

Monroe Apartments

Transportation Impact Study

Milwaukie, Oregon

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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 37th 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 90th 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 37th 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 37th 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 37th Avenue where access spacing standards can be met. Accordingly, the proposed public access along SE 37th Avenue is planned at a location opposite of SE Washington Street. In addition, the emergency access along SE 37th 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 37th 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 37th Avenue;
6. SE Harrison Street at SE 32nd Avenue;
7. SE Railroad Avenue at SE Oak Street;
8. SE Monroe Street at SE 37th Avenue;
9. SE Washington Street at SE 37th Avenue (site access location); and
10. SE Railroad Avenue at SE 37th 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 37th 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 37th 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*.

Future bike-route improvements are expected to be constructed near the subject site. The Monroe Street Neighborhood Greenway is expected to provide a more comfortable bike route between SE 21st Avenue in Downtown Milwaukie and SE Linwood Avenue, mostly along SE Monroe Street. The current concept of the



bicycle route includes allowing bikes to travel along the railroad on the southern edge of the subject property between SE Oak Street and SE Washington Street.

The proposed Monroe Apartments will construct a multi-use path along the southern edge of the site (adjacent to the railroad) between SE Oak Street and SE 37th Avenue. The bikes that are using the Neighborhood Greenway will be able to use off-street infrastructure between the new multi-use path and the site's access to SE 37th Avenue, where crossing improvements are expected to be constructed to connect to SE Washington Street to the east.

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 10.

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 32nd 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.

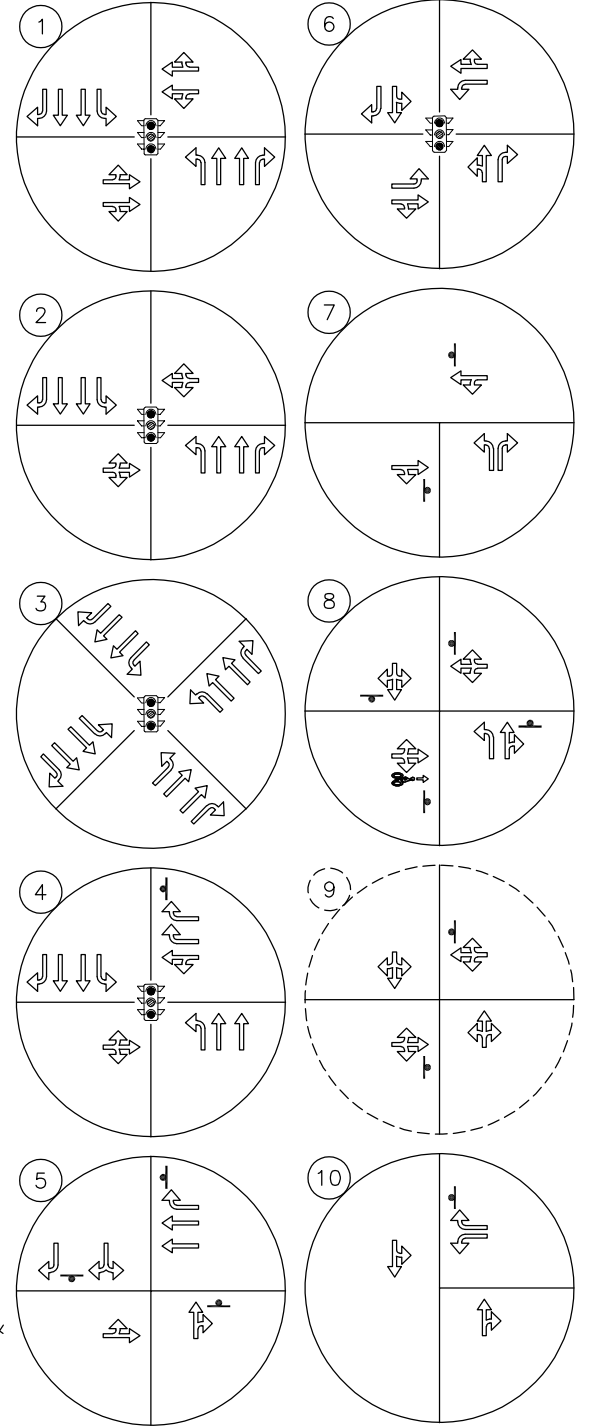
TriMet bus line #75 – *Cesar Chavez/ Lombard* provides frequent service between Pier Park in the St. Johns Neighborhood and Milwaukie City Center, with notable stops near Roosevelt High School, Columbia Park, N Lombard Transit Center, NAYA, Hollywood/NE 42nd Avenue Transit Center, Reed College, Providence Milwaukie Hospital, and Ledding Library. The nearest bus stops to the site are located along SE Harrison Street just west of SE 32nd Avenue and along SE 32nd 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



No Scale





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*¹ 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

¹ Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10th 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.

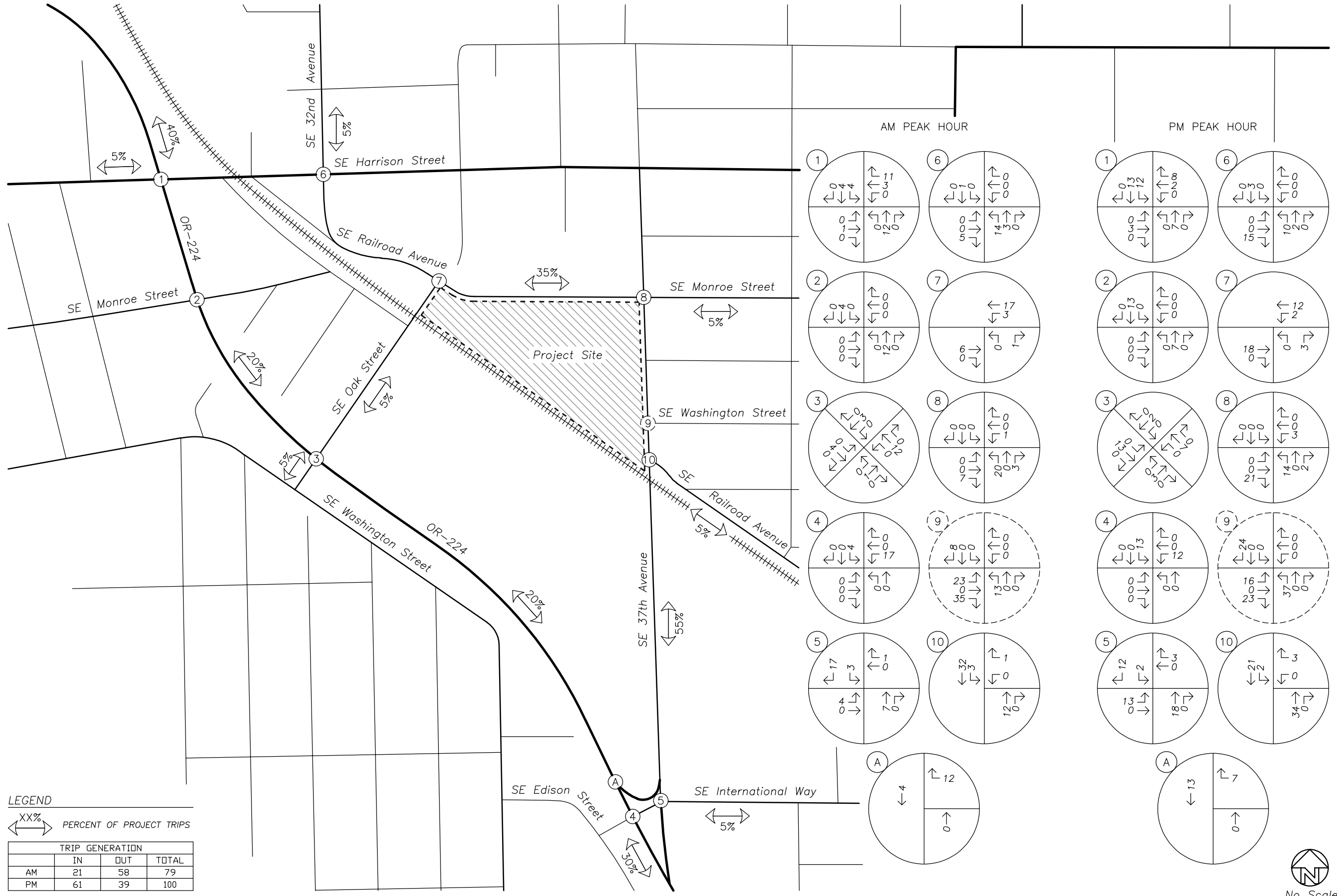
Primarily using the existing traffic volumes and the turning movements collected at the study intersections, the following trip distribution was estimated and used for analysis:

- 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 32nd 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.

All trips were assumed to enter and exit the site's primary access to SE 37th Avenue opposite of SE Washington Street.

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 13.

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



LEGEND

XX% PERCENT OF PROJECT TRIPS

TRIP GENERATION			
	IN	OUT	TOTAL
AM	21	58	79
PM	61	39	100





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*². 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 37th 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.

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



Traffic Volumes

Existing Conditions

Traffic counts were conducted at the study intersections on Thursday, February 7th, 2019 and Tuesday/Wednesday, April 9th/10th, 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 17 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, as per methodologies in ODOT's *Analysis Procedures Manual*. This growth rate was 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.

