER#	P	R	S	W	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	SPCL USE	MOVE	A	S	INJ	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE						
INVEST	E	A	U	C	O	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	A	S	INJ	G	E	LICNS	PED					
RD DPT	E	L	G	H	R	TIME	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE			
UNLOC?	D	C	S	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
01512	N	N	N	N	N	05/02/2013	16	HARRISON ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	STRGHT									02,05	
CITY					TH	0	32ND AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S										000	00	
N					6P			03		0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	48	F	OR-Y	000	000	00	
N					45 26	-122 37																						
					47.7304439	46.890228																						
																01	NONE	0	STRGHT									
																PRVTE	N -S										000	00
																PSNGR CAR			02	PSNG	INJB	49	M			000	000	00
																02	NONE	0	TURN-L								000	00
																PRVTE	S -W										000	00
																PSNGR CAR			01	DRVR	INJB	46	F	OR-Y	028,004	000	000	02
01294	N	N	N	N	N	04/03/2014	16	HARRISON ST	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE	0	TURN-L									04	
CITY					TH	0	32ND AVE	CN		TRF SIGNAL	N	WET	TURN		PRVTE	E -S											000	00
N					7P			03		0		N	DLIT	INJ		PSNGR CAR			01	DRVR	INJC	22	M	OR-Y	000	000	00	
N					45 26	-122 37																						
					47.7304439	46.890228																						
																02	NONE	0	STRGHT									
																PRVTE	W -E										000	00
																PSNGR CAR			01	DRVR	NONE	40	F	OR-Y	020	000	000	04
04096	N	N	N			10/05/2015	16	HARRISON ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	TURN-R									02	
NONE					MO	0	32ND AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E -N											000	00
N					10A			02		0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	61	F	OR-Y	028	000	00	
N					45 26	47.73 -122 37																						
					46.89																							
																02	NONE	0	STRGHT									
																PRVTE	S -N										000	00
																PSNGR CAR			01	DRVR	NONE	41	F	OR-Y	000	000	000	00
00702	N	N	N	N	N	02/12/2016	16	HARRISON ST	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	0	STRGHT									04	
CITY					FR	0	32ND AVE	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	N -S											000	00
N					5P			01		0		N	DUSK	INJ		PSNGR CAR			01	DRVR	INJC	28	F	OR-Y	000	000	00	
N					45 26	47.73 -122 37																						
					46.89																							
																02	NONE	0	STRGHT									
																PRVTE	E -W										000	00
																PSNGR CAR			01	DRVR	INJC	37	M	OR-Y	020	000	000	04
																02	NONE	0	STRGHT									
																PRVTE	E -W										000	00
																PSNGR CAR			02	PSNG	INJB	29	F	OR<25	000	000	000	00

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE  
 OAK ST at RAILROAD AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
FINAL TOTAL														

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE  
OAK ST at 32ND AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
FINAL TOTAL														

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OAK ST at MONROE ST, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2016</b>														
TURNING MOVEMENTS	0	0	2	2	0	0	0	0	2	2	0	2	0	0
<b>YEAR 2016 TOTAL</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2014</b>														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	0	1	1	0	1
<b>YEAR 2014 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>YEAR: 2013</b>														
MISCELLANEOUS	0	1	0	1	0	1	0	0	1	0	1	1	0	0
PEDESTRIAN	0	1	0	1	0	1	0	1	0	0	1	1	0	0
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
<b>YEAR 2013 TOTAL</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>FINAL TOTAL</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>0</b>	<b>1</b>

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CITY OF MILWAUKIE, CLACKAMAS COUNTY

OAK ST at MONROE ST, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

6 - 6 of 6 Crash records shown.

SER#	P	R	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	A	S																	
INVEST	E	A	U	C	O DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	PRTC	INJ	G	E	LICNS	PED							
RD DPT	E	L	G	H	R TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE		
UNLOC?	D	C	S	L	K LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
									02	NONE	9		TURN-R															
										N/A			SW-SE														015	00
										PSNGR	CAR						01	DRVR	NONE	00	Unk	UNK		000	000		00	

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE  
MONROE ST at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2015</b>														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
<b>YEAR 2015 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2014</b>														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
<b>YEAR 2014 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>FINAL TOTAL</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>

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

CITY OF MILWAUKIE, CLACKAMAS COUNTY

MONROE ST at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

1 - 2 of 2 Crash records shown.

SER#	P	R	S	W	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	SPCL USE	S D																			
											INVEST	E	A	U	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	A	S
RD DPT	E	L	G	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED								
UNLOC?	D	C	S	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE		
03029	N	N	N		07/27/2015	17	MONROE ST	INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE	0	TURN-L													
NONE					MO	0	37TH AVE	W			STOP SIGN	N	DRY	TURN	PRVTE	S -W										000		00		
N					7A			06	0			N	DAY	PDO	PSNGR CAR		01	DRVR	NONE	28	F	OR-Y		002		000		08		
N					45 26 42.7		-122 37 28.15								02	NONE	0	STOP												
															PRVTE	W -E											011		00	
															PSNGR CAR		01	DRVR	NONE	54	M	OR-Y		000		000		00		
05178	N	Y	N	N	N	12/21/2014	17	MONROE ST	INTER	CROSS	N	N	CLD	ANGL-STP	01	NONE	0	TURN-R												
NONE					SU	0	37TH AVE	CN			STOP SIGN	N	WET	TURN	PRVTE	S -E										000		00		
N					6P			02	0			N	DLIT	PDO	PSNGR CAR		01	DRVR	NONE	52	F	OR-Y		001		000		08		
N					45 26 42.7		-122 37 28.15								02	NONE	0	STOP												
															PRVTE	E -W											012		00	
															PSNGR CAR		01	DRVR	NONE	53	F	OR-Y		000		000		00		

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

WASHINGTON ST at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2015</b>														
BACKING	0	0	1	1	0	0	1	1	0	1	0	1	0	0
<b>YEAR 2015 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>FINAL TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

RAILROAD AVE at 37TH AVE, City of Milwaukie, Clackamas County, 01/01/2012 to 12/31/2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
<b>YEAR: 2014</b>														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	1	0	1	0	0
<b>YEAR 2014 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>YEAR: 2012</b>														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
<b>YEAR 2012 TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>FINAL TOTAL</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>

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## Left-Turn Lane Warrant Analysis

Project: Monroe Apartments  
 Intersection: SE Washington Street at SE 37th Avenue  
 Date: 4/18/2019  
 Scenario: 2022 Buildout Conditions - AM Peak Hour (NB)

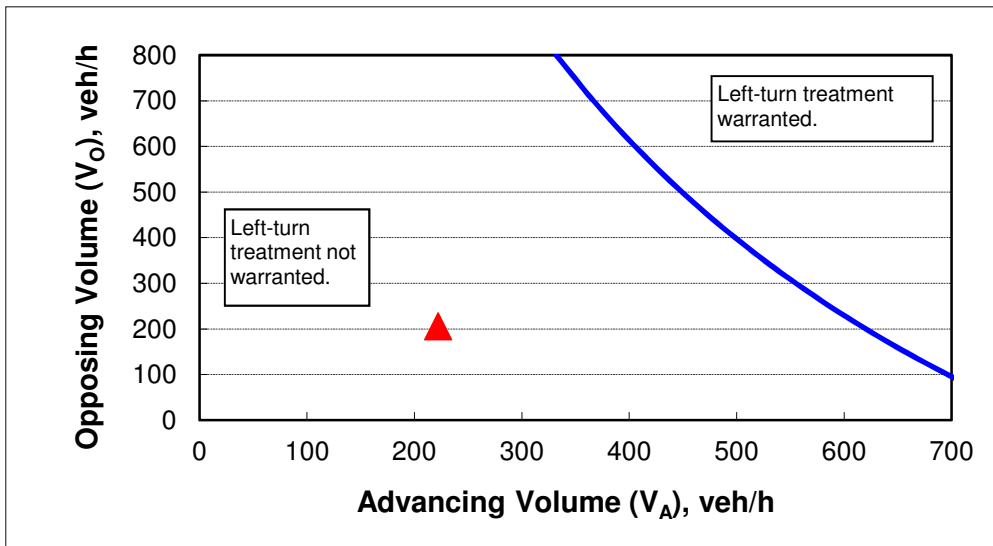
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	35
Percent of left-turns in advancing volume ( $V_A$ ), %:	6%
Advancing volume ( $V_A$ ), veh/h:	222
Opposing volume ( $V_O$ ), veh/h:	205

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	617
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

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

## Left-Turn Lane Warrant Analysis

Project: Monroe Apartments  
 Intersection: SE Washington Street at SE 37th Avenue  
 Date: 4/18/2019  
 Scenario: 2022 Buildout Conditions - AM Peak Hour (SB)

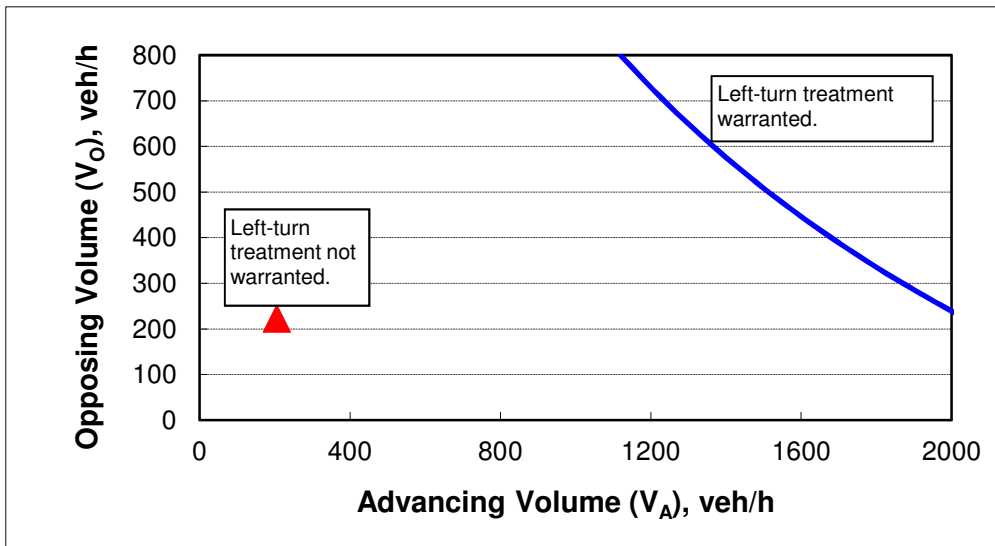
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	35
Percent of left-turns in advancing volume ( $V_A$ ), %:	0%
Advancing volume ( $V_A$ ), veh/h:	205
Opposing volume ( $V_O$ ), veh/h:	222

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	2039
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

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

## Left-Turn Lane Warrant Analysis

Project: Monroe Apartments  
 Intersection: SE Washington Street at SE 37th Avenue  
 Date: 4/18/2019  
 Scenario: 2022 Buildout Conditions - PM Peak Hour (NB)

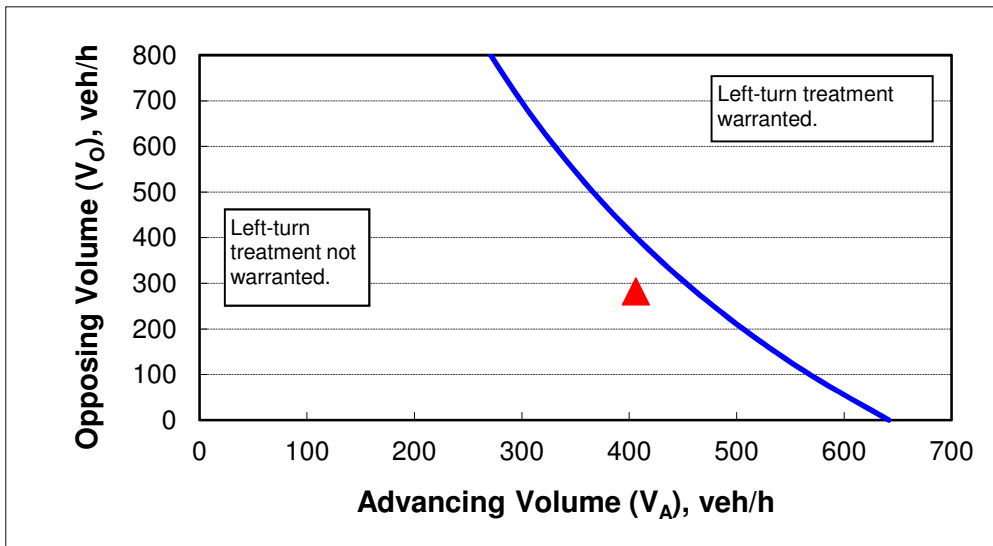
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	35
Percent of left-turns in advancing volume ( $V_A$ ), %:	9%
Advancing volume ( $V_A$ ), veh/h:	406
Opposing volume ( $V_O$ ), veh/h:	282

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	462
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

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



## Left-Turn Lane Warrant Analysis



Project: Monroe Apartments  
 Intersection: SE Washington Street at SE 37th Avenue  
 Date: 4/18/2019  
 Scenario: 2022 Buildout Conditions - PM Peak Hour (SB)