In addition to the traffic volume growth described above, trips associated with several developments in the site vicinity, that are currently approved but not yet fully constructed, were added to the calculated background volumes. These projects were assumed to be completed and occupied prior to year 2022 and include the following projects:

- Axeltree (11125 SE 21st Avenue), which includes the construction of 110 apartment units with 7,000 square-foot retail/restaurant;
- The conversion of a 32,500 square-foot fitness facility at 4330 SE International Way into office and warehousing;
- Keil Crossing (4217 SE Railroad Avenue), a 19-lot subdivision;
- Mission Park (5126 SE King Road), a 14-lot subdivision;
- A 15-unit apartment building at 6115 SE Harmony Road;
- A 2-lot partition with construction of a single-family dwelling at SE 49th Avenue and SE Mullan Street;
- Harmony Road Mini-Storage (5945/5965 SE Harmony Road), a 1,005-unit mini-storage facility;



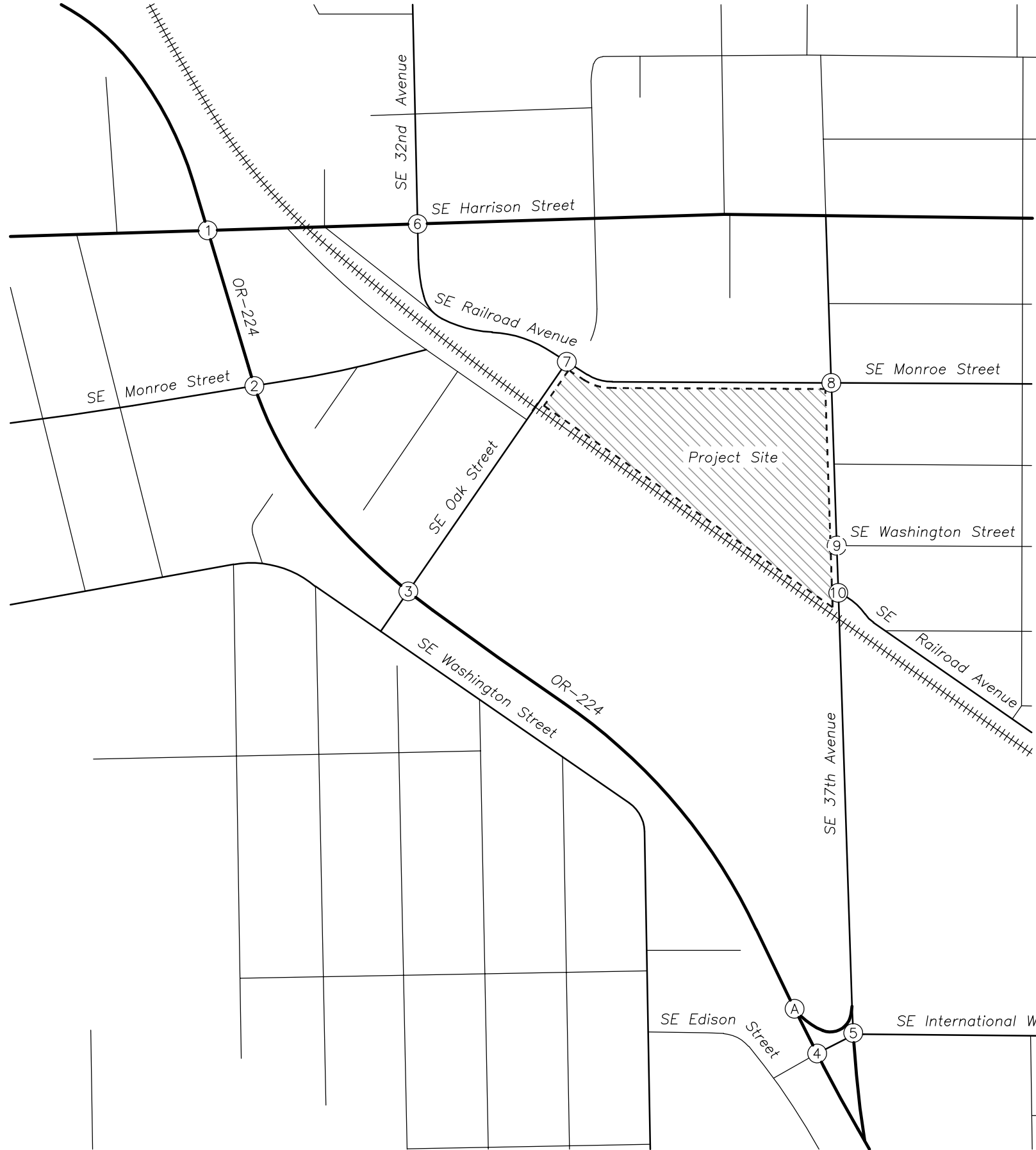
- Northwest Housing Alternatives (2316 SE Willard Street), which includes the construction of a temporary shelter for eight families, 28-unit multifamily housing, and a 12,500 square-foot office building;
- A 4-lot subdivision at 4543 SE Logus Road;
- Ledding Library (10660 SE 21st Avenue), an 18,000 square-foot library;
- Renovations to the Milwaukie High School, which include increasing the size of the campus by 43,500 square feet;
- Breakside Brewing (5821 SE International Way), which converts 2,487 square feet of office/retail space into 675 square feet of production, 472 square feet of office, and a 1,340 square-foot taproom;
- Decibel Sound and Drink (11380 SE 21st Avenue), which converts a 3,400 square-foot manufacturing facility into 1,300 square feet of office and a 1,600 square-foot tap room;
- Hillside Park redevelopment, a planned development on SE Hillside Court west of SE 32nd Avenue that adds 213 new dwelling units; and
- Bonaventure Senior Living (13333 SE Rusk Road), which includes the construction of 170 units of senior housing, 78 independent living suites, 60 assisted living suites, and 32 memory care suites.

Figure 4 on page 18 shows the projected year 2022 background traffic volumes at the study intersections during the morning and evening peak hours.

Buildout Conditions

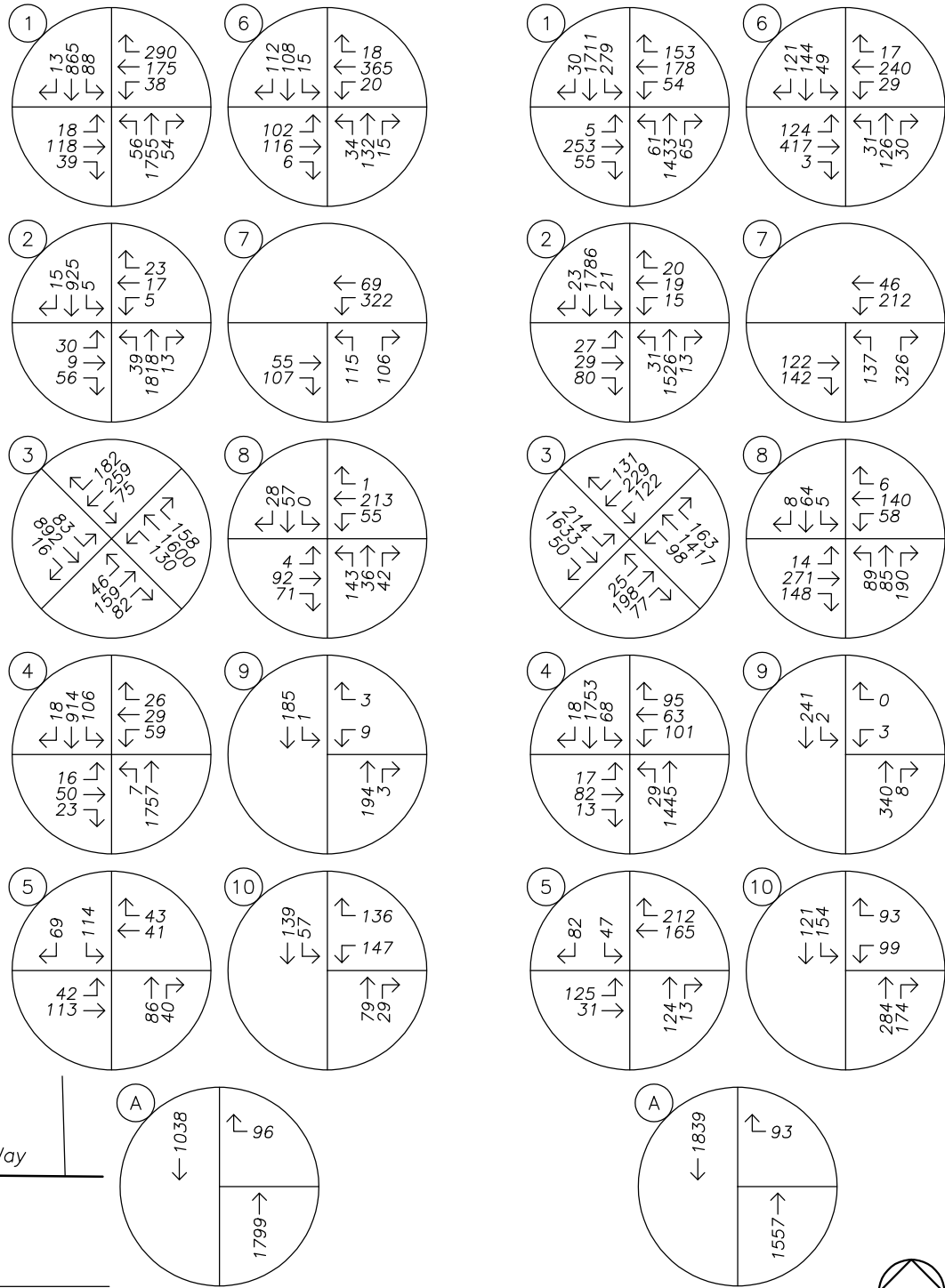
Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2022 background traffic volumes to obtain the expected year 2022 buildout volumes.

Figure 5 on page 19 shows the projected 2022 site buildout year traffic volumes at the study intersections during the morning and evening peak hours.



AM PEAK HOUR

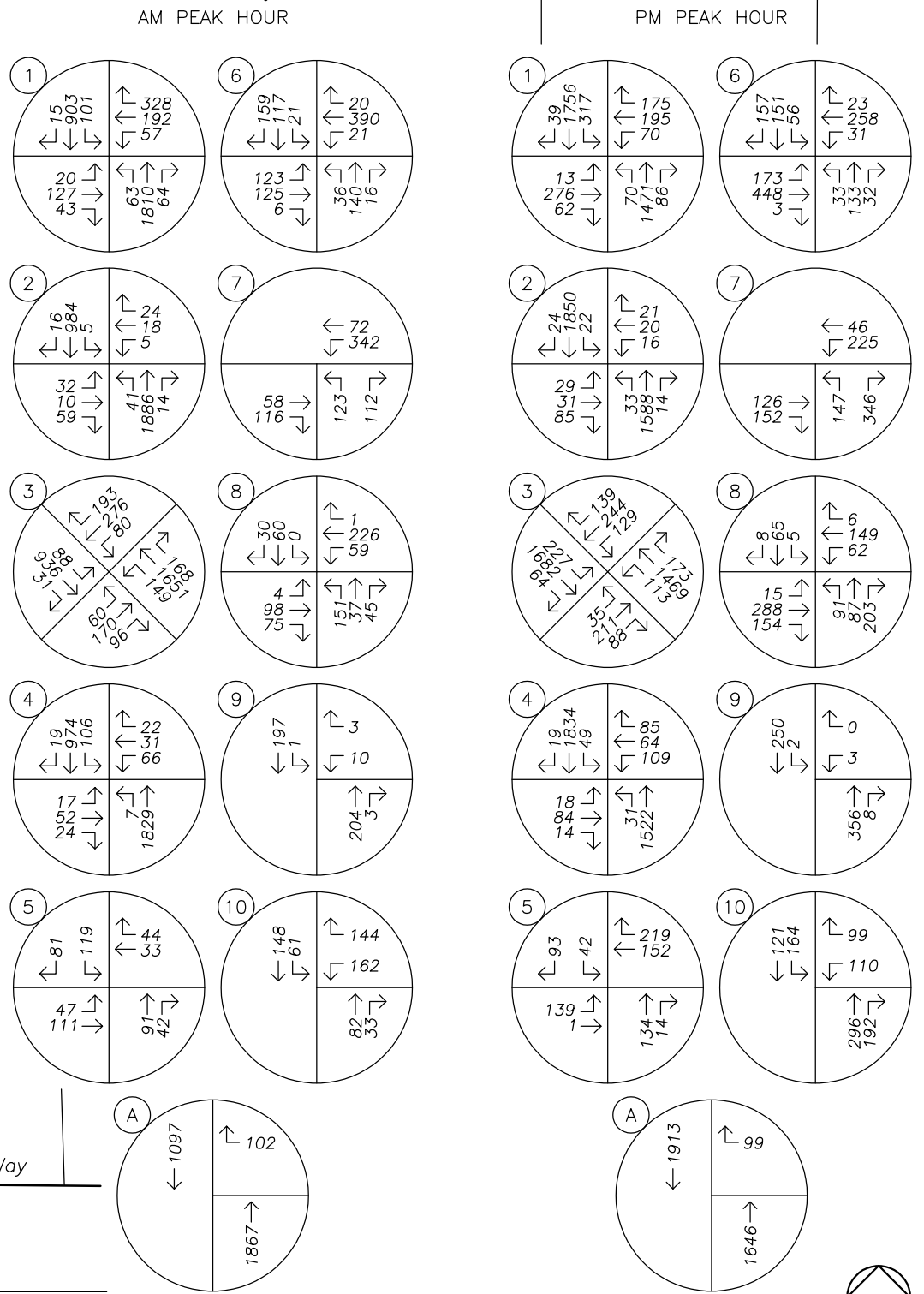
PM PEAK HOUR



No Scale

TRAFFIC VOLUMES
Existing Conditions
AM & PM Peak Hours

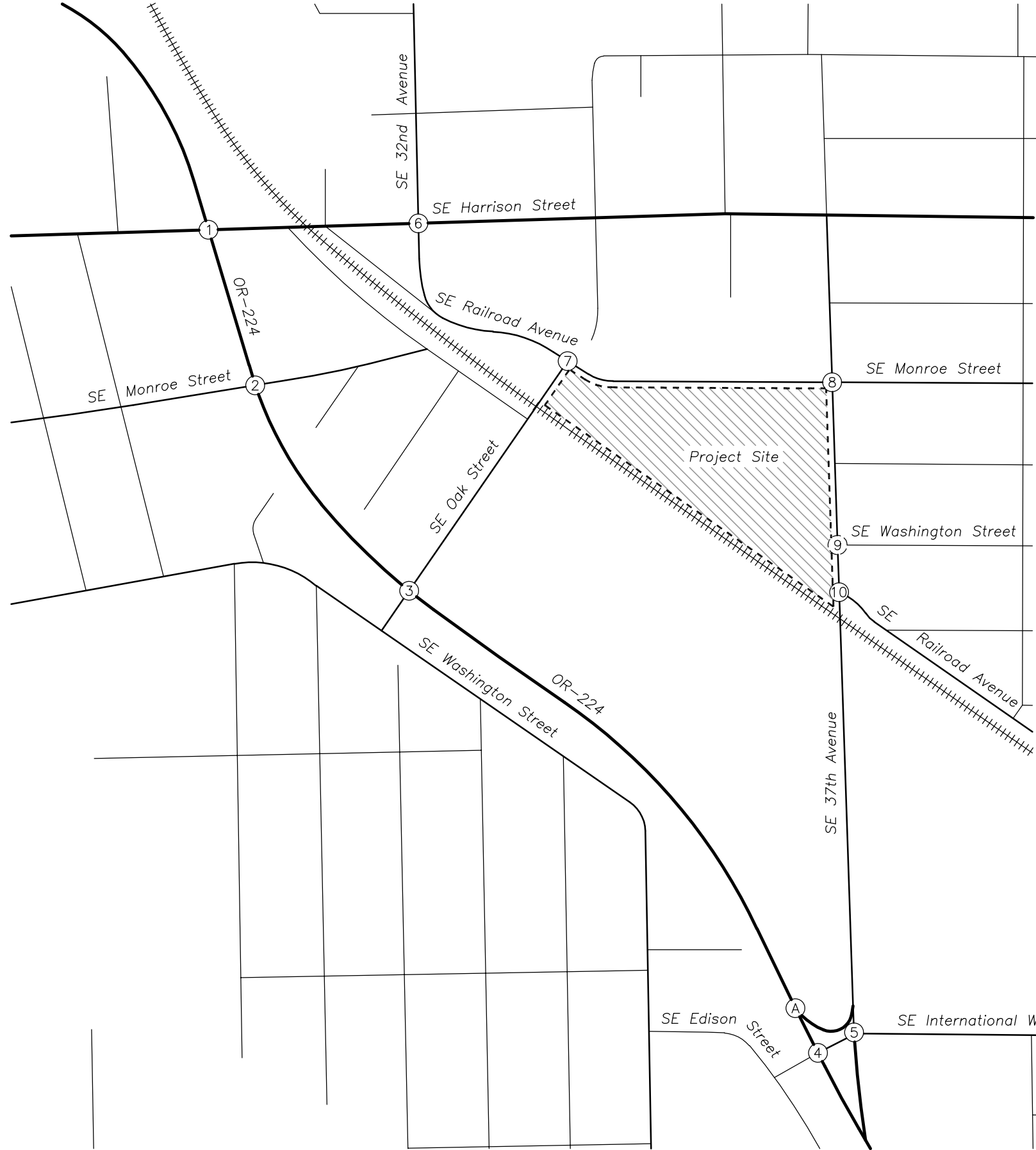




No Scale

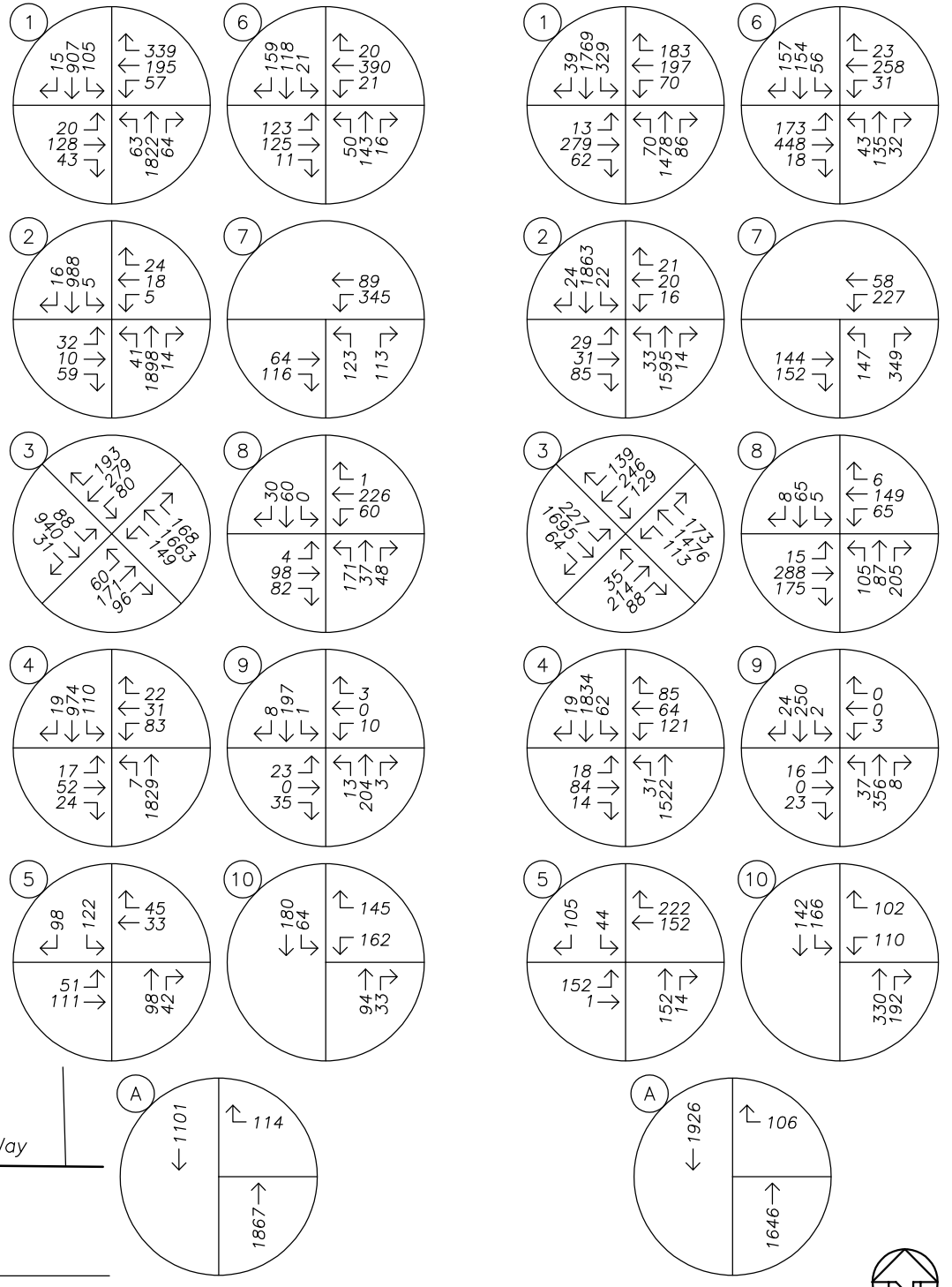


TRAFFIC VOLUMES
Year 2022 Background Conditions
AM & PM Peak Hours



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 90th percentile crash rates should be “flagged for further analysis”. For signalized intersections in urban settings, the 90th 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 25th, 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 90th 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 37th 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*³. 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 37th Avenue

SE 37th 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 Milwaukee Public Works Standards* (revised November 28th, 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 37th 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 37th 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

³ American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th 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 37th 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 37th 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 37th 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 37th Avenue is planned at a location opposite of SE Washington Street. In addition, the emergency access along SE 37th 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).