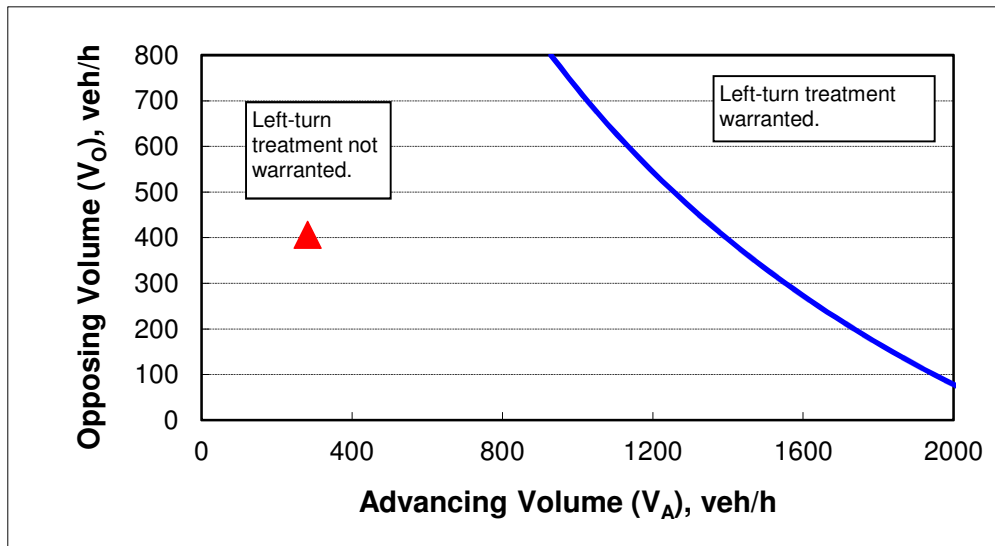
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	35
Percent of left-turns in advancing volume ( $V_A$ ), %:	1%
Advancing volume ( $V_A$ ), veh/h:	282
Opposing volume ( $V_O$ ), veh/h:	406

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	1386
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

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

# Traffic Signal Warrant Analysis



Project: Monroe Apartments  
 Date: 4/18/2019  
 Scenario: 2022 Buildout Conditions

Major Street: SE Edison St/Inter. Way      Minor Street: SE 37th Avenue  
 Number of Lanes: 1      Number of Lanes: 1  
 PM Peak Hour Volumes: 582      PM Peak Hour Volumes: 206

Warrant Used:  
    X     100 percent of standard warrants used  
           70 percent of standard warrants used due to 85th percentile speed in excess  
           of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	5,820	8,850	
Minor Street*	2,060	2,650	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	5,820	13,300	
Minor Street*	2,060	1,350	<b>No</b>
<i>Combination Warrant</i>			
Major Street	5,820	10,640	
Minor Street*	2,060	2,120	<b>No</b>

Note: Minor street right-turning traffic volumes reduced by 25%.

# Traffic Signal Warrant Analysis



Project: Monroe Apartments  
 Date: 4/18/2019  
 Scenario: 2022 Buildout Conditions

Major Street:	SE Oak Street	Minor Street:	SE Monroe Street
Number of Lanes:	2	Number of Lanes:	1
PM Peak Hour Volumes:	494	PM Peak Hour Volumes:	288

Warrant Used:  
 100 percent of standard warrants used  
 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	4,940	10,600	
Minor Street*	2,880	2,650	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	4,940	15,900	
Minor Street*	2,880	1,350	<b>No</b>
<i>Combination Warrant</i>			
Major Street	4,940	12,720	
Minor Street*	2,880	2,120	<b>No</b>

Note: Minor street right-turning traffic volumes reduced by 25%.

# Traffic Signal Warrant Analysis



Project: Monroe Apartments  
 Date: 4/18/2019  
 Scenario: 2022 Buildout Conditions

Major Street:	SE Monroe Street	Minor Street:	SE 37th Avenue
Number of Lanes:	1	Number of Lanes:	2
PM Peak Hour Volumes:	701	PM Peak Hour Volumes:	351

Warrant Used:  
    X     100 percent of standard warrants used  
           70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	7,010	8,850	
Minor Street*	3,510	3,550	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	7,010	13,300	
Minor Street*	3,510	1,750	<b>No</b>
<i>Combination Warrant</i>			
Major Street	7,010	10,640	
Minor Street*	3,510	2,840	<b>No</b>

Note: Minor street right-turning traffic volumes reduced by 25%.

# Traffic Signal Warrant Analysis



Project: Monroe Apartments  
 Date: 4/18/2019  
 Scenario: 2022 Buildout Conditions

Major Street: SE Washington Street      Minor Street: SE 37th Avenue  
 Number of Lanes: 1      Number of Lanes: 2  
 PM Peak Hour Volumes: 688      PM Peak Hour Volumes: 33

Warrant Used:  
    X     100 percent of standard warrants used  
           70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	6,880	8,850	
Minor Street*	330	3,550	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	6,880	13,300	
Minor Street*	330	1,750	<b>No</b>
<i>Combination Warrant</i>			
Major Street	6,880	10,640	
Minor Street*	330	2,840	<b>No</b>

Note: Minor street right-turning traffic volumes reduced by 25%.

# Traffic Signal Warrant Analysis



Project: Monroe Apartments  
 Date: 4/18/2019  
 Scenario: 2022 Buildout Conditions

Major Street:	SE 37th Avenue	Minor Street:	SE Railroad Avenue
Number of Lanes:	1	Number of Lanes:	2
PM Peak Hour Volumes:	834	PM Peak Hour Volumes:	182

Warrant Used:  
 100 percent of standard warrants used  
 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	8,340	8,850	
Minor Street*	1,820	3,550	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	8,340	13,300	
Minor Street*	1,820	1,750	<b>No</b>
<i>Combination Warrant</i>			
Major Street	8,340	10,640	
Minor Street*	1,820	2,840	<b>No</b>

Note: Minor street right-turning traffic volumes reduced by 25%.



## LEVEL OF SERVICE

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

*Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

*Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

*Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

*Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

*Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

*Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

*LEVEL OF SERVICE CRITERIA  
FOR SIGNALIZED INTERSECTIONS*

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

*LEVEL OF SERVICE CRITERIA  
FOR UNSIGNALIZED INTERSECTIONS*





















LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50



# HCM Signalized Intersection Capacity Analysis

## 1: OR-224 & SE Harrison Street

















04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	118	39	38	175	290	56	1755	54	88	865	13
Future Volume (vph)	18	118	39	38	175	290	56	1755	54	88	865	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		1.00			0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3018			3132		1719	3438	1538	1703	3406	1524
Flt Permitted		0.79			0.91		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2386			2867		1719	3438	1538	1703	3406	1524
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	19	127	42	41	188	312	60	1887	58	95	930	14
RTOR Reduction (vph)	0	30	0	0	111	0	0	0	24	0	0	6
Lane Group Flow (vph)	0	158	0	0	430	0	60	1887	34	95	930	8
Confl. Peds. (#/hr)	2						2					
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		16.8			16.8		6.7	52.9	52.9	6.8	53.0	53.0
Effective Green, g (s)		16.8			16.8		6.7	52.9	52.9	6.8	53.0	53.0
Actuated g/C Ratio		0.19			0.19		0.07	0.59	0.59	0.08	0.59	0.59
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		445			535		127	2020	904	128	2005	897
v/s Ratio Prot							0.03	c0.55		c0.06	0.27	
v/s Ratio Perm		0.07			c0.15				0.02			0.01
v/c Ratio		0.35			0.80		0.47	0.93	0.04	0.74	0.46	0.01
Uniform Delay, d1		31.9			35.0		40.0	17.0	7.8	40.7	10.5	7.6
Progression Factor		1.00			1.00		1.13	0.57	0.63	1.00	1.00	1.00
Incremental Delay, d2		0.5			8.5		2.0	7.4	0.1	20.5	0.8	0.0
Delay (s)		32.4			43.5		47.2	17.0	5.0	61.2	11.2	7.7
Level of Service		C			D		D	B	A	E	B	A
Approach Delay (s)		32.4			43.5			17.6			15.8	
Approach LOS		C			D			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.5				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			88.8%				ICU Level of Service				E	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
2: OR-224 & SE Monroe Street

























04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	9	56	5	17	23	39	1818	13	5	925	15
Future Volume (vph)	30	9	56	5	17	23	39	1818	13	5	925	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1687			1711		1719	3438	1504	1687	3374	1509
Flt Permitted		0.91			0.96		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1560			1646		1719	3438	1504	1687	3374	1509
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	32	10	60	5	18	24	41	1934	14	5	984	16
RTOR Reduction (vph)	0	55	0	0	22	0	0	0	3	0	0	5
Lane Group Flow (vph)	0	47	0	0	25	0	41	1934	11	5	984	11
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		7.3			7.3		5.2	67.9	67.9	1.3	64.0	64.0
Effective Green, g (s)		7.3			7.3		5.2	67.9	67.9	1.3	64.0	64.0
Actuated g/C Ratio		0.08			0.08		0.06	0.75	0.75	0.01	0.71	0.71
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		126			133		99	2593	1134	24	2399	1073
v/s Ratio Prot							c0.02	c0.56		0.00	0.29	
v/s Ratio Perm		c0.03			0.02				0.01			0.01
v/c Ratio		0.37			0.19		0.41	0.75	0.01	0.21	0.41	0.01
Uniform Delay, d1		39.2			38.6		40.9	6.2	2.7	43.8	5.3	3.8
Progression Factor		1.00			1.00		1.03	0.62	1.00	1.14	0.40	1.00
Incremental Delay, d2		1.8			0.7		2.0	1.4	0.0	3.9	0.5	0.0
Delay (s)		41.0			39.3		44.0	5.3	2.7	53.8	2.6	3.8
Level of Service		D			D		D	A	A	D	A	A
Approach Delay (s)		41.0			39.3			6.1			2.9	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			6.7				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			70.2%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: SE Oak Street & OR-224





















04/12/2019

													
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR	
Lane Configurations													
Traffic Volume (vph)	46	159	82	75	259	182	83	892	16	130	1600	158	
Future Volume (vph)	46	159	82	75	259	182	83	892	16	130	1600	158	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1711	3438	1511	1711	3438	1520	1719	3438	1538	1703	3406	1489	
Flt Permitted	0.50	1.00	1.00	0.65	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	894	3438	1511	1169	3438	1520	1719	3438	1538	1703	3406	1489	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	
Adj. Flow (vph)	47	162	84	77	264	186	85	910	16	133	1633	161	
RTOR Reduction (vph)	0	0	72	0	0	56	0	0	7	0	0	47	
Lane Group Flow (vph)	47	162	12	77	264	130	85	910	9	133	1633	114	
Confl. Peds. (#/hr)	5		4	4		5	1					1	
Confl. Bikes (#/hr)						1							
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%	6%	
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases		4			8	5	2			1	6		
Permitted Phases	4		4	8		8			2			6	
Actuated Green, G (s)	12.6	12.6	12.6	12.6	12.6	21.4	8.8	52.2	52.2	11.7	55.1	55.1	
Effective Green, g (s)	12.6	12.6	12.6	12.6	12.6	21.4	8.8	52.2	52.2	11.7	55.1	55.1	
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.24	0.10	0.58	0.58	0.13	0.61	0.61	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	125	481	211	163	481	437	168	1994	892	221	2085	911	
v/s Ratio Prot		0.05			c0.08	0.03	0.05	0.26		c0.08	c0.48		
v/s Ratio Perm	0.05		0.01	0.07		0.06			0.01			0.08	
v/c Ratio	0.38	0.34	0.06	0.47	0.55	0.30	0.51	0.46	0.01	0.60	0.78	0.13	
Uniform Delay, d1	35.1	34.9	33.5	35.6	36.1	28.1	38.5	10.8	8.0	37.0	13.0	7.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.94	0.62	1.00	0.60	1.68	3.18	
Incremental Delay, d2	1.9	0.4	0.1	2.2	1.3	0.4	2.3	0.7	0.0	2.4	1.6	0.1	
Delay (s)	37.0	35.3	33.7	37.8	37.3	28.5	38.6	7.5	8.0	24.7	23.5	23.4	
Level of Service	D	D	C	D	D	C	D	A	A	C	C	C	
Approach Delay (s)		35.1			34.3			10.1			23.6		
Approach LOS		D			C			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			22.3									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.74										
Actuated Cycle Length (s)			90.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			76.4%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

# HCM Signalized Intersection Capacity Analysis

## 4: OR-224 & SE Edison Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	50	23	59	29	122	7	1757	0	106	914	18
Future Volume (vph)	16	50	23	59	29	122	7	1757	0	106	914	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00	0.88	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		0.97			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1758			1735	2621	1719	3438		1687	3374	1509
Flt Permitted		0.93			0.72	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1652			1291	2621	1719	3438		1687	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	53	24	62	31	128	7	1849	0	112	962	19
RTOR Reduction (vph)	0	15	0	0	0	112	0	0	0	0	0	6
Lane Group Flow (vph)	0	79	0	0	93	16	7	1849	0	112	962	13
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	5%	5%	5%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)		11.2			11.2	11.2	1.4	54.7		10.6	63.9	63.9
Effective Green, g (s)		11.2			11.2	11.2	1.4	54.7		10.6	63.9	63.9
Actuated g/C Ratio		0.12			0.12	0.12	0.02	0.61		0.12	0.71	0.71
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		205			160	326	26	2089		198	2395	1071
v/s Ratio Prot							0.00	c0.54		c0.07	0.29	
v/s Ratio Perm		0.05			c0.07	0.01						0.01
v/c Ratio		0.39			0.58	0.05	0.27	0.89		0.57	0.40	0.01
Uniform Delay, d1		36.2			37.2	34.7	43.8	15.0		37.5	5.3	3.8
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.79	2.08	1.00
Incremental Delay, d2		1.2			5.3	0.1	5.5	6.0		3.4	0.5	0.0
Delay (s)		37.4			42.5	34.8	49.3	20.9		32.9	11.5	3.8
Level of Service		D			D	C	D	C		C	B	A
Approach Delay (s)		37.4			38.0			21.0			13.5	
Approach LOS		D			D			C			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.1									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			90.0								13.5	Sum of lost time (s)
Intersection Capacity Utilization			77.3%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 5: SE 37th Avenue & SE Edison Street/SE International Way

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↘			↕	↗
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	42	113	0	0	41	43	0	86	40	114	0	165
Future Volume (vph)	42	113	0	0	41	43	0	86	40	114	0	165
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	50	135	0	0	49	51	0	102	48	136	0	196

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total (vph)	185	25	25	51	150	201	131
Volume Left (vph)	50	0	0	0	0	136	0
Volume Right (vph)	0	0	0	51	48	65	131
Hadj (s)	0.12	0.24	0.24	-0.46	-0.16	-0.04	-0.58
Departure Headway (s)	5.1	5.8	5.8	3.2	4.6	4.7	3.2
Degree Utilization, x	0.26	0.04	0.04	0.05	0.19	0.26	0.12
Capacity (veh/h)	670	568	569	1121	733	727	1121
Control Delay (s)	9.8	7.8	7.8	5.2	8.7	9.3	6.6
Approach Delay (s)	9.8	6.5			8.7	8.2	
Approach LOS	A	A			A	A	

Intersection Summary

Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis  
6: SE 32nd Avenue & SE Harrison Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	102	116	6	20	365	18	34	132	15	15	108	112	
Future Volume (vph)	102	116	6	20	365	18	34	132	15	15	108	112	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00	
Satd. Flow (prot)	1656	1731		1752	1830			1826	1524		1764	1473	
Flt Permitted	0.95	1.00		0.95	1.00			0.91	1.00		0.95	1.00	
Satd. Flow (perm)	1656	1731		1752	1830			1674	1524		1682	1473	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	110	125	6	22	392	19	37	142	16	16	116	120	
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	13	0	0	97	
Lane Group Flow (vph)	110	129	0	22	409	0	0	179	3	0	132	23	
Confl. Peds. (#/hr)	4					4			5	5			
Confl. Bikes (#/hr)												2	
Heavy Vehicles (%)	9%	9%	9%	3%	3%	3%	3%	3%	3%	7%	7%	7%	
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	5	2		1	6			4			8		
Permitted Phases							4		4	8		8	
Actuated Green, G (s)	7.5	33.6		1.4	27.5			11.5	11.5		11.5	11.5	
Effective Green, g (s)	7.5	33.6		1.4	27.5			11.5	11.5		11.5	11.5	
Actuated g/C Ratio	0.12	0.56		0.02	0.46			0.19	0.19		0.19	0.19	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	207	969		40	838			320	292		322	282	
v/s Ratio Prot	c0.07	0.07		0.01	c0.22								
v/s Ratio Perm								c0.11	0.00		0.08	0.02	
v/c Ratio	0.53	0.13		0.55	0.49			0.56	0.01		0.41	0.08	
Uniform Delay, d1	24.6	6.3		29.0	11.3			22.0	19.6		21.3	19.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	0.3		15.3	2.0			2.1	0.0		0.9	0.1	
Delay (s)	27.2	6.6		44.3	13.4			24.1	19.7		22.1	20.0	
Level of Service	C	A		D	B			C	B		C	C	
Approach Delay (s)		16.0			14.9			23.7			21.1		
Approach LOS		B			B			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			18.1		HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio			0.51										
Actuated Cycle Length (s)			60.0		Sum of lost time (s)					13.5			
Intersection Capacity Utilization			55.5%		ICU Level of Service					B			
Analysis Period (min)			15										
c Critical Lane Group													

7: SE Oak Street & SE Monroe Street Performance by approach


















Approach	NB	SE	NW	All
Denied Delay (hr)	0.1	0.0	0.0	0.2
Denied Del/Veh (s)	2.1	0.2	0.4	0.8
Total Delay (hr)	0.0	0.3	1.1	1.4
Total Del/Veh (s)	0.4	6.2	10.0	6.5
Stop Delay (hr)	0.0	0.2	0.8	1.0
Stop Del/Veh (s)	0.0	5.3	7.2	4.8
Total Stops	2	158	395	555
Stop/Veh	0.01	0.99	1.00	0.71
Vehicles Entered	219	159	394	772
Vehicles Exited	220	159	394	773
Hourly Exit Rate	220	159	394	773
Input Volume	221	162	391	774
% of Volume	100	98	101	100
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Total Network Performance

Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.8
Total Delay (hr)	1.6
Total Del/Veh (s)	7.2
Stop Delay (hr)	1.1
Stop Del/Veh (s)	5.1
Total Stops	555
Stop/Veh	0.71
Vehicles Entered	772
Vehicles Exited	773
Hourly Exit Rate	773
Input Volume	1547
% of Volume	50
Denied Entry Before	0
Denied Entry After	0

HCM Unsignalized Intersection Capacity Analysis  
 8: SE 37th Avenue & SE Monroe Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	92	71	55	213	1	143	36	42	1	57	28
Future Volume (vph)	4	92	71	55	213	1	143	36	42	1	57	28
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	103	80	62	239	1	161	40	47	1	64	31
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	187	302	161	87	96							
Volume Left (vph)	4	62	161	0	1							
Volume Right (vph)	80	1	0	47	31							
Hadj (s)	-0.17	0.09	0.57	-0.31	-0.11							
Departure Headway (s)	5.2	5.3	6.5	5.6	5.7							
Degree Utilization, x	0.27	0.44	0.29	0.14	0.15							
Capacity (veh/h)	638	647	517	592	563							
Control Delay (s)	10.1	12.4	11.0	8.3	9.7							
Approach Delay (s)	10.1	12.4	10.1		9.7							
Approach LOS	B	B	B		A							
Intersection Summary												
Delay			10.9									
Level of Service			B									
Intersection Capacity Utilization			48.8%	ICU Level of Service	A							
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis  
 9: SE 37th Avenue & SE Washington Street

04/12/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	3	194	3	1	185
Future Volume (Veh/h)	9	3	194	3	1	185
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	10	3	220	3	1	210
Pedestrians	1		1			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	3.5		3.5			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	436	222			224	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	436	222			224	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	580	821			1355	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	13	223	211			
Volume Left	10	0	1			
Volume Right	3	3	0			
cSH	622	1700	1355			
Volume to Capacity	0.02	0.13	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	10.9	0.0	0.0			
Lane LOS	B		A			
Approach Delay (s)	10.9	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			20.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: SE 37th Avenue & SE Railroad Avenue

04/12/2019























Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	147	136	79	29	57	139
Future Volume (Veh/h)	147	136	79	29	57	139
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	162	149	87	32	63	153
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)	1					
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	382	104			119	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	382	104			119	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	84			96	
cM capacity (veh/h)	594	950			1463	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	311	119	216			
Volume Left	162	0	63			
Volume Right	149	32	0			
cSH	932	1700	1463			
Volume to Capacity	0.33	0.07	0.04			
Queue Length 95th (ft)	37	0	3			
Control Delay (s)	10.8	0.0	2.5			
Lane LOS	B		A			
Approach Delay (s)	10.8	0.0	2.5			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			6.0			
Intersection Capacity Utilization			32.1%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

















## 1: OR-224 & SE Harrison Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	253	55	54	178	153	61	1433	65	279	1711	30
Future Volume (vph)	5	253	55	54	178	153	61	1433	65	279	1711	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		1.00			0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3331			3213		1752	3505	1545	1752	3505	1547
Flt Permitted		0.95			0.75		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3156			2411		1752	3505	1545	1752	3505	1547
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	261	57	56	184	158	63	1477	67	288	1764	31
RTOR Reduction (vph)	0	21	0	0	131	0	0	0	34	0	0	12
Lane Group Flow (vph)	0	302	0	0	267	0	63	1477	33	288	1764	19
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1
Confl. Bikes (#/hr)			3						2			
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		14.2			14.2		5.8	44.3	44.3	18.0	56.5	56.5
Effective Green, g (s)		14.2			14.2		5.8	44.3	44.3	18.0	56.5	56.5
Actuated g/C Ratio		0.16			0.16		0.06	0.49	0.49	0.20	0.63	0.63
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		497			380		112	1725	760	350	2200	971
v/s Ratio Prot							0.04	c0.42		c0.16	0.50	
v/s Ratio Perm		0.10			c0.11				0.02			0.01
v/c Ratio		0.61			0.70		0.56	0.86	0.04	0.82	0.80	0.02
Uniform Delay, d1		35.3			35.9		40.9	20.1	11.9	34.5	12.6	6.3
Progression Factor		1.00			1.00		0.86	0.91	8.92	1.00	1.00	1.00
Incremental Delay, d2		2.1			5.8		5.1	4.7	0.1	14.4	3.2	0.0
Delay (s)		37.4			41.7		40.3	23.0	105.8	48.9	15.7	6.4
Level of Service		D			D		D	C	F	D	B	A
Approach Delay (s)		37.4			41.7			27.1			20.2	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			92.0%				ICU Level of Service			F		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis  
2: OR-224 & SE Monroe Street

04/12/2019

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	29	80	15	19	20	31	1526	13	21	1786	23
Future Volume (vph)	27	29	80	15	19	20	31	1526	13	21	1786	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1665			1770		1752	3505	1568	1752	3505	1521
Flt Permitted		0.94			0.83		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1574			1488		1752	3505	1568	1752	3505	1521
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	28	30	82	15	20	21	32	1573	13	22	1841	24
RTOR Reduction (vph)	0	63	0	0	19	0	0	0	4	0	0	7
Lane Group Flow (vph)	0	77	0	0	37	0	32	1573	9	22	1841	17
Confl. Peds. (#/hr)	1		3	3		1	4					4
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8					2			6
Actuated Green, G (s)		9.8			9.8		4.6	63.6	63.6	3.1	62.1	62.1
Effective Green, g (s)		9.8			9.8		4.6	63.6	63.6	3.1	62.1	62.1
Actuated g/C Ratio		0.11			0.11		0.05	0.71	0.71	0.03	0.69	0.69
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		171			162		89	2476	1108	60	2418	1049
v/s Ratio Prot							c0.02	0.45		0.01	c0.53	
v/s Ratio Perm		c0.05			0.03				0.01			0.01
v/c Ratio		0.45			0.23		0.36	0.64	0.01	0.37	0.76	0.02
Uniform Delay, d1		37.6			36.7		41.3	7.0	3.9	42.5	9.1	4.4
Progression Factor		1.00			1.00		0.98	0.63	1.00	1.35	0.27	1.00
Incremental Delay, d2		1.9			0.7		1.5	0.8	0.0	2.3	1.4	0.0
Delay (s)		39.4			37.4		42.2	5.2	3.9	59.5	3.9	4.4
Level of Service		D			D		D	A	A	E	A	A
Approach Delay (s)		39.4			37.4			5.9			4.5	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			7.0				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			67.1%				ICU Level of Service				C	
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: SE Oak Street & OR-224

04/12/2019

													
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR	
Lane Configurations													
Traffic Volume (vph)	25	198	77	122	229	131	214	1633	50	98	1417	163	
Future Volume (vph)	25	198	77	122	229	131	214	1633	50	98	1417	163	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1730	3471	1505	1733	3505	1555	1752	3505	1547	1770	3539	1531	
Flt Permitted	0.54	1.00	1.00	0.60	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	991	3471	1505	1089	3505	1555	1752	3505	1547	1770	3539	1531	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	27	213	83	131	246	141	230	1756	54	105	1524	175	
RTOR Reduction (vph)	0	0	70	0	0	12	0	0	22	0	0	60	
Lane Group Flow (vph)	27	213	13	131	246	129	230	1756	32	105	1524	115	
Confl. Peds. (#/hr)	3		10	10		3	5		1	1		5	
Confl. Bikes (#/hr)			3									1	
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	2%	2%	2%	
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases		4			8	5	5	2		1	6		
Permitted Phases	4		4	8		8			2			6	
Actuated Green, G (s)	14.6	14.6	14.6	14.6	14.6	29.3	14.7	53.6	53.6	8.3	47.2	47.2	
Effective Green, g (s)	14.6	14.6	14.6	14.6	14.6	29.3	14.7	53.6	53.6	8.3	47.2	47.2	
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.33	0.16	0.60	0.60	0.09	0.52	0.52	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	563	244	176	568	583	286	2087	921	163	1856	802	
v/s Ratio Prot		0.06			0.07	0.04	c0.13	c0.50		0.06	0.43		
v/s Ratio Perm	0.03		0.01	c0.12		0.05			0.02			0.07	
v/c Ratio	0.17	0.38	0.06	0.74	0.43	0.22	0.80	0.84	0.03	0.64	0.82	0.14	
Uniform Delay, d1	32.5	33.6	31.9	35.9	34.0	22.1	36.3	14.8	7.5	39.4	17.9	11.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.08	0.69	2.22	0.71	1.29	2.60	
Incremental Delay, d2	0.5	0.4	0.1	15.6	0.5	0.2	11.2	3.2	0.1	6.7	3.3	0.3	
Delay (s)	33.0	34.1	32.0	51.5	34.5	22.2	50.3	13.3	16.7	34.8	26.3	28.9	
Level of Service	C	C	C	D	C	C	D	B	B	C	C	C	
Approach Delay (s)		33.4			35.5			17.6			27.1		
Approach LOS		C			D			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			24.3									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.84										
Actuated Cycle Length (s)			90.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			81.0%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
4: OR-224 & SE Edison Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕↕	↕	↕↕		↕	↕↕	↕
Traffic Volume (vph)	17	82	13	101	63	188	29	1445	0	68	1753	18
Future Volume (vph)	17	82	13	101	63	188	29	1445	0	68	1753	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00	0.88	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		0.98			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1835			1824	2752	1770	3539		1736	3471	1553
Flt Permitted		0.94			0.70	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1733			1307	2752	1770	3539		1736	3471	1553
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	18	87	14	107	67	200	31	1537	0	72	1865	19
RTOR Reduction (vph)	0	6	0	0	0	166	0	0	0	0	0	7
Lane Group Flow (vph)	0	113	0	0	174	34	31	1537	0	72	1865	12
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)		15.5			15.5	15.5	3.2	55.3		5.7	57.8	57.8
Effective Green, g (s)		15.5			15.5	15.5	3.2	55.3		5.7	57.8	57.8
Actuated g/C Ratio		0.17			0.17	0.17	0.04	0.61		0.06	0.64	0.64
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		298			225	473	62	2174		109	2229	997
v/s Ratio Prot							0.02	0.43		c0.04	c0.54	
v/s Ratio Perm		0.07			c0.13	0.01						0.01
v/c Ratio		0.38			0.77	0.07	0.50	0.71		0.66	0.84	0.01
Uniform Delay, d1		33.0			35.6	31.2	42.6	11.8		41.2	12.5	5.8
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.85	0.91	1.00
Incremental Delay, d2		0.8			15.2	0.1	6.2	2.0		8.3	2.3	0.0
Delay (s)		33.8			50.7	31.3	48.8	13.8		43.4	13.7	5.8
Level of Service		C			D	C	D	B		D	B	A
Approach Delay (s)		33.8			40.3			14.5			14.7	
Approach LOS		C			D			B			B	