Figure 6 on page 28 depicts the available pedestrian route to Milwaukie High School & Milwaukie Academy of the Arts located southwest of the site.

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 32nd 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 32nd 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 32nd Avenue and along the south side of SE Roswell Street.

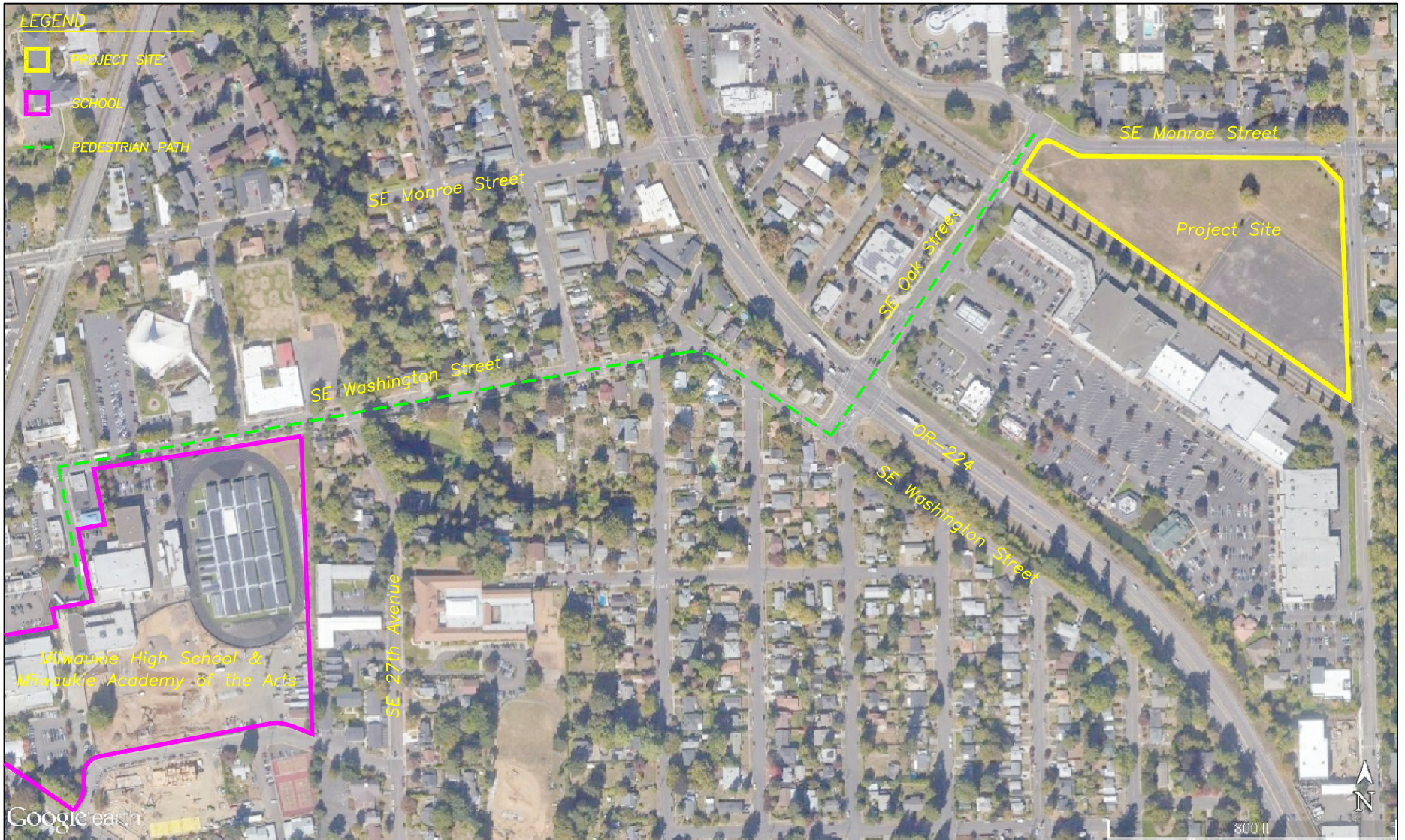
Figure 7 on page 29 depicts the available pedestrian route to Ardenwald Elementary School located north of the site.



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 37th Avenue (segment north of OR-224), SE Edison Street, SE 37th Avenue (segment south of OR-224), SE Grogan Avenue, and SE 36th Avenue. Sidewalks are generally complete along the west side of SE 37th Avenue (segment north of OR-224), both sides of SE Edison Street, east side of SE 37th Avenue (segment south of OR-224), both sides of SE Grogan Avenue, and both sides of SE 36th Avenue. Relevant marked crossings are available across SE 37th 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 37th 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.

Figure 8 on page 30 depicts the available pedestrian route to Rowe Middle School located south of the site.

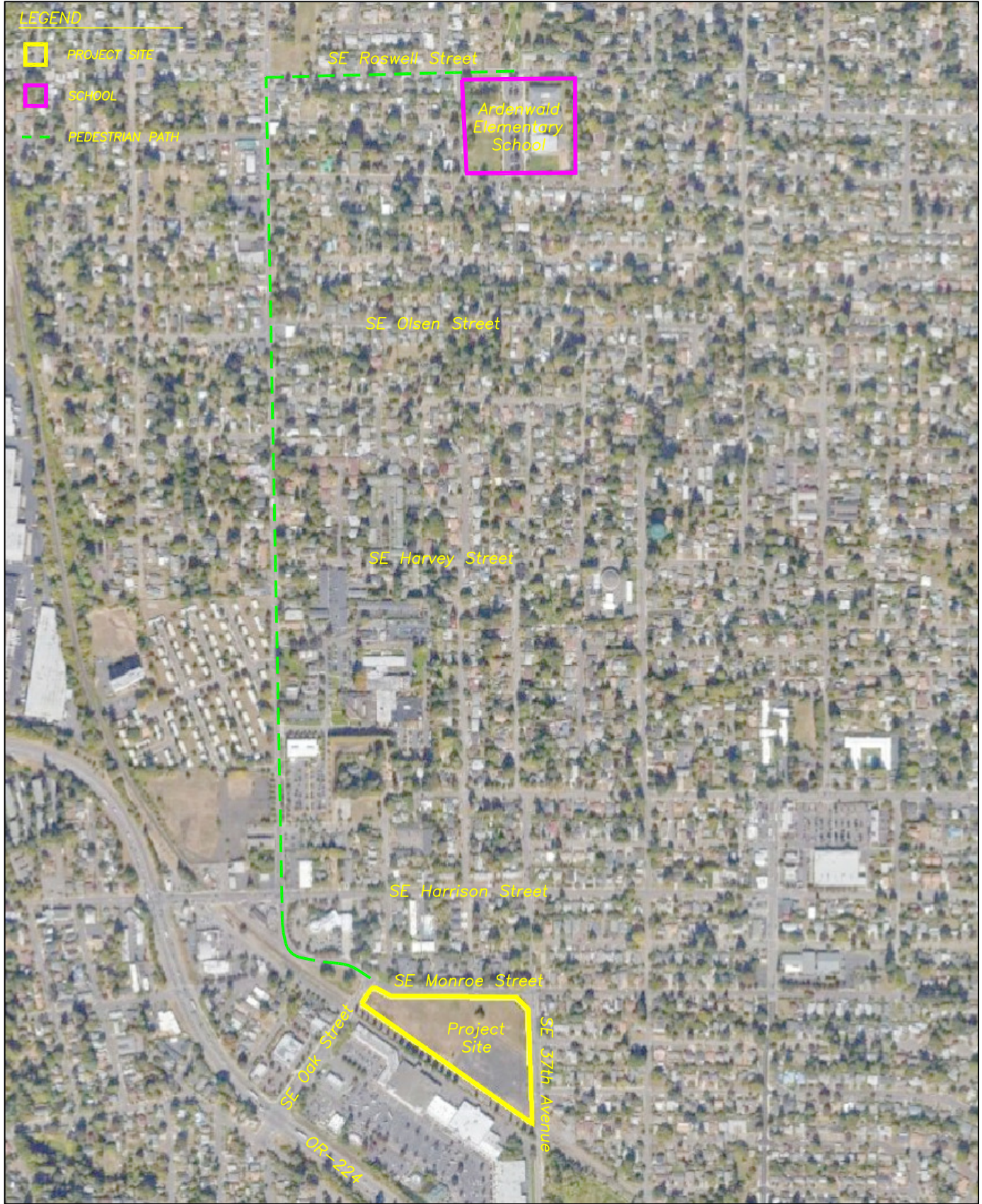


PEDESTRIAN WALKING PATHS
 Milwaukie High School & Milwaukie Academy of the Arts



FIGURE
6

PAGE
27



PEDESTRIAN WALKING PATHS
Ardenwald Elementary





PEDESTRIAN WALKING PATHS
Rowe Middle School



FIGURE
8

PAGE
29



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 most recent edition of the *Highway Capacity Manual*⁴ (HCM). Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates 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. The v/c ratios for signalized intersections were post-processed as per methodologies outlined in the APM.

SE Railroad Avenue at SE Oak Street Analysis

Preliminary analysis results utilizing HCM methodologies at the intersection of SE Railroad Avenue at SE Oak Street indicate the westbound approach at the intersection operates at LOS F under existing conditions during both the morning and evening peak hours (with 83 seconds and 94 seconds of delay, respectively). Understanding that the HCM methodologies may be overstating vehicle delay due to the atypical intersection configuration, additional field observations were conducted during the peak 15 minutes of the morning (7:45 AM to 8:00 AM) and evening (5:05 PM to 5:20 PM) peaks on Tuesday, March 12th, 2019. Based on observations during these periods, average delays at the intersection were estimated to be less than 15 seconds.

An intersection delay study was conducted in the field for the westbound approach of the intersection on Tuesday, September 3rd, 2019. Field observations were conducted between 4:55 PM and 5:55 PM and included vehicle delays resulting from a westbound queue waiting for a train to accelerate past the crossing on SE Oak Street. According to the intersection delay study, a total of 251 vehicles used the westbound approach with an average control delay of 13.4 seconds.