Intersection Summary		
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.83	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	79.4%	13.5
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

# HCM Unsignalized Intersection Capacity Analysis

## 5: SE 37th Avenue & SE Edison Street/SE International Way

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↘			↕	↗
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	125	31	0	0	165	212	0	124	13	47	0	175
Future Volume (vph)	125	31	0	0	165	212	0	124	13	47	0	175
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	137	34	0	0	181	233	0	136	14	52	0	192

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total (vph)	171	91	91	233	150	116	128
Volume Left (vph)	137	0	0	0	0	52	0
Volume Right (vph)	0	0	0	233	14	64	128
Hadj (s)	0.21	0.05	0.05	-0.65	-0.02	-0.24	-0.60
Departure Headway (s)	5.1	5.4	5.4	3.2	4.9	4.8	3.2
Degree Utilization, x	0.24	0.14	0.14	0.21	0.21	0.15	0.11
Capacity (veh/h)	662	625	627	1122	680	692	1121
Control Delay (s)	9.8	8.1	8.1	5.8	9.2	8.6	6.6
Approach Delay (s)	9.8	6.8			9.2	7.6	
Approach LOS	A	A			A	A	

### Intersection Summary

Delay	7.9
Level of Service	A
Intersection Capacity Utilization	40.2%
ICU Level of Service	A
Analysis Period (min)	15

# HCM Signalized Intersection Capacity Analysis

## 6: SE 32nd Avenue & SE Harrison Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	417	3	29	240	17	31	126	30	49	144	121
Future Volume (vph)	124	417	3	29	240	17	31	126	30	49	144	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1736	1825		1736	1804			1863	1512		1810	1568
Flt Permitted	0.95	1.00		0.95	1.00			0.90	1.00		0.87	1.00
Satd. Flow (perm)	1736	1825		1736	1804			1697	1512		1601	1568
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	138	463	3	32	267	19	34	140	33	54	160	134
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	26	0	0	105
Lane Group Flow (vph)	138	466	0	32	283	0	0	174	7	0	214	29
Confl. Peds. (#/hr)	11						11		20	20		
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	1%	1%	1%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.5	30.8		2.5	25.8			13.2	13.2		13.2	13.2
Effective Green, g (s)	7.5	30.8		2.5	25.8			13.2	13.2		13.2	13.2
Actuated g/C Ratio	0.12	0.51		0.04	0.43			0.22	0.22		0.22	0.22
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	217	936		72	775			373	332		352	344
v/s Ratio Prot	c0.08	c0.26		0.02	0.16							
v/s Ratio Perm								0.10	0.00		c0.13	0.02
v/c Ratio	0.64	0.50		0.44	0.36			0.47	0.02		0.61	0.09
Uniform Delay, d1	25.0	9.5		28.1	11.6			20.3	18.3		21.1	18.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.0	1.9		4.3	1.3			0.9	0.0		3.0	0.1
Delay (s)	30.9	11.4		32.4	12.9			21.3	18.4		24.0	18.7
Level of Service	C	B		C	B			C	B		C	B
Approach Delay (s)		15.9			14.8			20.8			22.0	
Approach LOS		B			B			C			C	

### Intersection Summary

HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



7: SE Oak Street & SE Monroe Street Performance by approach


















Approach	NB	SE	NW	All
Denied Delay (hr)	0.2	0.0	0.0	0.2
Denied Del/Veh (s)	1.4	0.5	0.3	0.9
Total Delay (hr)	0.2	1.0	0.7	1.8
Total Del/Veh (s)	1.2	13.3	9.9	6.6
Stop Delay (hr)	0.0	0.9	0.6	1.5
Stop Del/Veh (s)	0.0	12.7	7.7	5.4
Total Stops	11	235	259	505
Stop/Veh	0.02	0.91	1.00	0.51
Vehicles Entered	470	257	259	986
Vehicles Exited	468	258	259	985
Hourly Exit Rate	468	258	259	985
Input Volume	463	264	258	985
% of Volume	101	98	100	100
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Total Network Performance

Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.9
Total Delay (hr)	2.0
Total Del/Veh (s)	7.3
Stop Delay (hr)	1.6
Stop Del/Veh (s)	5.7
Total Stops	505
Stop/Veh	0.51
Vehicles Entered	986
Vehicles Exited	986
Hourly Exit Rate	986
Input Volume	1970
% of Volume	50
Denied Entry Before	0
Denied Entry After	0

HCM Unsignalized Intersection Capacity Analysis  
 8: SE 37th Avenue & SE Monroe Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	271	148	58	140	6	89	85	190	5	64	8
Future Volume (vph)	14	271	148	58	140	6	89	85	190	5	64	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	301	164	64	156	7	99	94	211	6	71	9
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	481	227	99	305	86							
Volume Left (vph)	16	64	99	0	6							
Volume Right (vph)	164	7	0	211	9							
Hadj (s)	-0.16	0.07	0.52	-0.47	0.00							
Departure Headway (s)	5.7	6.4	7.3	6.3	7.1							
Degree Utilization, x	0.76	0.40	0.20	0.54	0.17							
Capacity (veh/h)	614	511	465	530	441							
Control Delay (s)	24.4	13.6	11.0	15.2	11.5							
Approach Delay (s)	24.4	13.6	14.1		11.5							
Approach LOS	C	B	B		B							
Intersection Summary												
Delay			18.0									
Level of Service			C									
Intersection Capacity Utilization			60.1%	ICU Level of Service	B							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 9: SE 37th Avenue & SE Washington Street

04/12/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	1	340	8	2	241
Future Volume (Veh/h)	3	1	340	8	2	241
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	1	374	9	2	265
Pedestrians	1		6			1
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	0		1			0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	654	380			384	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	654	380			384	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	431	670			1173	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	4	383	267			
Volume Left	3	0	2			
Volume Right	1	9	0			
cSH	473	1700	1173			
Volume to Capacity	0.01	0.23	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	12.7	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	12.7	0.0	0.1			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization		28.7%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: SE 37th Avenue & SE Railroad Avenue

04/12/2019























Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	99	93	284	174	154	121
Future Volume (Veh/h)	99	93	284	174	154	121
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	113	106	323	198	175	138
Pedestrians						2
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)	1					
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	910	424			521	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	910	424			521	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	56	83			83	
cM capacity (veh/h)	255	631			1045	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	219	521	313			
Volume Left	113	0	175			
Volume Right	106	198	0			
cSH	426	1700	1045			
Volume to Capacity	0.51	0.31	0.17			
Queue Length 95th (ft)	71	0	15			
Control Delay (s)	22.0	0.0	5.8			
Lane LOS	C		A			
Approach Delay (s)	22.0	0.0	5.8			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			6.3			
Intersection Capacity Utilization			56.4%		ICU Level of Service	B
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 1: OR-224 & SE Harrison Street

















04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	125	41	40	186	308	59	1800	57	93	887	14
Future Volume (vph)	19	125	41	40	186	308	59	1800	57	93	887	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		1.00			0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3019			3132		1719	3438	1538	1703	3406	1524
Flt Permitted		0.77			0.91		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2322			2863		1719	3438	1538	1703	3406	1524
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	20	134	44	43	200	331	63	1935	61	100	954	15
RTOR Reduction (vph)	0	30	0	0	108	0	0	0	25	0	0	6
Lane Group Flow (vph)	0	168	0	0	466	0	63	1935	36	100	954	9
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		17.2			17.2		6.8	52.7	52.7	6.6	52.5	52.5
Effective Green, g (s)		17.2			17.2		6.8	52.7	52.7	6.6	52.5	52.5
Actuated g/C Ratio		0.19			0.19		0.08	0.59	0.59	0.07	0.58	0.58
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		443			547		129	2013	900	124	1986	889
v/s Ratio Prot							0.04	c0.56		c0.06	0.28	
v/s Ratio Perm		0.07			c0.16				0.02			0.01
v/c Ratio		0.38			0.85		0.49	0.96	0.04	0.81	0.48	0.01
Uniform Delay, d1		31.7			35.2		39.9	17.7	7.9	41.1	10.9	7.9
Progression Factor		1.00			1.00		1.12	0.54	0.64	1.00	1.00	1.00
Incremental Delay, d2		0.5			12.2		2.1	10.0	0.1	30.5	0.8	0.0
Delay (s)		32.3			47.4		46.9	19.6	5.1	71.5	11.7	7.9
Level of Service		C			D		D	B	A	E	B	A
Approach Delay (s)		32.3			47.4			20.0			17.2	
Approach LOS		C			D			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			23.9				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			91.6%				ICU Level of Service				F	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
2: OR-224 & SE Monroe Street

04/12/2019

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	10	59	5	18	24	41	1865	14	5	949	16
Future Volume (vph)	32	10	59	5	18	24	41	1865	14	5	949	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1688			1709		1719	3438	1504	1687	3374	1509
Flt Permitted		0.91			0.96		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1568			1643		1719	3438	1504	1687	3374	1509
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	34	11	63	5	19	26	44	1984	15	5	1010	17
RTOR Reduction (vph)	0	58	0	0	24	0	0	0	4	0	0	5
Lane Group Flow (vph)	0	50	0	0	26	0	44	1984	11	5	1010	12
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		7.5			7.5		5.4	67.7	67.7	1.3	63.6	63.6
Effective Green, g (s)		7.5			7.5		5.4	67.7	67.7	1.3	63.6	63.6
Actuated g/C Ratio		0.08			0.08		0.06	0.75	0.75	0.01	0.71	0.71
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		130			136		103	2586	1131	24	2384	1066
v/s Ratio Prot							c0.03	c0.58		0.00	0.30	
v/s Ratio Perm		c0.03			0.02				0.01			0.01
v/c Ratio		0.39			0.19		0.43	0.77	0.01	0.21	0.42	0.01
Uniform Delay, d1		39.1			38.4		40.8	6.5	2.8	43.8	5.5	3.9
Progression Factor		1.00			1.00		1.07	0.55	1.00	1.14	0.38	1.00
Incremental Delay, d2		1.9			0.7		1.9	1.5	0.0	3.8	0.5	0.0
Delay (s)		41.0			39.1		45.4	5.1	2.8	53.9	2.6	3.9
Level of Service		D			D		D	A	A	D	A	A
Approach Delay (s)		41.0			39.1			6.0			2.9	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			6.7				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			72.0%				ICU Level of Service				C	
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis





















## 3: SE Oak Street & OR-224

04/12/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	49	169	87	80	275	193	88	915	17	138	1641	168
Future Volume (vph)	49	169	87	80	275	193	88	915	17	138	1641	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	3438	1511	1711	3438	1519	1719	3438	1538	1703	3406	1489
Flt Permitted	0.48	1.00	1.00	0.64	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	856	3438	1511	1158	3438	1519	1719	3438	1538	1703	3406	1489
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	50	172	89	82	281	197	90	934	17	141	1674	171
RTOR Reduction (vph)	0	0	76	0	0	55	0	0	7	0	0	49
Lane Group Flow (vph)	50	172	13	82	281	142	90	934	10	141	1674	122
Confl. Peds. (#/hr)	5		4	4		5	1					1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%	6%
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	13.2	13.2	13.2	13.2	13.2	21.9	8.7	51.1	51.1	12.2	54.6	54.6
Effective Green, g (s)	13.2	13.2	13.2	13.2	13.2	21.9	8.7	51.1	51.1	12.2	54.6	54.6
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.24	0.10	0.57	0.57	0.14	0.61	0.61
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	125	504	221	169	504	445	166	1952	873	230	2066	903
v/s Ratio Prot		0.05			c0.08	0.03	0.05	0.27		c0.08	c0.49	
v/s Ratio Perm	0.06		0.01	0.07		0.06			0.01			0.08
v/c Ratio	0.40	0.34	0.06	0.49	0.56	0.32	0.54	0.48	0.01	0.61	0.81	0.13
Uniform Delay, d1	34.8	34.5	33.1	35.3	35.7	27.9	38.8	11.5	8.5	36.7	13.7	7.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.66	1.00	0.60	1.76	3.14
Incremental Delay, d2	2.1	0.4	0.1	2.2	1.3	0.4	3.4	0.8	0.0	2.3	1.7	0.1
Delay (s)	36.9	34.9	33.2	37.5	37.0	28.3	38.5	8.4	8.5	24.3	25.8	24.0
Level of Service	D	C	C	D	D	C	D	A	A	C	C	C
Approach Delay (s)		34.7			34.0			11.0			25.6	
Approach LOS		C			C			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			23.6			HCM 2000 Level of Service		C				
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)		13.5				
Intersection Capacity Utilization			78.1%			ICU Level of Service		D				
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
4: OR-224 & SE Edison Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	53	24	63	31	129	7	1802	0	112	938	19
Future Volume (vph)	17	53	24	63	31	129	7	1802	0	112	938	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00	0.88	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		0.97			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1758			1735	2621	1719	3438		1687	3374	1509
Flt Permitted		0.93			0.71	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1652			1268	2621	1719	3438		1687	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	56	25	66	33	136	7	1897	0	118	987	20
RTOR Reduction (vph)	0	15	0	0	0	118	0	0	0	0	0	6
Lane Group Flow (vph)	0	84	0	0	99	18	7	1897	0	118	987	14
Confl. Peds. (#/hr)	1					1						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	5%	5%	5%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)		11.7			11.7	11.7	1.3	54.1		10.7	63.5	63.5
Effective Green, g (s)		11.7			11.7	11.7	1.3	54.1		10.7	63.5	63.5
Actuated g/C Ratio		0.13			0.13	0.13	0.01	0.60		0.12	0.71	0.71
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		214			164	340	24	2066		200	2380	1064
v/s Ratio Prot							0.00	c0.55		c0.07	0.29	
v/s Ratio Perm		0.05			c0.08	0.01						0.01
v/c Ratio		0.39			0.60	0.05	0.29	0.92		0.59	0.41	0.01
Uniform Delay, d1		35.9			37.0	34.3	43.9	16.0		37.6	5.5	3.9
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.81	1.97	1.00
Incremental Delay, d2		1.2			6.1	0.1	6.7	8.0		4.0	0.5	0.0
Delay (s)		37.1			43.1	34.4	50.5	24.0		34.3	11.4	4.0
Level of Service		D			D	C	D	C		C	B	A
Approach Delay (s)		37.1			38.0			24.1			13.7	
Approach LOS		D			D			C			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			22.0									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			90.0								13.5	Sum of lost time (s)
Intersection Capacity Utilization			79.2%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												