Traffic conditions observed during the September 3rd, 2019, period were compared to video collected as part of the traffic counts for February 7th, 2019. Vehicle delays and volumes during the September 3rd period were consistent with delays and volumes observed in the video.

Since the HCM methodologies significantly overstated vehicle delays, field measured delays at the intersection of SE Railroad Avenue at SE Oak Street were compared to a SimTraffic model prepared using the existing

⁴ Transportation Research Board, *Highway Capacity Manual*, 6th Edition, 2016.



traffic counts. According to an averaging of five simulation trials, average westbound delays were reported to be 13.3 seconds in the SimTraffic model. Since the simulation nearly reflects real-world delay measured in the field, the SimTraffic simulation methodology was used to estimate future delays at the SE Railroad Avenue at SE Oak Street intersection.

OR 224 at SE Edison St and SE International Way at SE 37th Ave

The operational methodologies in the HCM are not able to analyze the current configuration of the SE International Way at SE 37th Avenue intersection. Additionally, the HCM does not provide methodologies to analyze the two intersections of SE International Way at SE 37th Avenue and Oregon Highway 224 at SE Edison Street as a contiguous intersection. It should be noted that the City of Milwaukie's most recent Transportation System Plan update only reviewed the operation of the Oregon Highway 224 at SE Edison Street intersection and did not evaluate vehicle delays at the stop-controlled intersection of SE 37th Avenue at SE International Way.

Traffic counts collected at the two intersections did not identify a specific volume for the free right-turn movement for the westbound approach to Oregon Highway 224 nor did it separate the southbound right-turn movements from SE 37th Avenue onto SE Edison Street or Oregon Highway 224. Therefore, analysis assumed that the number of southbound vehicles utilizing the free right-turn movement on Oregon Highway 224 was proportional to the number of right turns observed at the intersection of Oregon Highway 224 at SE Edison Street. Since these right turns would not be expected to travel through the signal (it is a free movement in a separate lane), they were removed from the signalized right-turn volume.

To evaluate the delays at SE Industrial Way at SE 37th Avenue, the eastbound approach from Oregon Highway 224 had to be evaluated as being under yield control. It is assumed that the estimated delay provided by the HCM methodology using yield control for the eastbound approach would be conservative and actual delays for the westbound, northbound, and southbound approaches would be similar to the values reported.

Based on the capacity results, the westbound approach on SE International Way is expected to experience the highest delay when observing the two intersections together. A westbound vehicle is expected to experience less than 10 seconds of control delay from the stop sign at SE 37th Avenue (corresponding to LOS A) and then experience less than 68 seconds of approach delay from the traffic signal (corresponding to LOS E for the approach). Even with the additional delay from the nearby stop-controlled intersection, the average delay at the signalized intersection of Oregon Highway 224 at SE Edison Street is estimated to be less than 23 seconds, corresponding to an overall LOS of C or better.

Analysis Results

The v/c, delay, and LOS results of the capacity analysis are shown in Table 7 for the morning and evening peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.



Table 7: Intersection Capacity Analysis Summary

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1 SE Harrison Street at OR-224						
2019 Existing Conditions	C	31	0.86	C	27	0.86
2022 Background Conditions	D	40	0.95	C	33	0.95
2022 Buildout Conditions	D	43	0.96	D	35	0.97
2 SE Monroe Street at OR-224						
2019 Existing Conditions	A	8	0.73	A	7	0.74
2022 Background Conditions	A	8	0.76	A	7	0.74
2022 Buildout Conditions	A	8	0.76	A	7	0.75
3 SE Oak Street at OR-224						
2019 Existing Conditions	B	19	0.74	C	25	0.88
2022 Background Conditions	C	20	0.78	C	27	0.92
2022 Buildout Conditions	C	20	0.78	C	27	0.92
4 SE Edison Street at OR-224						
2019 Existing Conditions	B	15	0.75	B	19	0.89
2022 Background Conditions	B	16	0.79	C	20	0.93
2022 Buildout Conditions	B	20	0.83	C	22	0.99
5 SE International Way at SE 37th Avenue						
2019 Existing Conditions	A	9	-	A	9	-
2022 Background Conditions	A	10	-	A	9	-
2022 Buildout Conditions	A	10	-	A	10	-

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
6 SE Harrison Street at SE 32nd Avenue						
2019 Existing Conditions	B	20	0.64	C	22	0.79
2022 Background Conditions	C	21	0.69	C	27	0.91
2022 Buildout Conditions	C	24	0.77	C	29	0.92
7 SE Railroad Avenue at SE Oak Street*						
2019 Existing Conditions	B	10	-	B	13	-
2022 Background Conditions	B	11	-	C	18	-
2022 Buildout Conditions	B	14	-	C	20	-
8 SE Monroe Street at SE 37th Avenue						
2019 Existing Conditions	B	11	-	C	19	-
2022 Background Conditions	B	12	-	C	22	-
2022 Buildout Conditions	B	12	-	C	24	-
9 SE Washington Street at SE 37th Avenue						
2019 Existing Conditions	B	11	0.02	B	13	0.01
2022 Background Conditions	B	11	0.02	B	13	0.01
2022 Buildout Conditions	B	13	0.11	C	16	0.10
10 SE Railroad Avenue at SE 37th Avenue						
2019 Existing Conditions	B	13	0.27	D	31	0.45
2022 Background Conditions	B	14	0.31	E	38	0.54
2022 Buildout Conditions	C	15	0.34	E	46	0.60

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 90th 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 37th 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 37th 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 37th Avenue where access spacing standards can be met. Accordingly, the proposed public access along SE 37th Avenue is planned at a location opposite of SE Washington Street. In addition, the emergency access along SE 37th 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.



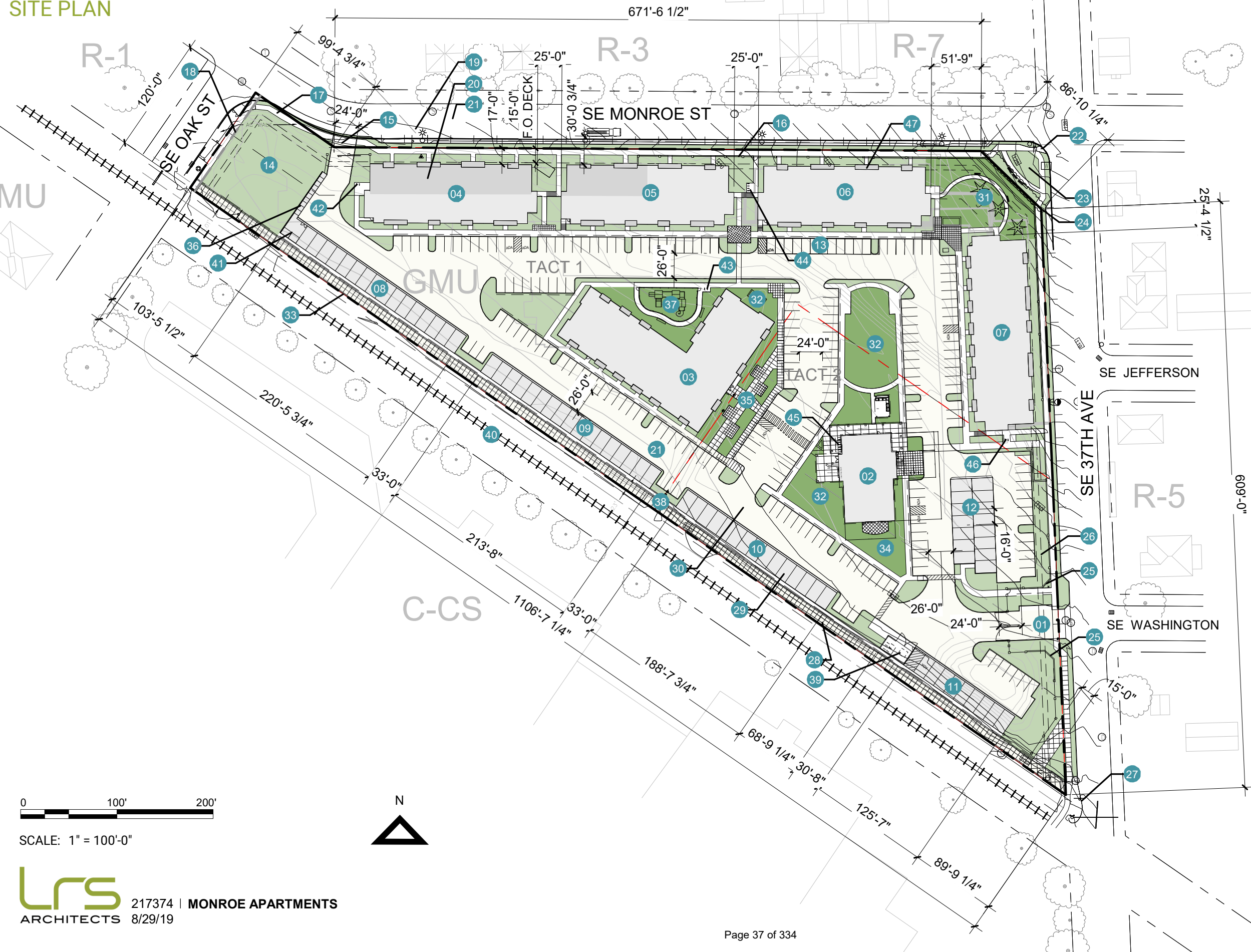
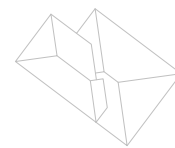
Appendix