HCM Unsignalized Intersection Capacity Analysis  
 5: SE 37th Avenue & SE Edison Street/SE International Way

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↘			↕	↗
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	45	120	0	0	44	46	0	91	42	121	0	175
Future Volume (vph)	45	120	0	0	44	46	0	91	42	121	0	175
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	54	143	0	0	52	55	0	108	50	144	0	208

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total (vph)	197	26	26	55	158	213	139
Volume Left (vph)	54	0	0	0	0	144	0
Volume Right (vph)	0	0	0	55	50	69	139
Hadj (s)	0.12	0.24	0.24	-0.46	-0.16	-0.04	-0.58
Departure Headway (s)	5.1	5.9	5.9	3.2	4.7	4.7	3.2
Degree Utilization, x	0.28	0.04	0.04	0.05	0.21	0.28	0.12
Capacity (veh/h)	661	557	559	1121	720	717	1121
Control Delay (s)	10.1	7.9	7.9	5.2	8.9	9.6	6.6
Approach Delay (s)	10.1	6.5			8.9	8.4	
Approach LOS	B	A			A	A	

Intersection Summary

Delay	8.7
Level of Service	A
Intersection Capacity Utilization	43.1%
ICU Level of Service	A
Analysis Period (min)	15

# HCM Signalized Intersection Capacity Analysis

## 6: SE 32nd Avenue & SE Harrison Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	108	123	6	21	387	19	36	140	16	16	115	119	
Future Volume (vph)	108	123	6	21	387	19	36	140	16	16	115	119	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00	
Satd. Flow (prot)	1656	1732		1752	1830			1826	1524		1764	1474	
Flt Permitted	0.95	1.00		0.95	1.00			0.91	1.00		0.95	1.00	
Satd. Flow (perm)	1656	1732		1752	1830			1672	1524		1680	1474	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	116	132	6	23	416	20	39	151	17	17	124	128	
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	14	0	0	103	
Lane Group Flow (vph)	116	136	0	23	434	0	0	190	3	0	141	25	
Confl. Peds. (#/hr)	4					4			5	5			
Confl. Bikes (#/hr)												2	
Heavy Vehicles (%)	9%	9%	9%	3%	3%	3%	3%	3%	3%	7%	7%	7%	
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	5	2		1	6			4			8		
Permitted Phases							4		4	8		8	
Actuated Green, G (s)	7.6	33.3		1.3	27.0			11.9	11.9		11.9	11.9	
Effective Green, g (s)	7.6	33.3		1.3	27.0			11.9	11.9		11.9	11.9	
Actuated g/C Ratio	0.13	0.55		0.02	0.45			0.20	0.20		0.20	0.20	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	209	961		37	823			331	302		333	292	
v/s Ratio Prot	c0.07	0.08		0.01	c0.24								
v/s Ratio Perm								c0.11	0.00		0.08	0.02	
v/c Ratio	0.56	0.14		0.62	0.53			0.57	0.01		0.42	0.09	
Uniform Delay, d1	24.6	6.4		29.1	11.9			21.8	19.3		21.0	19.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	0.3		28.2	2.4			2.4	0.0		0.9	0.1	
Delay (s)	27.8	6.8		57.3	14.3			24.2	19.3		21.9	19.7	
Level of Service	C	A		E	B			C	B		C	B	
Approach Delay (s)		16.4			16.5			23.8			20.9		
Approach LOS		B			B			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			18.7									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			60.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			58.3%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

7: SE Oak Street & SE Monroe Street Performance by approach


















Approach	NB	SE	NW	All
Denied Delay (hr)	0.1	0.0	0.0	0.2
Denied Del/Veh (s)	2.2	0.2	0.4	0.9
Total Delay (hr)	0.0	0.3	1.2	1.5
Total Del/Veh (s)	0.5	6.5	10.5	6.8
Stop Delay (hr)	0.0	0.3	0.9	1.2
Stop Del/Veh (s)	0.0	5.6	8.1	5.2
Total Stops	2	169	406	577
Stop/Veh	0.01	0.99	0.99	0.71
Vehicles Entered	232	170	407	809
Vehicles Exited	233	170	409	812
Hourly Exit Rate	233	170	409	812
Input Volume	234	172	415	821
% of Volume	100	99	99	99
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Total Network Performance

Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.9
Total Delay (hr)	1.7
Total Del/Veh (s)	7.6
Stop Delay (hr)	1.3
Stop Del/Veh (s)	5.6
Total Stops	577
Stop/Veh	0.71
Vehicles Entered	809
Vehicles Exited	809
Hourly Exit Rate	809
Input Volume	1642
% of Volume	49
Denied Entry Before	0
Denied Entry After	0

HCM Unsignalized Intersection Capacity Analysis  
 8: SE 37th Avenue & SE Monroe Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	98	75	58	226	1	152	38	45	1	60	30
Future Volume (vph)	4	98	75	58	226	1	152	38	45	1	60	30
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	110	84	65	254	1	171	43	51	1	67	34
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	198	320	171	94	102							
Volume Left (vph)	4	65	171	0	1							
Volume Right (vph)	84	1	0	51	34							
Hadj (s)	-0.17	0.09	0.57	-0.31	-0.11							
Departure Headway (s)	5.3	5.4	6.7	5.8	5.8							
Degree Utilization, x	0.29	0.48	0.32	0.15	0.17							
Capacity (veh/h)	621	635	498	579	545							
Control Delay (s)	10.5	13.2	11.5	8.6	10.0							
Approach Delay (s)	10.5	13.2	10.5		10.0							
Approach LOS	B	B	B		A							
Intersection Summary												
Delay			11.4									
Level of Service			B									
Intersection Capacity Utilization			50.7%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 9: SE 37th Avenue & SE Washington Street

04/12/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	3	206	3	1	196
Future Volume (Veh/h)	10	3	206	3	1	196
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	11	3	234	3	1	223
Pedestrians	1		1			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	3.5		3.5			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	462	236			238	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	462	236			238	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	560	807			1340	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	14	237	224			
Volume Left	11	0	1			
Volume Right	3	3	0			
cSH	599	1700	1340			
Volume to Capacity	0.02	0.14	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	11.2	0.0	0.0			
Lane LOS	B		A			
Approach Delay (s)	11.2	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			21.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: SE 37th Avenue & SE Railroad Avenue

04/12/2019























Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	156	144	84	31	60	148
Future Volume (Veh/h)	156	144	84	31	60	148
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	171	158	92	34	66	163
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)	1					
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	404	110			126	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	404	110			126	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	83			95	
cM capacity (veh/h)	575	943			1454	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	329	126	229			
Volume Left	171	0	66			
Volume Right	158	34	0			
cSH	907	1700	1454			
Volume to Capacity	0.36	0.07	0.05			
Queue Length 95th (ft)	42	0	4			
Control Delay (s)	11.2	0.0	2.5			
Lane LOS	B		A			
Approach Delay (s)	11.2	0.0	2.5			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			6.2			
Intersection Capacity Utilization			33.2%	ICU Level of Service		A
Analysis Period (min)	15					

# HCM Signalized Intersection Capacity Analysis

## 1: OR-224 & SE Harrison Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	268	58	57	189	162	65	1470	69	296	1755	32
Future Volume (vph)	5	268	58	57	189	162	65	1470	69	296	1755	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		1.00			0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3332			3214		1752	3505	1545	1752	3505	1547
Flt Permitted		0.95			0.73		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3158			2374		1752	3505	1545	1752	3505	1547
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	276	60	59	195	167	67	1515	71	305	1809	33
RTOR Reduction (vph)	0	21	0	0	127	0	0	0	37	0	0	12
Lane Group Flow (vph)	0	320	0	0	294	0	67	1515	34	305	1809	21
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1
Confl. Bikes (#/hr)			3						2			
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		14.8			14.8		5.2	43.4	43.4	18.3	56.5	56.5
Effective Green, g (s)		14.8			14.8		5.2	43.4	43.4	18.3	56.5	56.5
Actuated g/C Ratio		0.16			0.16		0.06	0.48	0.48	0.20	0.63	0.63
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		519			390		101	1690	745	356	2200	971
v/s Ratio Prot							0.04	c0.43		c0.17	0.52	
v/s Ratio Perm		0.10			c0.12				0.02			0.01
v/c Ratio		0.62			0.75		0.66	0.90	0.05	0.86	0.82	0.02
Uniform Delay, d1		35.0			35.9		41.5	21.3	12.3	34.6	12.9	6.3
Progression Factor		1.00			1.00		0.85	0.85	4.93	1.00	1.00	1.00
Incremental Delay, d2		2.2			8.0		12.2	6.4	0.1	18.0	3.6	0.0
Delay (s)		37.1			43.9		47.6	24.5	60.9	52.6	16.5	6.4
Level of Service		D			D		D	C	E	D	B	A
Approach Delay (s)		37.1			43.9			27.0			21.5	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			26.7				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			95.0%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: OR-224 & SE Monroe Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↕↕	↗	↗	↗	↕↕
Traffic Volume (vph)	29	31	85	16	20	21	33	1565	14	22	1832	24
Future Volume (vph)	29	31	85	16	20	21	33	1565	14	22	1832	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1665			1770		1752	3505	1568	1752	3505	1521
Flt Permitted		0.94			0.82		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1574			1469		1752	3505	1568	1752	3505	1521
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	30	32	88	16	21	22	34	1613	14	23	1889	25
RTOR Reduction (vph)	0	63	0	0	19	0	0	0	4	0	0	8
Lane Group Flow (vph)	0	87	0	0	40	0	34	1613	10	23	1889	17
Confl. Peds. (#/hr)	1		3	3		1	4					4
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8					2			6
Actuated Green, G (s)		10.3			10.3		4.5	63.2	63.2	3.0	61.7	61.7
Effective Green, g (s)		10.3			10.3		4.5	63.2	63.2	3.0	61.7	61.7
Actuated g/C Ratio		0.11			0.11		0.05	0.70	0.70	0.03	0.69	0.69
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		180			168		87	2461	1101	58	2402	1042
v/s Ratio Prot							c0.02	0.46		0.01	c0.54	
v/s Ratio Perm		c0.06			0.03				0.01			0.01
v/c Ratio		0.48			0.24		0.39	0.66	0.01	0.40	0.79	0.02
Uniform Delay, d1		37.4			36.3		41.4	7.4	4.0	42.6	9.7	4.5
Progression Factor		1.00			1.00		0.99	0.59	1.00	1.36	0.30	1.00
Incremental Delay, d2		2.0			0.7		1.7	0.8	0.0	2.6	1.6	0.0
Delay (s)		39.4			37.0		42.7	5.1	4.0	60.6	4.5	4.5
Level of Service		D			D		D	A	A	E	A	A
Approach Delay (s)		39.4			37.0			5.9			5.1	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			7.3				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			69.0%				ICU Level of Service				C	
Analysis Period (min)			15									

