SITE PLAN REVIEW

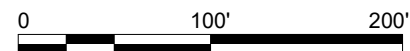
SITE PLAN

KEYNOTES XX

GMU



- 01 ENTRY / EXIT DRIVEWAY
- 02 CLUBHOUSE, 2 STORY, 5,784 SF
- 03 BUILDING 1, 5 STORIES, 84 UNITS, TYPE III, 74,641 SF
- 04 BUILDING 2, 3 STORIES, 36 UNITS, TYPE V, 30,000 SF
- 05 BUILDING 3, 3 STORIES, 36 UNITS, TYPE V, 30,000 SF
- 06 BUILDING 4, 3 STORIES, 36 UNITS, TYPE V, 30,000 SF
- 07 BUILDING 5, 3 STORIES, 42 UNITS, TYPE V, 34,200 SF
- 08 GARAGE 1 (G1), 20 PARKS, 5,188 SF
- 09 GARAGE 2 (G2), 17 PARKS, 4,701 SF
- 10 GARAGE 3 (G3), 15 PARKS, 4,150 SF
- 11 GARAGE 4 (G4), 10 PARKS, 2,763 SF
- 12 GARAGE 5 W/ ADA STALL (G5), 15 PARKS, 4,109 SF
- 13 CARPORT, 12 PARKS, 1,872 SF
- 14 BIOSWALE
- 15 GATED FIRE ACCESS ONLY
- 16 42" CONTINUOUS GATED FENCE
- 17 PUBLIC SIDEWALK EASEMENT
- 18 6' ROW DEDICATION FOR FUTURE SIDEWALK
- 19 6' BIKE LANE
- 20 LIVE WORK UNIT, TYPICAL
- 21 AERIAL APPARATUS
- 22 EXISTING ADA RAMP
- 23 ENHANCED PUBLIC POCKET PARK
- 24 NEW 5' PUBLIC SIDEWALK, CURB, AND GUTTER
- 25 MONUMENT SIGN ON WALL
- 26 15' MINIMUM SETBACK 20' MAXIMUM
- 27 GUARDRAIL
- 28 10' PEDESTRIAN PATH / 15' EASEMENT
- 29 PRIVATE GARAGES, TYPICAL
- 30 FIRE TRUCK AERIAL ACCESS LOOP
- 31 DOG WALK
- 32 OUTDOOR AREA
- 33 ODOT REQUIRED 8' FENCE
- 34 GARDEN
- 35 PLAZA
- 36 PERSONAL STORAGE, 10 UNITS
- 37 PLAYGROUND
- 38 BIKE PATH
- 39 TRASH AREA
- 40 RAIL LINE
- 41 BIKE STORAGE WITH DOUBLE DOCKER RACKS - 24 PARKING
- 42 BIKE RACKS - 3 PARKING
- 43 BIKE RACKS - 3 PARKING
- 44 BIKE RACKS - 4 PARKING
- 45 BIKE RACKS - 6 PARKING
- 46 BIKE RACKS - 3 PARKING
- 47 5' DEEP PATIO, TYP.



SCALE: 1" = 100'-0"





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	21	58	79

PM PEAK HOUR

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

	Enter	Exit	Total
Directional Distribution	61%	39%	
Trip Ends	61	39	100

WEEKDAY

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

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	637	637	1,274

SATURDAY

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

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	564	564	1,128

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

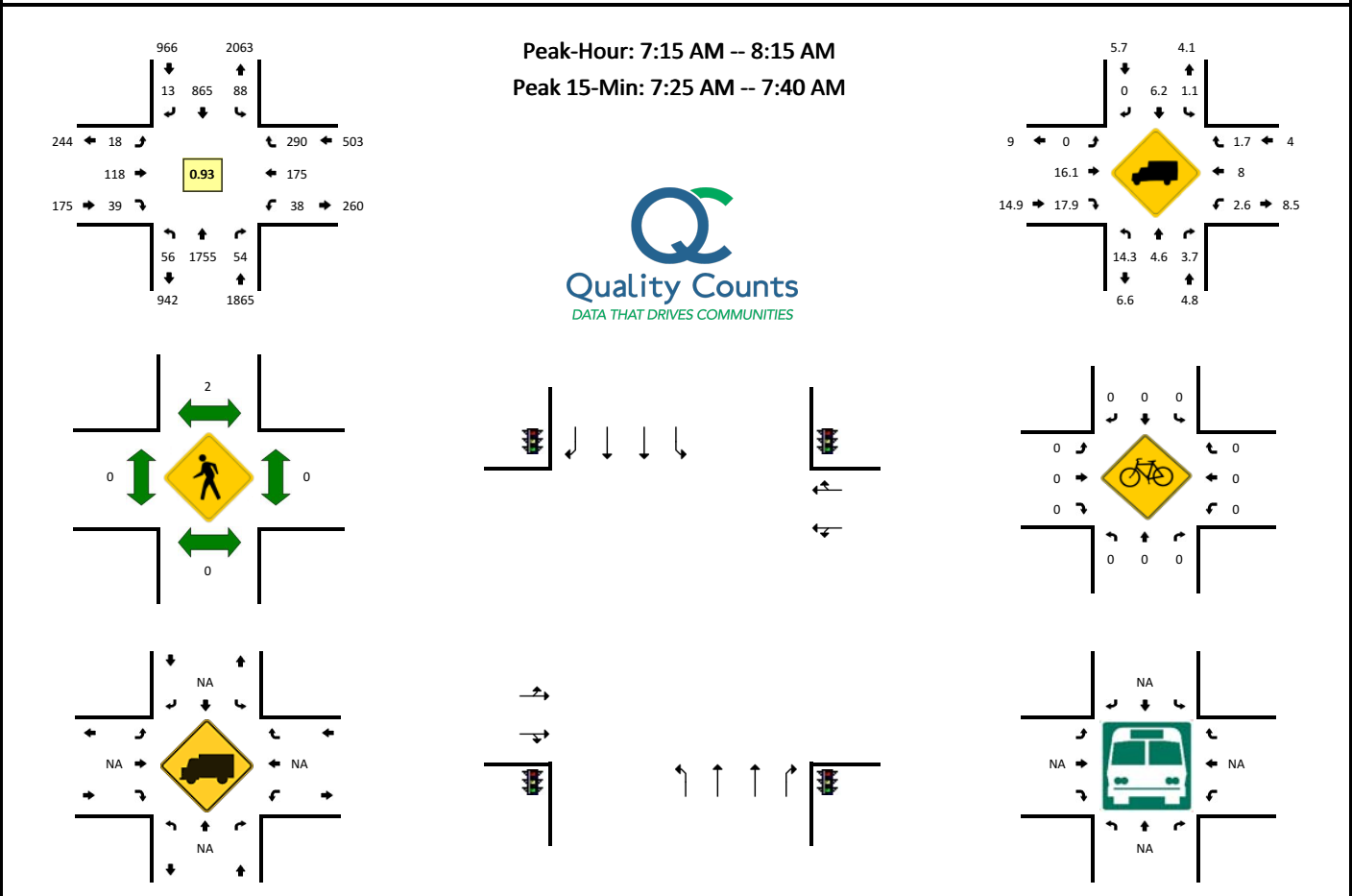
<i>Peak Period</i>	12:00 - 5:00 a.m.	
<i>Number of Study Sites</i>	21	
<i>Avg. Size of Study Sites</i>	311	dwelling units
<i>Avg. Peak Period Parking Demand</i>	1.23	vehicles per dwelling unit
<i>Standard Deviation</i>	0.32	
<i>Coefficient of Variation</i>	21%	
<i>Range</i>	0.59-1.94	vehicles per dwelling 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	288
85th Percentile Parking Demand	454

Source: PARKING GENERATION, Fourth Edition

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

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

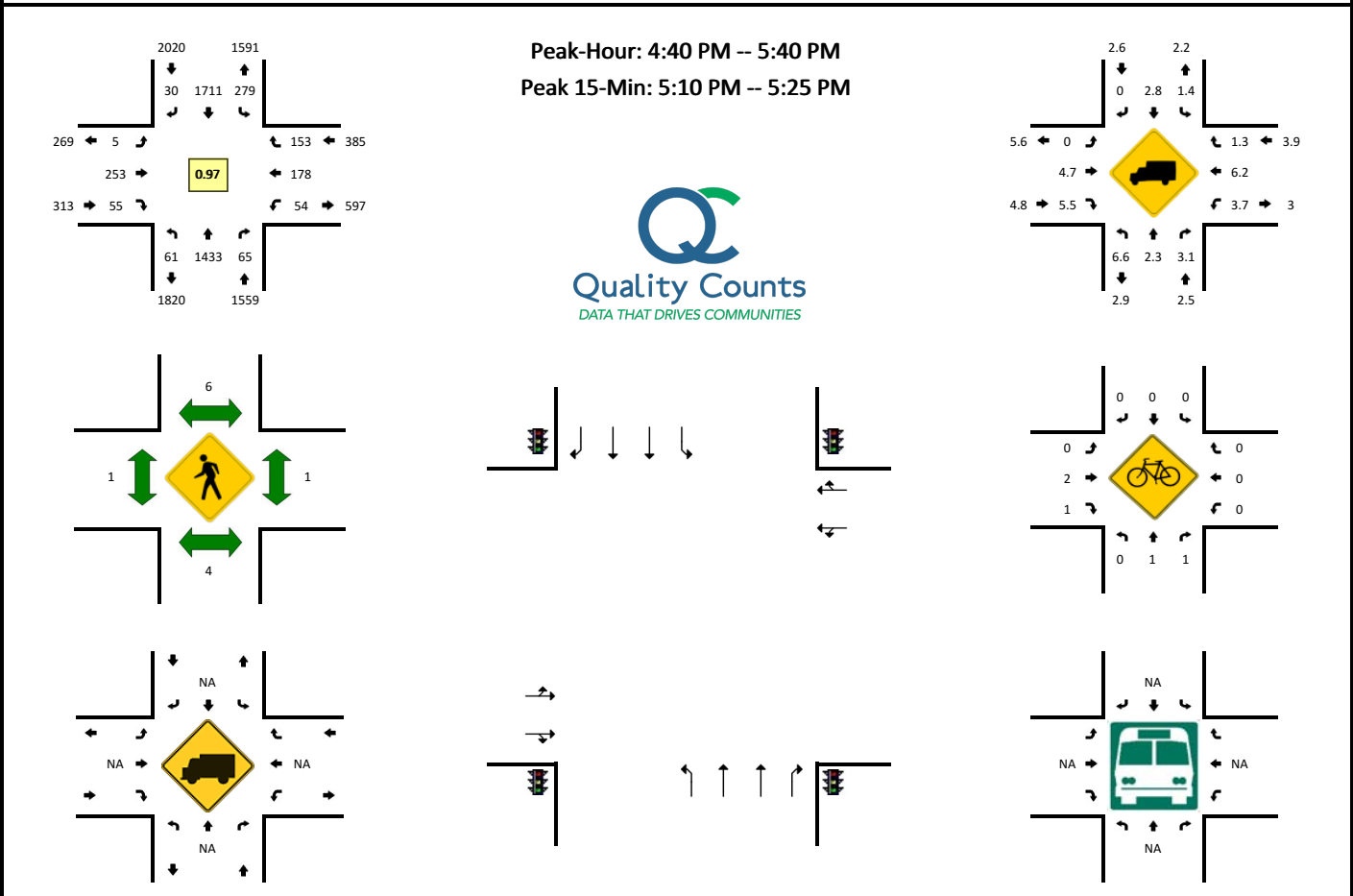


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Harrison St (Eastbound)				SE Harrison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	149	1	0	2	65	0	0	1	5	6	0	6	18	28	0	286	
7:05 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