c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 3: SE Oak Street & OR-224

04/12/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	27	210	82	129	243	139	227	1675	53	104	1454	173
Future Volume (vph)	27	210	82	129	243	139	227	1675	53	104	1454	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1730	3471	1505	1734	3505	1555	1752	3505	1547	1770	3539	1531
Flt Permitted	0.53	1.00	1.00	0.58	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	958	3471	1505	1057	3505	1555	1752	3505	1547	1770	3539	1531
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	29	226	88	139	261	149	244	1801	57	112	1563	186
RTOR Reduction (vph)	0	0	73	0	0	12	0	0	23	0	0	62
Lane Group Flow (vph)	29	226	15	139	261	137	244	1801	34	112	1563	124
Confl. Peds. (#/hr)	3		10	10		3	5		1	1		5
Confl. Bikes (#/hr)			3									1
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5		2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	15.3	15.3	15.3	15.3	15.3	30.1	14.8	53.0	53.0	8.2	46.4	46.4
Effective Green, g (s)	15.3	15.3	15.3	15.3	15.3	30.1	14.8	53.0	53.0	8.2	46.4	46.4
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17	0.33	0.16	0.59	0.59	0.09	0.52	0.52
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	590	255	179	595	597	288	2064	911	161	1824	789
v/s Ratio Prot		0.07			0.07	0.04	c0.14	c0.51		0.06	0.44	
v/s Ratio Perm	0.03		0.01	c0.13		0.05			0.02			0.08
v/c Ratio	0.18	0.38	0.06	0.78	0.44	0.23	0.85	0.87	0.04	0.70	0.86	0.16
Uniform Delay, d1	32.0	33.2	31.3	35.7	33.5	21.6	36.5	15.6	7.8	39.7	18.9	11.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.06	0.71	2.17	0.71	1.33	2.56
Incremental Delay, d2	0.5	0.4	0.1	18.8	0.5	0.2	14.8	3.9	0.1	9.5	4.2	0.3
Delay (s)	32.5	33.6	31.4	54.5	34.0	21.8	53.6	14.9	16.9	37.6	29.3	29.8
Level of Service	C	C	C	D	C	C	D	B	B	D	C	C
Approach Delay (s)		32.9			35.9			19.5			29.9	
Approach LOS		C			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			26.3									C
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			90.0						13.5			
Intersection Capacity Utilization			83.3%									E
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 4: OR-224 & SE Edison Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕↕	↕	↕↕		↕	↕↕	↕
Traffic Volume (vph)	18	87	14	107	67	200	31	1482	0	72	1798	19
Future Volume (vph)	18	87	14	107	67	200	31	1482	0	72	1798	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00	0.88	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		0.98			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1835			1824	2752	1770	3539		1736	3471	1553
Flt Permitted		0.94			0.68	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1731			1279	2752	1770	3539		1736	3471	1553
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	19	93	15	114	71	213	33	1577	0	77	1913	20
RTOR Reduction (vph)	0	6	0	0	0	173	0	0	0	0	0	7
Lane Group Flow (vph)	0	121	0	0	185	40	33	1577	0	77	1913	13
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)		16.1			16.1	16.1	3.0	54.7		5.7	57.4	57.4
Effective Green, g (s)		16.1			16.1	16.1	3.0	54.7		5.7	57.4	57.4
Actuated g/C Ratio		0.18			0.18	0.18	0.03	0.61		0.06	0.64	0.64
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		309			228	492	59	2150		109	2213	990
v/s Ratio Prot							0.02	0.45		c0.04	c0.55	
v/s Ratio Perm		0.07			c0.14	0.01						0.01
v/c Ratio		0.39			0.81	0.08	0.56	0.73		0.71	0.86	0.01
Uniform Delay, d1		32.6			35.5	30.8	42.8	12.5		41.3	13.2	6.0
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.87	0.89	1.00
Incremental Delay, d2		0.8			19.3	0.1	11.0	2.3		10.5	2.6	0.0
Delay (s)		33.5			54.8	30.9	53.9	14.8		46.4	14.4	6.0
Level of Service		C			D	C	D	B		D	B	A
Approach Delay (s)		33.5			42.0			15.6			15.5	
Approach LOS		C			D			B			B	

Intersection Summary		
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.86	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	81.2%	13.5
Analysis Period (min)	15	ICU Level of Service
		D
c	Critical Lane Group	

HCM Unsignalized Intersection Capacity Analysis  
 5: SE 37th Avenue & SE Edison Street/SE International Way

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↘			↕	↗
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	133	33	0	0	175	225	0	132	14	50	0	186
Future Volume (vph)	133	33	0	0	175	225	0	132	14	50	0	186
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	146	36	0	0	192	247	0	145	15	55	0	204

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total (vph)	182	96	96	247	160	123	136
Volume Left (vph)	146	0	0	0	0	55	0
Volume Right (vph)	0	0	0	247	15	68	136
Hadj (s)	0.21	0.05	0.05	-0.65	-0.02	-0.24	-0.60
Departure Headway (s)	5.2	5.5	5.5	3.2	5.0	4.9	3.2
Degree Utilization, x	0.26	0.15	0.15	0.22	0.22	0.17	0.12
Capacity (veh/h)	652	616	618	1122	666	676	1121
Control Delay (s)	10.1	8.2	8.2	5.9	9.4	8.8	6.6
Approach Delay (s)	10.1	6.9			9.4	7.7	
Approach LOS	B	A			A	A	

Intersection Summary

Delay	8.0
Level of Service	A
Intersection Capacity Utilization	41.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis  
6: SE 32nd Avenue & SE Harrison Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↖	↗
Traffic Volume (vph)	132	443	3	31	255	18	33	134	32	52	153	128
Future Volume (vph)	132	443	3	31	255	18	33	134	32	52	153	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1736	1825		1736	1804			1863	1512		1810	1568
Flt Permitted	0.95	1.00		0.95	1.00			0.90	1.00		0.87	1.00
Satd. Flow (perm)	1736	1825		1736	1804			1686	1512		1591	1568
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	147	492	3	34	283	20	37	149	36	58	170	142
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	28	0	0	110
Lane Group Flow (vph)	147	495	0	34	300	0	0	186	8	0	228	32
Confl. Peds. (#/hr)	11					11			20	20		
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	1%	1%	1%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.5	30.6		2.3	25.4			13.6	13.6		13.6	13.6
Effective Green, g (s)	7.5	30.6		2.3	25.4			13.6	13.6		13.6	13.6
Actuated g/C Ratio	0.12	0.51		0.04	0.42			0.23	0.23		0.23	0.23
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	217	930		66	763			382	342		360	355
v/s Ratio Prot	c0.08	c0.27		0.02	0.17							
v/s Ratio Perm								0.11	0.01		c0.14	0.02
v/c Ratio	0.68	0.53		0.52	0.39			0.49	0.02		0.63	0.09
Uniform Delay, d1	25.1	9.9		28.3	12.0			20.2	18.0		20.9	18.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	8.1	2.2		6.6	1.5			1.0	0.0		3.6	0.1
Delay (s)	33.2	12.1		34.9	13.5			21.1	18.1		24.6	18.4
Level of Service	C	B		C	B			C	B		C	B
Approach Delay (s)		16.9			15.6			20.6			22.2	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

7: SE Oak Street & SE Monroe Street Performance by approach


















Approach	NB	SE	NW	All
Denied Delay (hr)	0.2	0.2	0.0	0.4
Denied Del/Veh (s)	1.4	2.1	0.3	1.3
Total Delay (hr)	0.2	1.4	1.0	2.5
Total Del/Veh (s)	1.2	17.6	12.4	8.6
Stop Delay (hr)	0.0	1.4	0.8	2.2
Stop Del/Veh (s)	0.1	17.7	10.2	7.5
Total Stops	12	230	278	520
Stop/Veh	0.02	0.80	1.00	0.49
Vehicles Entered	494	287	278	1059
Vehicles Exited	494	287	278	1059
Hourly Exit Rate	494	287	278	1059
Input Volume	491	280	274	1045
% of Volume	101	102	101	101
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Total Network Performance

Denied Delay (hr)	0.4
Denied Del/Veh (s)	1.3
Total Delay (hr)	2.8
Total Del/Veh (s)	9.3
Stop Delay (hr)	2.3
Stop Del/Veh (s)	7.8
Total Stops	520
Stop/Veh	0.49
Vehicles Entered	1059
Vehicles Exited	1059
Hourly Exit Rate	1059
Input Volume	2090
% of Volume	51
Denied Entry Before	0
Denied Entry After	0

HCM Unsignalized Intersection Capacity Analysis  
 8: SE 37th Avenue & SE Monroe Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	288	157	62	149	6	94	90	202	5	68	8
Future Volume (vph)	15	288	157	62	149	6	94	90	202	5	68	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	320	174	69	166	7	104	100	224	6	76	9
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	511	242	104	324	91							
Volume Left (vph)	17	69	104	0	6							
Volume Right (vph)	174	7	0	224	9							
Hadj (s)	-0.16	0.07	0.52	-0.47	0.00							
Departure Headway (s)	5.9	6.6	7.6	6.5	7.4							
Degree Utilization, x	0.83	0.45	0.22	0.59	0.19							
Capacity (veh/h)	598	494	452	515	433							
Control Delay (s)	31.5	14.9	11.4	17.3	12.1							
Approach Delay (s)	31.5	14.9	15.9		12.1							
Approach LOS	D	B	C		B							
Intersection Summary												
Delay			21.7									
Level of Service			C									
Intersection Capacity Utilization			63.5%		ICU Level of Service		B					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 9: SE 37th Avenue & SE Washington Street

04/12/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	1	361	8	2	256
Future Volume (Veh/h)	3	1	361	8	2	256
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	1	397	9	2	281
Pedestrians	1		6			1
Lane Width (ft)	12.0		12.0		12.0	
Walking Speed (ft/s)	3.5		3.5		3.5	
Percent Blockage	0		1		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	694	404			407	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	694	404			407	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	409	650			1151	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	4	406	283			
Volume Left	3	0	2			
Volume Right	1	9	0			
cSH	450	1700	1151			
Volume to Capacity	0.01	0.24	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	13.1	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	0.1			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			29.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: SE 37th Avenue & SE Railroad Avenue

04/12/2019























Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	105	99	301	185	163	128
Future Volume (Veh/h)	105	99	301	185	163	128
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	119	113	342	210	185	145
Pedestrians						2
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)	1					
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	962	449			552	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	962	449			552	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	49	82			82	
cM capacity (veh/h)	233	611			1018	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	232	552	330			
Volume Left	119	0	185			
Volume Right	113	210	0			
cSH	394	1700	1018			
Volume to Capacity	0.59	0.32	0.18			
Queue Length 95th (ft)	91	0	17			
Control Delay (s)	26.4	0.0	6.0			
Lane LOS	D		A			
Approach Delay (s)	26.4	0.0	6.0			
Approach LOS	D					
<b>Intersection Summary</b>						
Average Delay			7.3			
Intersection Capacity Utilization			59.2%	ICU Level of Service	B	
Analysis Period (min)			15			



# HCM Signalized Intersection Capacity Analysis

## 1: OR-224 & SE Harrison Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	126	41	40	189	319	59	1812	57	97	891	14
Future Volume (vph)	19	126	41	40	189	319	59	1812	57	97	891	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frb, ped/bikes		1.00			0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3020			3129		1719	3438	1538	1703	3406	1524
Flt Permitted		0.76			0.91		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2297			2863		1719	3438	1538	1703	3406	1524
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	20	135	44	43	203	343	63	1948	61	104	958	15
RTOR Reduction (vph)	0	29	0	0	110	0	0	0	25	0	0	6
Lane Group Flow (vph)	0	170	0	0	479	0	63	1948	36	104	958	9
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		17.3			17.3		6.8	52.4	52.4	6.8	52.4	52.4
Effective Green, g (s)		17.3			17.3		6.8	52.4	52.4	6.8	52.4	52.4
Actuated g/C Ratio		0.19			0.19		0.08	0.58	0.58	0.08	0.58	0.58
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		441			550		129	2001	895	128	1983	887
v/s Ratio Prot							0.04	c0.57		c0.06	0.28	
v/s Ratio Perm		0.07			c0.17				0.02			0.01
v/c Ratio		0.39			0.87		0.49	0.97	0.04	0.81	0.48	0.01
Uniform Delay, d1		31.7			35.3		39.9	18.1	8.0	41.0	10.9	7.9
Progression Factor		1.00			1.00		1.12	0.53	0.64	1.00	1.00	1.00
Incremental Delay, d2		0.6			14.1		2.1	11.8	0.1	31.0	0.8	0.0
Delay (s)		32.3			49.4		46.7	21.4	5.2	72.0	11.8	7.9
Level of Service		C			D		D	C	A	E	B	A
Approach Delay (s)		32.3			49.4			21.7			17.5	
Approach LOS		C			D			C			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.2				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			92.6%				ICU Level of Service				F	
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: OR-224 & SE Monroe Street

04/12/2019



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Traffic Volume (vph)	32	10	59	5	18	24	41	1877	14	5	953	16
Future Volume (vph)	32	10	59	5	18	24	41	1877	14	5	953	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1688			1709		1719	3438	1504	1687	3374	1509
Flt Permitted		0.91			0.96		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1568			1643		1719	3438	1504	1687	3374	1509
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	34	11	63	5	19	26	44	1997	15	5	1014	17
RTOR Reduction (vph)	0	58	0	0	24	0	0	0	4	0	0	5
Lane Group Flow (vph)	0	50	0	0	26	0	44	1997	11	5	1014	12
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		7.5			7.5		5.4	67.7	67.7	1.3	63.6	63.6
Effective Green, g (s)		7.5			7.5		5.4	67.7	67.7	1.3	63.6	63.6
Actuated g/C Ratio		0.08			0.08		0.06	0.75	0.75	0.01	0.71	0.71
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		130			136		103	2586	1131	24	2384	1066
v/s Ratio Prot							c0.03	c0.58		0.00	0.30	
v/s Ratio Perm		c0.03			0.02				0.01			0.01
v/c Ratio		0.39			0.19		0.43	0.77	0.01	0.21	0.43	0.01
Uniform Delay, d1		39.1			38.4		40.8	6.6	2.8	43.8	5.5	3.9
Progression Factor		1.00			1.00		1.06	0.55	1.00	1.18	0.38	1.00
Incremental Delay, d2		1.9			0.7		1.9	1.6	0.0	3.8	0.5	0.0
Delay (s)		41.0			39.1		45.3	5.2	2.8	55.4	2.6	3.9
Level of Service		D			D		D	A	A	E	A	A
Approach Delay (s)		41.0			39.1			6.0			2.9	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			6.7				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			72.4%				ICU Level of Service				C	
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis





