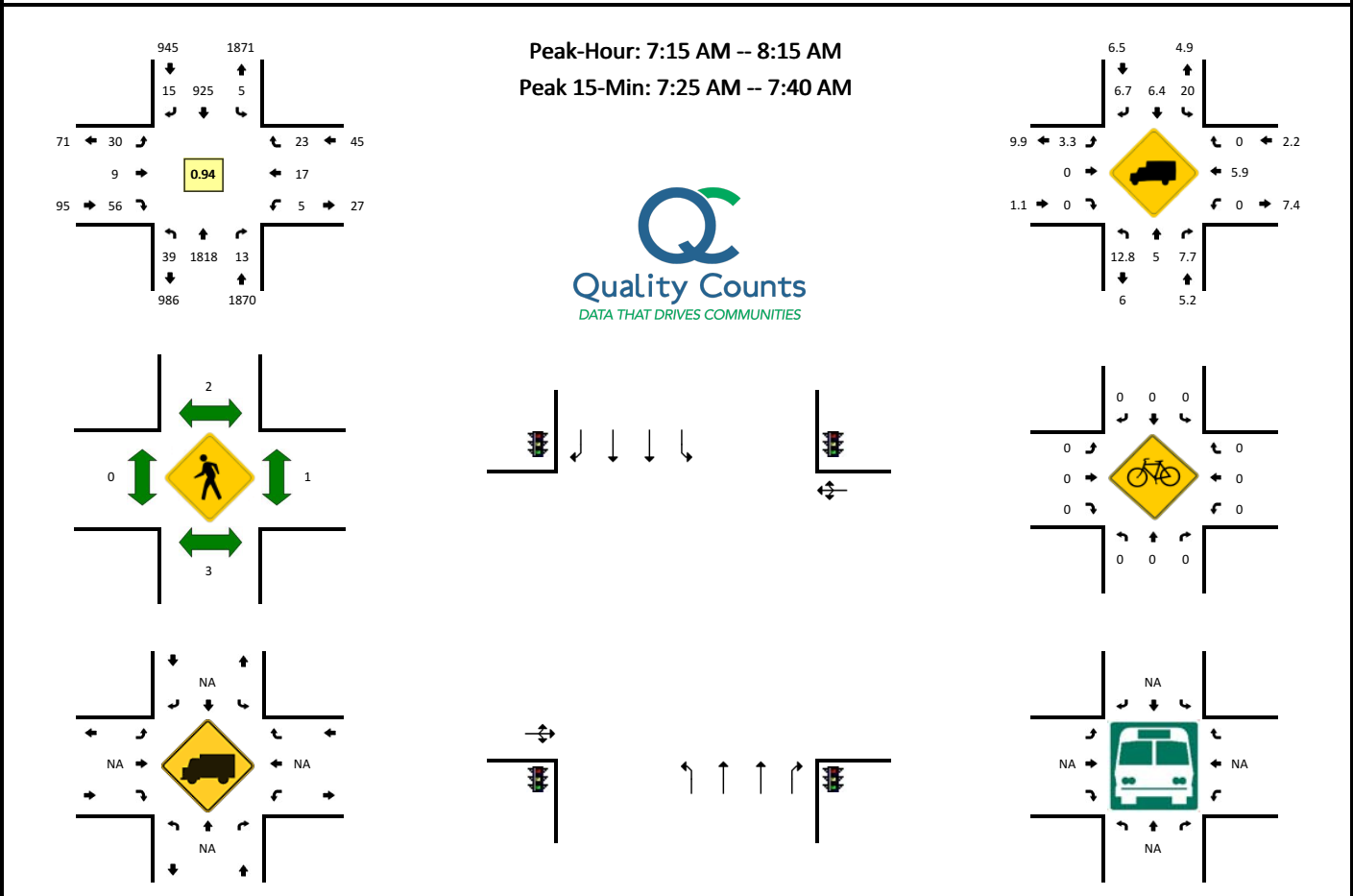


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Harrison St (Eastbound)				SE Harrison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	8	107	5	0	18	120	2	0	0	25	3	0	8	10	10	0	316	
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	0	52	0	0	0	12	8	0	0	4	0	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

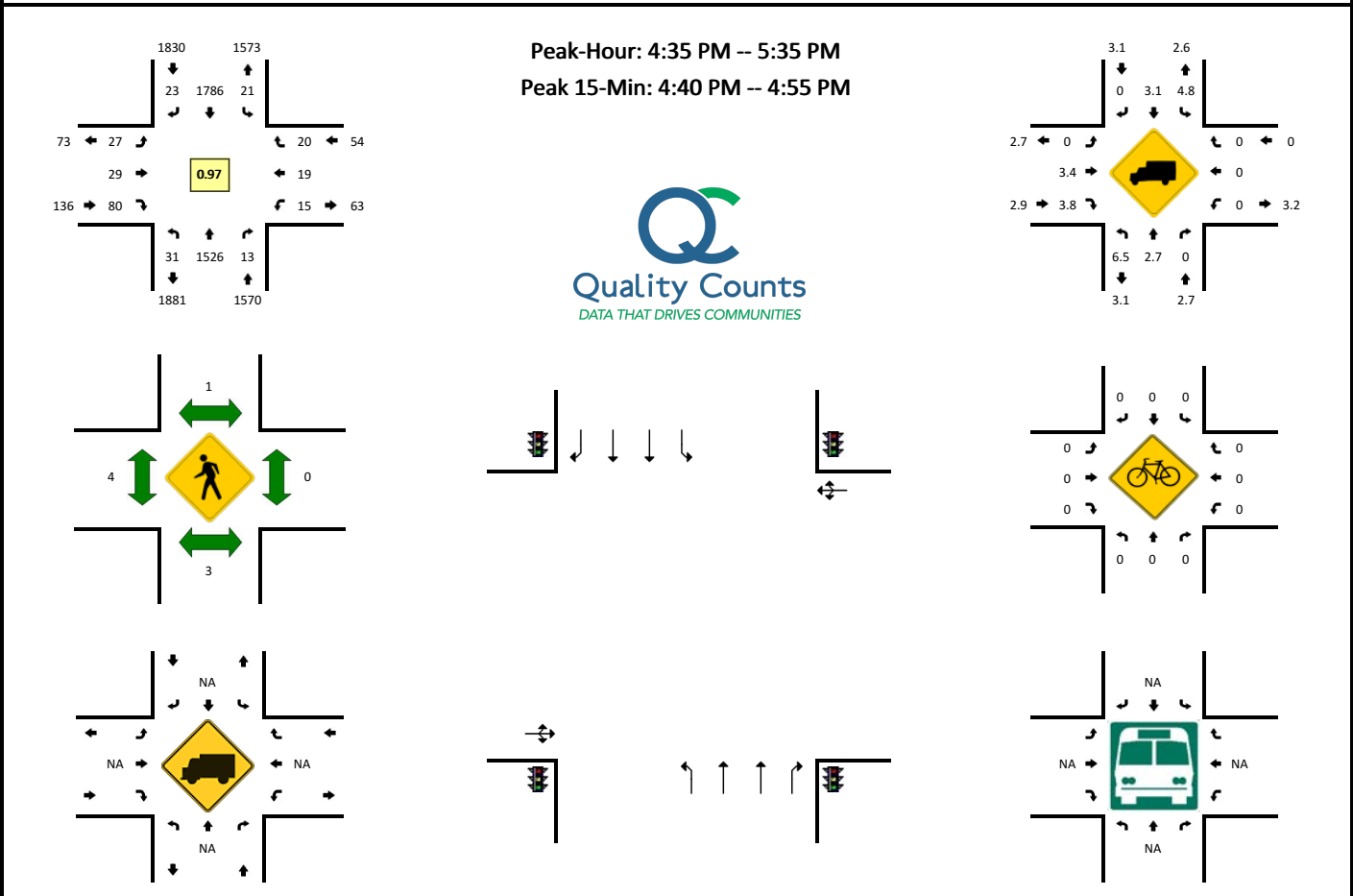


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Monroe St (Eastbound)				SE Monroe St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	158	0	0	0	72	1	0	4	2	1	0	0	1	2	0	243	
7:05 AM	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