## 3: SE Oak Street & OR-224

04/12/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	49	170	87	80	278	193	88	919	17	138	1653	168
Future Volume (vph)	49	170	87	80	278	193	88	919	17	138	1653	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	3438	1511	1711	3438	1519	1719	3438	1538	1703	3406	1489
Flt Permitted	0.47	1.00	1.00	0.64	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	847	3438	1511	1157	3438	1519	1719	3438	1538	1703	3406	1489
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	50	173	89	82	284	197	90	938	17	141	1687	171
RTOR Reduction (vph)	0	0	76	0	0	55	0	0	7	0	0	49
Lane Group Flow (vph)	50	173	13	82	284	142	90	938	10	141	1687	122
Confl. Peds. (#/hr)	5		4	4		5	1					1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%	6%
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	13.2	13.2	13.2	13.2	13.2	21.9	8.7	51.1	51.1	12.2	54.6	54.6
Effective Green, g (s)	13.2	13.2	13.2	13.2	13.2	21.9	8.7	51.1	51.1	12.2	54.6	54.6
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.24	0.10	0.57	0.57	0.14	0.61	0.61
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	124	504	221	169	504	445	166	1952	873	230	2066	903
v/s Ratio Prot		0.05			c0.08	0.03	0.05	0.27		c0.08	c0.50	
v/s Ratio Perm	0.06		0.01	0.07		0.06			0.01			0.08
v/c Ratio	0.40	0.34	0.06	0.49	0.56	0.32	0.54	0.48	0.01	0.61	0.82	0.14
Uniform Delay, d1	34.8	34.5	33.1	35.3	35.7	27.9	38.8	11.6	8.5	36.7	13.8	7.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.66	1.00	0.60	1.76	3.13
Incremental Delay, d2	2.1	0.4	0.1	2.2	1.4	0.4	3.4	0.8	0.0	2.2	1.8	0.1
Delay (s)	37.0	34.9	33.2	37.5	37.2	28.3	38.6	8.5	8.5	24.1	26.1	23.9
Level of Service	D	C	C	D	D	C	D	A	A	C	C	C
Approach Delay (s)		34.7			34.1			11.0			25.8	
Approach LOS		C			C			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			23.8			HCM 2000 Level of Service		C				
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)		13.5				
Intersection Capacity Utilization			78.5%			ICU Level of Service		D				
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
4: OR-224 & SE Edison Street

04/12/2019

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	17	53	24	80	31	141	7	1802	0	116	938	19	
Future Volume (vph)	17	53	24	80	31	141	7	1802	0	116	938	19	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5	
Lane Util. Factor		1.00			1.00	0.88	1.00	0.95		1.00	0.95	1.00	
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt		0.97			1.00	0.85	1.00	1.00		1.00	1.00	0.85	
Flt Protected		0.99			0.97	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1759			1730	2621	1719	3438		1687	3374	1509	
Flt Permitted		0.93			0.70	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1652			1258	2621	1719	3438		1687	3374	1509	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	18	56	25	84	33	148	7	1897	0	122	987	20	
RTOR Reduction (vph)	0	15	0	0	0	126	0	0	0	0	0	6	
Lane Group Flow (vph)	0	84	0	0	117	22	7	1897	0	122	987	14	
Confl. Peds. (#/hr)	1					1							
Confl. Bikes (#/hr)			2										
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	5%	5%	5%	7%	7%	7%	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases		4			8		5	2		1	6		
Permitted Phases	4			8		8						6	
Actuated Green, G (s)		13.1			13.1	13.1	1.0	53.3		10.1	62.4	62.4	
Effective Green, g (s)		13.1			13.1	13.1	1.0	53.3		10.1	62.4	62.4	
Actuated g/C Ratio		0.15			0.15	0.15	0.01	0.59		0.11	0.69	0.69	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		240			183	381	19	2036		189	2339	1046	
v/s Ratio Prot							0.00	c0.55		c0.07	0.29		
v/s Ratio Perm		0.05			c0.09	0.01						0.01	
v/c Ratio		0.35			0.64	0.06	0.37	0.93		0.65	0.42	0.01	
Uniform Delay, d1		34.6			36.2	33.1	44.2	16.7		38.2	6.0	4.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.82	1.96	1.00	
Incremental Delay, d2		0.9			7.1	0.1	11.7	9.3		6.7	0.5	0.0	
Delay (s)		35.5			43.4	33.2	55.9	26.0		38.1	12.2	4.3	
Level of Service		D			D	C	E	C		D	B	A	
Approach Delay (s)		35.5			37.7			26.1			14.9		
Approach LOS		D			D			C			B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			23.5									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.84										
Actuated Cycle Length (s)			90.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			80.3%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis  
 5: SE 37th Avenue & SE Edison Street/SE International Way

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↘			↕	↗
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	49	120	0	0	44	47	0	98	42	124	0	204
Future Volume (vph)	49	120	0	0	44	47	0	98	42	124	0	204
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	58	143	0	0	52	56	0	117	50	148	0	243

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total (vph)	201	26	26	56	167	229	162
Volume Left (vph)	58	0	0	0	0	148	0
Volume Right (vph)	0	0	0	56	50	81	162
Hadj (s)	0.13	0.24	0.24	-0.46	-0.15	-0.07	-0.58
Departure Headway (s)	5.2	6.0	6.0	3.2	4.7	4.7	3.2
Degree Utilization, x	0.29	0.04	0.04	0.05	0.22	0.30	0.14
Capacity (veh/h)	651	548	548	1121	713	716	1121
Control Delay (s)	10.3	8.0	8.0	5.2	9.1	9.8	6.7
Approach Delay (s)	10.3	6.5			9.1	8.5	
Approach LOS	B	A			A	A	

Intersection Summary

Delay	8.8
Level of Service	A
Intersection Capacity Utilization	44.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis  
6: SE 32nd Avenue & SE Harrison Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↗		↖	↗			↖	↗		↖	↗	
Traffic Volume (vph)	108	123	11	21	387	19	50	143	16	16	116	119	
Future Volume (vph)	108	123	11	21	387	19	50	143	16	16	116	119	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00	
Satd. Flow (prot)	1656	1721		1752	1830			1821	1524		1764	1474	
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.95	1.00	
Satd. Flow (perm)	1656	1721		1752	1830			1620	1524		1680	1474	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	116	132	12	23	416	20	54	154	17	17	125	128	
RTOR Reduction (vph)	0	4	0	0	2	0	0	0	13	0	0	101	
Lane Group Flow (vph)	116	140	0	23	434	0	0	208	4	0	142	27	
Confl. Peds. (#/hr)	4					4			5	5			
Confl. Bikes (#/hr)												2	
Heavy Vehicles (%)	9%	9%	9%	3%	3%	3%	3%	3%	3%	7%	7%	7%	
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	5	2		1	6			4			8		
Permitted Phases							4		4	8		8	
Actuated Green, G (s)	7.2	32.7		1.1	26.6			12.7	12.7		12.7	12.7	
Effective Green, g (s)	7.2	32.7		1.1	26.6			12.7	12.7		12.7	12.7	
Actuated g/C Ratio	0.12	0.55		0.02	0.44			0.21	0.21		0.21	0.21	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	198	937		32	811			342	322		355	311	
v/s Ratio Prot	c0.07	0.08		0.01	c0.24								
v/s Ratio Perm								c0.13	0.00		0.08	0.02	
v/c Ratio	0.59	0.15		0.72	0.53			0.61	0.01		0.40	0.09	
Uniform Delay, d1	25.0	6.8		29.3	12.2			21.4	18.7		20.4	19.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	0.3		55.4	2.5			3.1	0.0		0.7	0.1	
Delay (s)	29.4	7.1		84.7	14.7			24.5	18.7		21.1	19.1	
Level of Service	C	A		F	B			C	B		C	B	
Approach Delay (s)		17.0			18.2			24.0			20.2		
Approach LOS		B			B			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			19.5		HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio			0.56										
Actuated Cycle Length (s)			60.0		Sum of lost time (s)					13.5			
Intersection Capacity Utilization			58.3%		ICU Level of Service					B			
Analysis Period (min)			15										
c Critical Lane Group													

7: SE Oak Street & SE Monroe Street Performance by approach


















Approach	NB	SE	NW	All
Denied Delay (hr)	0.1	0.0	0.1	0.2
Denied Del/Veh (s)	2.2	0.2	0.6	0.9
Total Delay (hr)	0.0	0.3	1.6	2.0
Total Del/Veh (s)	0.5	6.8	13.2	8.4
Stop Delay (hr)	0.0	0.3	1.3	1.6
Stop Del/Veh (s)	0.0	5.9	10.9	6.9
Total Stops	3	171	428	602
Stop/Veh	0.01	0.99	0.97	0.71
Vehicles Entered	230	172	437	839
Vehicles Exited	230	172	438	840
Hourly Exit Rate	230	172	438	840
Input Volume	235	178	435	848
% of Volume	98	96	101	99
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Total Network Performance

Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.9
Total Delay (hr)	2.2
Total Del/Veh (s)	9.2
Stop Delay (hr)	1.7
Stop Del/Veh (s)	7.3
Total Stops	602
Stop/Veh	0.71
Vehicles Entered	839
Vehicles Exited	841
Hourly Exit Rate	841
Input Volume	1696
% of Volume	50
Denied Entry Before	0
Denied Entry After	0

HCM Unsignalized Intersection Capacity Analysis  
 8: SE 37th Avenue & SE Monroe Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	98	82	59	226	1	172	38	48	1	60	30
Future Volume (vph)	4	98	82	59	226	1	172	38	48	1	60	30
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	110	92	66	254	1	193	43	54	1	67	34
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	206	321	193	97	102							
Volume Left (vph)	4	66	193	0	1							
Volume Right (vph)	92	1	0	54	34							
Hadj (s)	-0.18	0.09	0.57	-0.32	-0.11							
Departure Headway (s)	5.4	5.5	6.7	5.8	5.9							
Degree Utilization, x	0.31	0.49	0.36	0.16	0.17							
Capacity (veh/h)	611	622	497	576	533							
Control Delay (s)	10.8	13.6	12.2	8.7	10.1							
Approach Delay (s)	10.8	13.6	11.1		10.1							
Approach LOS	B	B	B		B							
Intersection Summary												
Delay			11.8									
Level of Service			B									
Intersection Capacity Utilization			52.2%		ICU Level of Service				A			
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis  
 9: SE 37th Avenue & SE Washington Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	23	1	35	10	1	3	13	206	3	1	196	8
Future Volume (Veh/h)	23	1	35	10	1	3	13	206	3	1	196	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	26	1	40	11	1	3	15	234	3	1	223	9
Pedestrians					1			1				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					3.5			3.5				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	498	498	228	538	500	236	232			238		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	498	498	228	538	500	236	232			238		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	95	97	100	100	99			100		
cM capacity (veh/h)	475	468	810	429	469	807	1330			1340		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	67	15	252	233								
Volume Left	26	11	15	1								
Volume Right	40	3	3	9								
cSH	631	476	1330	1340								
Volume to Capacity	0.11	0.03	0.01	0.00								
Queue Length 95th (ft)	9	2	1	0								
Control Delay (s)	11.4	12.8	0.6	0.0								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.4	12.8	0.6	0.0								
Approach LOS	B	B										
<b>Intersection Summary</b>												
Average Delay			1.9									
Intersection Capacity Utilization			30.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 10: SE 37th Avenue & SE Railroad Avenue





















04/12/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	156	145	96	31	63	180
Future Volume (Veh/h)	156	145	96	31	63	180
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	171	159	105	34	69	198
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)	1					
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	458	123			139	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	458	123			139	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	83			95	
cM capacity (veh/h)	534	927			1438	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	330	139	267			
Volume Left	171	0	69			
Volume Right	159	34	0			
cSH	851	1700	1438			
Volume to Capacity	0.39	0.08	0.05			
Queue Length 95th (ft)	46	0	4			
Control Delay (s)	11.9	0.0	2.3			
Lane LOS	B		A			
Approach Delay (s)	11.9	0.0	2.3			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			6.2			
Intersection Capacity Utilization			38.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis  
1: OR-224 & SE Harrison Street

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	271	58	57	191	170	65	1477	69	308	1768	32
Future Volume (vph)	5	271	58	57	191	170	65	1477	69	308	1768	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		1.00			0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3333			3209		1752	3505	1545	1752	3505	1547
Flt Permitted		0.95			0.73		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3158			2366		1752	3505	1545	1752	3505	1547
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	279	60	59	197	175	67	1523	71	318	1823	33
RTOR Reduction (vph)	0	21	0	0	140	0	0	0	37	0	0	12
Lane Group Flow (vph)	0	323	0	0	291	0	67	1523	34	318	1823	21
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1
Confl. Bikes (#/hr)			3						2			
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		14.8			14.8		5.2	42.8	42.8	18.9	56.5	56.5
Effective Green, g (s)		14.8			14.8		5.2	42.8	42.8	18.9	56.5	56.5
Actuated g/C Ratio		0.16			0.16		0.06	0.48	0.48	0.21	0.63	0.63
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		519			389		101	1666	734	367	2200	971
v/s Ratio Prot							0.04	c0.43		c0.18	0.52	
v/s Ratio Perm		0.10			c0.12				0.02			0.01
v/c Ratio		0.62			0.75		0.66	0.91	0.05	0.87	0.83	0.02
Uniform Delay, d1		35.0			35.8		41.5	21.9	12.7	34.3	13.0	6.3
Progression Factor		1.00			1.00		0.84	0.87	5.10	1.00	1.00	1.00
Incremental Delay, d2		2.3			7.6		12.1	7.5	0.1	18.8	3.8	0.0
Delay (s)		37.3			43.5		47.0	26.5	64.6	53.1	16.8	6.4
Level of Service		D			D		D	C	E	D	B	A
Approach Delay (s)		37.3			43.5			29.0			21.9	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			27.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			96.2%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
2: OR-224 & SE Monroe Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Traffic Volume (vph)	29	31	85	16	20	21	33	1572	14	22	1845	24
Future Volume (vph)	29	31	85	16	20	21	33	1572	14	22	1845	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1665			1770		1752	3505	1568	1752	3505	1521
Flt Permitted		0.94			0.82		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1574			1469		1752	3505	1568	1752	3505	1521
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	30	32	88	16	21	22	34	1621	14	23	1902	25
RTOR Reduction (vph)	0	63	0	0	19	0	0	0	4	0	0	8
Lane Group Flow (vph)	0	87	0	0	40	0	34	1621	10	23	1902	17
Confl. Peds. (#/hr)	1		3	3		1	4					4
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		10.3			10.3		4.5	63.3	63.3	2.9	61.7	61.7
Effective Green, g (s)		10.3			10.3		4.5	63.3	63.3	2.9	61.7	61.7
Actuated g/C Ratio		0.11			0.11		0.05	0.70	0.70	0.03	0.69	0.69
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		180			168		87	2465	1102	56	2402	1042
v/s Ratio Prot							c0.02	0.46		0.01	c0.54	
v/s Ratio Perm		c0.06			0.03				0.01			0.01
v/c Ratio		0.48			0.24		0.39	0.66	0.01	0.41	0.79	0.02
Uniform Delay, d1		37.4			36.3		41.4	7.4	4.0	42.7	9.7	4.5
Progression Factor		1.00			1.00		1.01	0.55	1.00	1.35	0.32	1.00
Incremental Delay, d2		2.0			0.7		1.7	0.8	0.0	2.8	1.6	0.0
Delay (s)		39.4			37.0		43.3	4.8	4.0	60.4	4.7	4.5
Level of Service		D			D		D	A	A	E	A	A
Approach Delay (s)		39.4			37.0			5.6			5.4	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			7.3				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			69.3%				ICU Level of Service				C	
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: SE Oak Street & OR-224

04/12/2019

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR	
Lane Configurations													
Traffic Volume (vph)	27	213	82	129	245	139	227	1688	53	104	1461	173	
Future Volume (vph)	27	213	82	129	245	139	227	1688	53	104	1461	173	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1730	3471	1506	1734	3505	1555	1752	3505	1547	1770	3539	1531	
Flt Permitted	0.52	1.00	1.00	0.58	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	954	3471	1506	1050	3505	1555	1752	3505	1547	1770	3539	1531	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	29	229	88	139	263	149	244	1815	57	112	1571	186	
RTOR Reduction (vph)	0	0	73	0	0	12	0	0	23	0	0	62	
Lane Group Flow (vph)	29	229	15	139	263	137	244	1815	34	112	1571	124	
Confl. Peds. (#/hr)	3		10	10		3	5		1	1		5	
Confl. Bikes (#/hr)			3									1	
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	2%	2%	2%	
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases		4			8	5	2			1	6		
Permitted Phases	4		4	8		8			2			6	
Actuated Green, G (s)	15.4	15.4	15.4	15.4	15.4	30.2	14.8	52.9	52.9	8.2	46.3	46.3	
Effective Green, g (s)	15.4	15.4	15.4	15.4	15.4	30.2	14.8	52.9	52.9	8.2	46.3	46.3	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17	0.34	0.16	0.59	0.59	0.09	0.51	0.51	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	163	593	257	179	599	599	288	2060	909	161	1820	787	
v/s Ratio Prot		0.07			0.08	0.04	c0.14	c0.52		0.06	0.44		
v/s Ratio Perm	0.03		0.01	c0.13		0.05			0.02			0.08	
v/c Ratio	0.18	0.39	0.06	0.78	0.44	0.23	0.85	0.88	0.04	0.70	0.86	0.16	
Uniform Delay, d1	31.9	33.1	31.2	35.7	33.4	21.5	36.5	15.9	7.8	39.7	19.1	11.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.06	0.72	2.23	0.70	1.36	2.63	
Incremental Delay, d2	0.5	0.4	0.1	18.8	0.5	0.2	14.7	4.2	0.1	9.4	4.4	0.3	
Delay (s)	32.4	33.5	31.3	54.4	33.9	21.7	53.2	15.5	17.5	37.1	30.2	30.7	
Level of Service	C	C	C	D	C	C	D	B	B	D	C	C	
Approach Delay (s)		32.9			35.8			19.9			30.7		
Approach LOS		C			D			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			26.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.88										
Actuated Cycle Length (s)			90.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			83.6%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

# HCM Signalized Intersection Capacity Analysis

## 4: OR-224 & SE Edison Street

04/12/2019





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗↘	↖	↗↘		↖	↗↘	↖
Traffic Volume (vph)	18	87	14	119	67	207	31	1482	0	85	1798	19
Future Volume (vph)	18	87	14	119	67	207	31	1482	0	85	1798	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00	0.88	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		0.98			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1835			1821	2752	1770	3539		1736	3471	1553
Flt Permitted		0.94			0.68	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1728			1269	2752	1770	3539		1736	3471	1553
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	19	93	15	127	71	220	33	1577	0	90	1913	20
RTOR Reduction (vph)	0	6	0	0	0	172	0	0	0	0	0	7
Lane Group Flow (vph)	0	121	0	0	198	48	33	1577	0	90	1913	13
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)		16.5			16.5	16.5	3.0	53.8		6.2	57.0	57.0
Effective Green, g (s)		16.5			16.5	16.5	3.0	53.8		6.2	57.0	57.0
Actuated g/C Ratio		0.18			0.18	0.18	0.03	0.60		0.07	0.63	0.63
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		316			232	504	59	2115		119	2198	983
v/s Ratio Prot							0.02	0.45		c0.05	c0.55	
v/s Ratio Perm		0.07			c0.16	0.02						0.01
v/c Ratio		0.38			0.85	0.09	0.56	0.75		0.76	0.87	0.01
Uniform Delay, d1		32.3			35.6	30.5	42.8	13.1		41.2	13.5	6.1
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.86	0.91	1.00
Incremental Delay, d2		0.8			24.9	0.1	11.0	2.4		13.2	2.7	0.0
Delay (s)		33.1			60.5	30.6	53.9	15.6		48.8	15.0	6.1
Level of Service		C			E	C	D	B		D	B	A
Approach Delay (s)		33.1			44.8			16.4			16.4	
Approach LOS		C			D			B			B	

Intersection Summary		
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.88	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	81.9%	13.5
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

HCM Unsignalized Intersection Capacity Analysis  
 5: SE 37th Avenue & SE Edison Street/SE International Way

04/12/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	146	33	0	0	175	228	0	150	14	52	0	205
Future Volume (vph)	146	33	0	0	175	228	0	150	14	52	0	205
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	160	36	0	0	192	251	0	165	15	57	0	225
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2					
Volume Total (vph)	196	96	96	251	180	132	150					
Volume Left (vph)	160	0	0	0	0	57	0					
Volume Right (vph)	0	0	0	251	15	75	150					
Hadj (s)	0.21	0.05	0.05	-0.65	-0.02	-0.25	-0.60					
Departure Headway (s)	5.3	5.6	5.6	3.2	5.1	4.9	3.2					
Degree Utilization, x	0.29	0.15	0.15	0.22	0.25	0.18	0.13					
Capacity (veh/h)	636	601	602	1122	655	663	1121					
Control Delay (s)	10.5	8.4	8.4	5.9	9.8	9.0	6.7					
Approach Delay (s)	10.5	7.0			9.8	7.8						
Approach LOS	B	A			A	A						
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			44.1%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis  
6: SE 32nd Avenue & SE Harrison Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↖	↗
Traffic Volume (vph)	132	443	18	31	255	18	43	136	32	52	156	128
Future Volume (vph)	132	443	18	31	255	18	43	136	32	52	156	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1736	1815		1736	1804			1859	1512		1811	1568
Flt Permitted	0.95	1.00		0.95	1.00			0.85	1.00		0.87	1.00
Satd. Flow (perm)	1736	1815		1736	1804			1596	1512		1588	1568
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	147	492	20	34	283	20	48	151	36	58	173	142
RTOR Reduction (vph)	0	2	0	0	3	0	0	0	28	0	0	110
Lane Group Flow (vph)	147	510	0	34	300	0	0	199	8	0	231	32
Confl. Peds. (#/hr)	11						11		20	20		
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	1%	1%	1%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.5	30.5		2.3	25.3			13.7	13.7		13.7	13.7
Effective Green, g (s)	7.5	30.5		2.3	25.3			13.7	13.7		13.7	13.7
Actuated g/C Ratio	0.12	0.51		0.04	0.42			0.23	0.23		0.23	0.23
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	217	922		66	760			364	345		362	358
v/s Ratio Prot	c0.08	c0.28		0.02	0.17							
v/s Ratio Perm								0.12	0.01		c0.15	0.02
v/c Ratio	0.68	0.55		0.52	0.39			0.55	0.02		0.64	0.09
Uniform Delay, d1	25.1	10.1		28.3	12.0			20.4	18.0		20.9	18.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	8.1	2.4		6.6	1.5			1.7	0.0		3.7	0.1
Delay (s)	33.2	12.5		34.9	13.6			22.1	18.0		24.6	18.4
Level of Service	C	B		C	B			C	B		C	B
Approach Delay (s)		17.1			15.7			21.5			22.2	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



7: SE Oak Street & SE Monroe Street Performance by approach

Approach	NB	SE	NW	All
Denied Delay (hr)	0.2	0.3	0.0	0.5
Denied Del/Veh (s)	1.5	3.1	0.3	1.6
Total Delay (hr)	0.2	1.6	1.2	3.0
Total Del/Veh (s)	1.3	19.0	14.2	9.8
Stop Delay (hr)	0.0	1.6	1.0	2.7
Stop Del/Veh (s)	0.0	19.1	12.1	8.7
Total Stops	13	237	303	553
Stop/Veh	0.03	0.77	0.99	0.50
Vehicles Entered	488	303	305	1096
Vehicles Exited	489	304	304	1097
Hourly Exit Rate	489	304	304	1097
Input Volume	494	298	288	1080
% of Volume	99	102	106	102
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Total Network Performance

Denied Delay (hr)	0.5
Denied Del/Veh (s)	1.6
Total Delay (hr)	3.2
Total Del/Veh (s)	10.6
Stop Delay (hr)	2.8
Stop Del/Veh (s)	9.0
Total Stops	553
Stop/Veh	0.50
Vehicles Entered	1096
Vehicles Exited	1094
Hourly Exit Rate	1094
Input Volume	2160
% of Volume	51
Denied Entry Before	0
Denied Entry After	0

HCM Unsignalized Intersection Capacity Analysis  
 8: SE 37th Avenue & SE Monroe Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	288	178	65	149	6	108	90	204	5	68	8
Future Volume (vph)	15	288	178	65	149	6	108	90	204	5	68	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	320	198	72	166	7	120	100	227	6	76	9
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	535	245	120	327	91							
Volume Left (vph)	17	72	120	0	6							
Volume Right (vph)	198	7	0	227	9							
Hadj (s)	-0.18	0.08	0.52	-0.47	0.00							
Departure Headway (s)	5.9	6.8	7.7	6.7	7.6							
Degree Utilization, x	0.88	0.46	0.26	0.60	0.19							
Capacity (veh/h)	595	494	445	507	430							
Control Delay (s)	37.9	15.5	12.1	18.1	12.4							
Approach Delay (s)	37.9	15.5	16.5		12.4							
Approach LOS	E	C	C		B							
Intersection Summary												
Delay			24.7									
Level of Service			C									
Intersection Capacity Utilization			65.9%		ICU Level of Service		C					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 9: SE 37th Avenue & SE Washington Street

04/12/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	16	1	23	3	1	1	37	361	8	2	256	24
Future Volume (Veh/h)	16	1	23	3	1	1	37	361	8	2	256	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	18	1	25	3	1	1	41	397	9	2	281	26
Pedestrians					1			6			1	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	784	787	300	814	796	404	307			407		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	784	787	300	814	796	404	307			407		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	97	99	100	100	97			100		
cM capacity (veh/h)	301	312	735	278	311	650	1259			1151		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	44	5	447	309								
Volume Left	18	3	41	2								
Volume Right	25	1	9	26								
cSH	454	322	1259	1151								
Volume to Capacity	0.10	0.02	0.03	0.00								
Queue Length 95th (ft)	8	1	3	0								
Control Delay (s)	13.8	16.4	1.0	0.1								
Lane LOS	B	C	A	A								
Approach Delay (s)	13.8	16.4	1.0	0.1								
Approach LOS	B	C										
<b>Intersection Summary</b>												
Average Delay			1.5									
Intersection Capacity Utilization			51.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 10: SE 37th Avenue & SE Railroad Avenue

04/12/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	105	102	335	185	165	149
Future Volume (Veh/h)	105	102	335	185	165	149
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	119	116	381	210	188	169
Pedestrians						2
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)	1					
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1031	488			591	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1031	488			591	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	43	80			81	
cM capacity (veh/h)	210	581			985	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	235	591	357			
Volume Left	119	0	188			
Volume Right	116	210	0			
cSH	360	1700	985			
Volume to Capacity	0.65	0.35	0.19			
Queue Length 95th (ft)	110	0	18			
Control Delay (s)	31.9	0.0	6.0			
Lane LOS	D		A			
Approach Delay (s)	31.9	0.0	6.0			
Approach LOS	D					
<b>Intersection Summary</b>						
Average Delay			8.1			
Intersection Capacity Utilization			62.2%	ICU Level of Service		B
Analysis Period (min)			15			