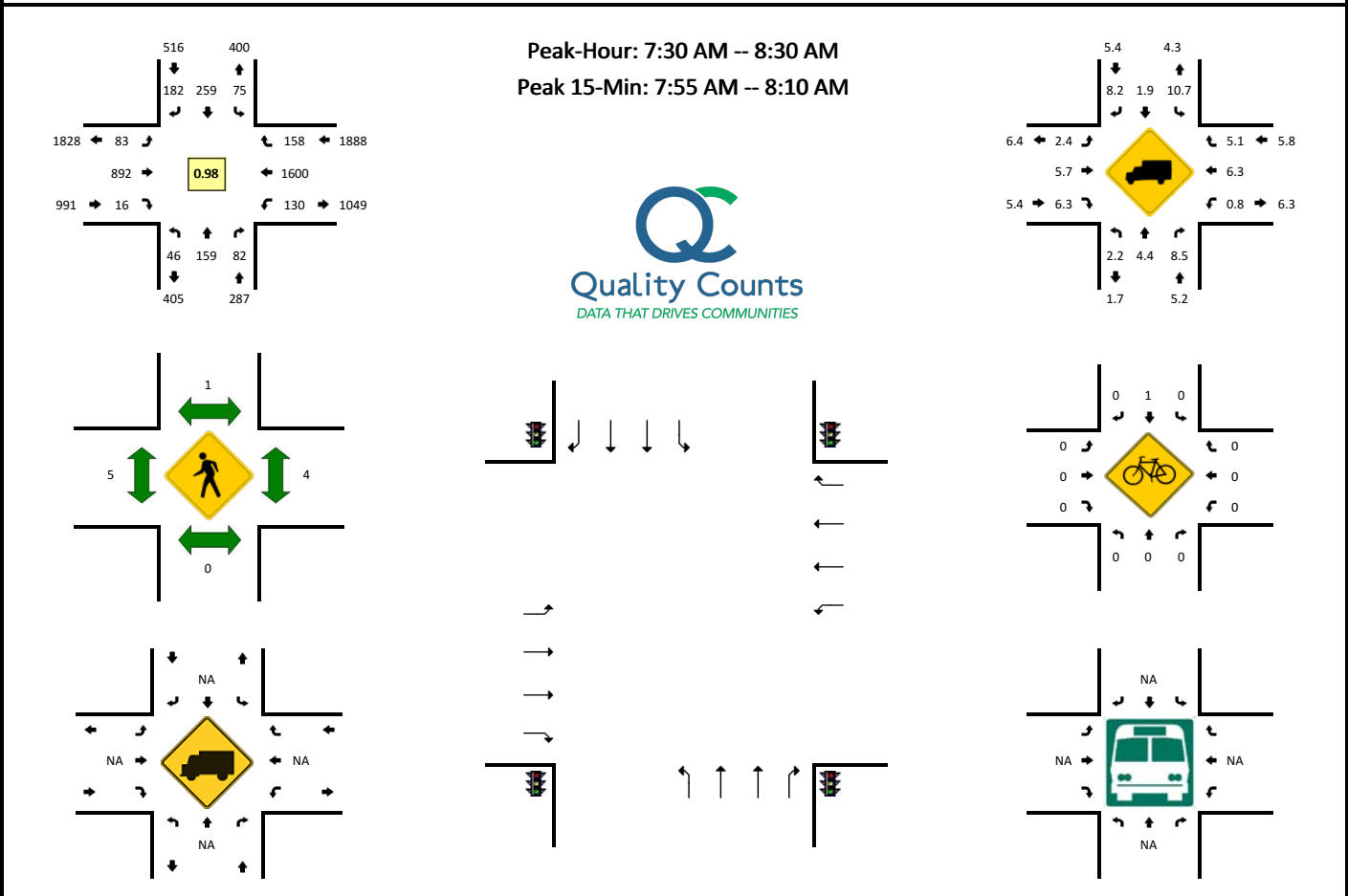


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Monroe St (Eastbound)				SE Monroe St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	111	1	0	0	134	3	0	4	4	6	0	0	3	1	0	269	
4:05 PM	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

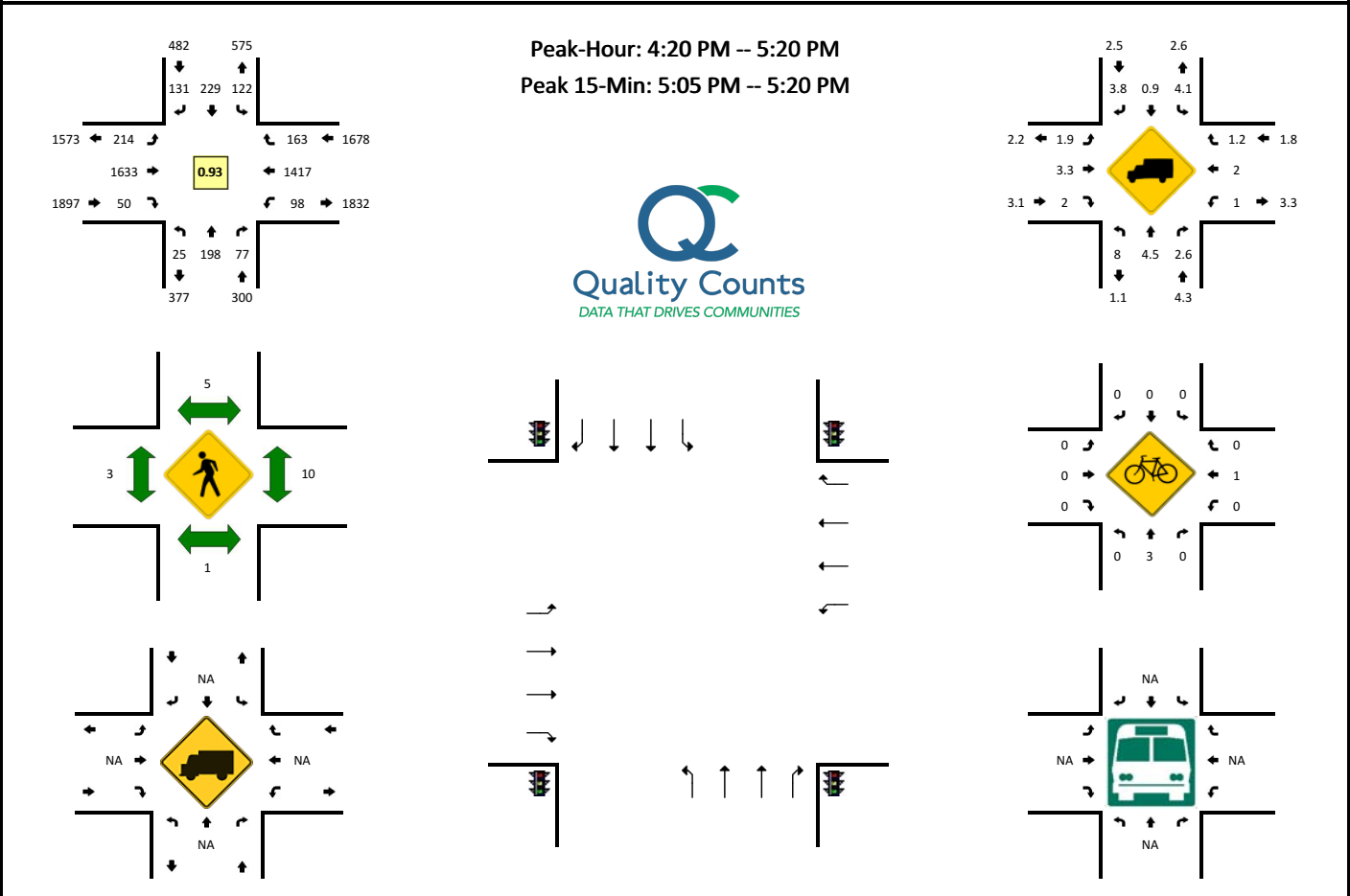


5-Min Count Period Beginning At	SE Oak St (Northbound)				SE Oak St (Southbound)				Milwaukie Expy (Eastbound)				Milwaukie Expy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	9	3	0	6	4	15	0	2	70	0	0	0	142	11	0	266	
7:05 AM	10	6	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

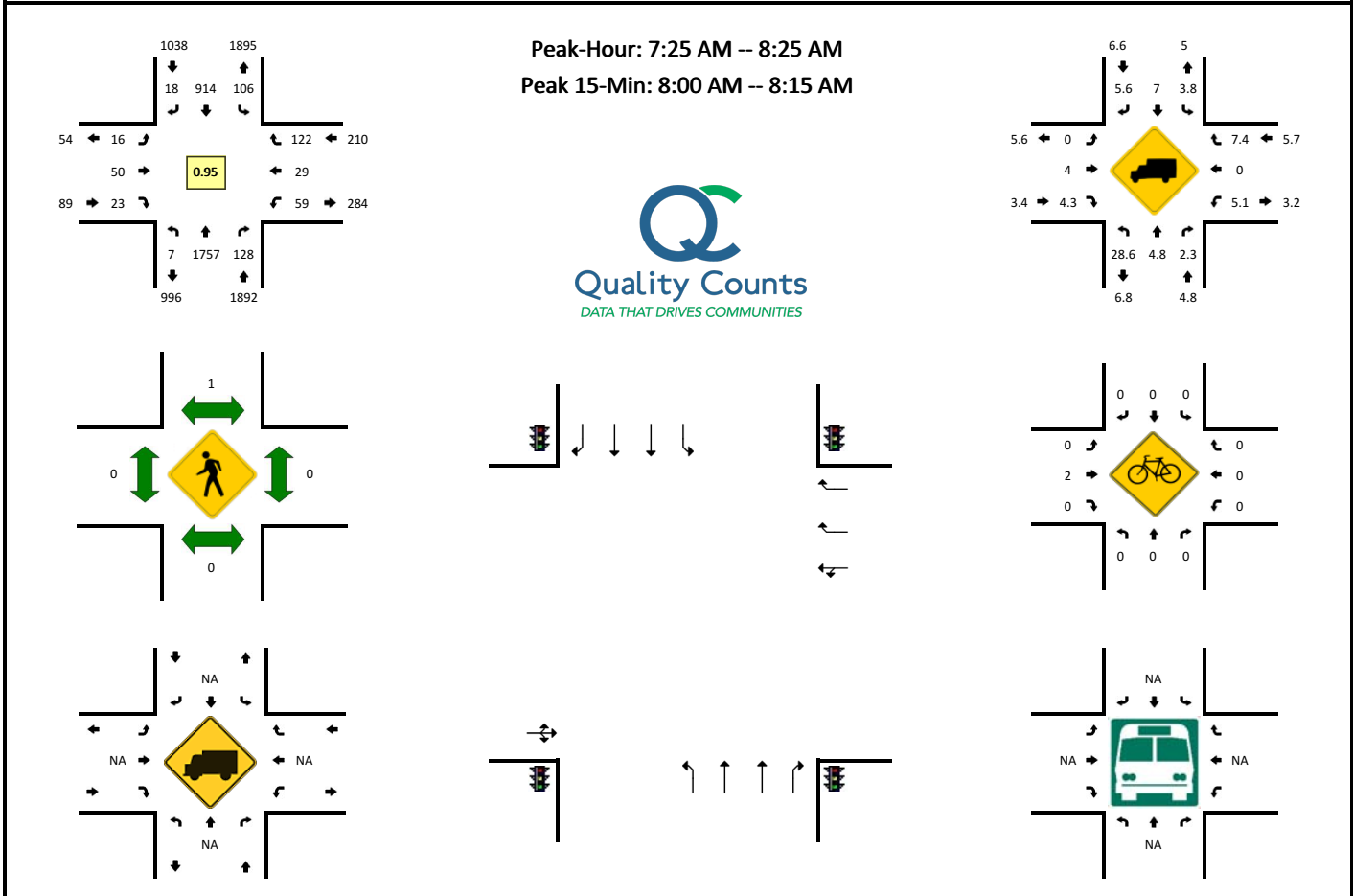


5-Min Count Period Beginning At	SE Oak St (Northbound)				SE Oak St (Southbound)				Milwaukie Expy (Eastbound)				Milwaukie Expy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	20	9	0	13	12	8	0	17	107	4	0	15	108	15	0	328	
4:05 PM	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

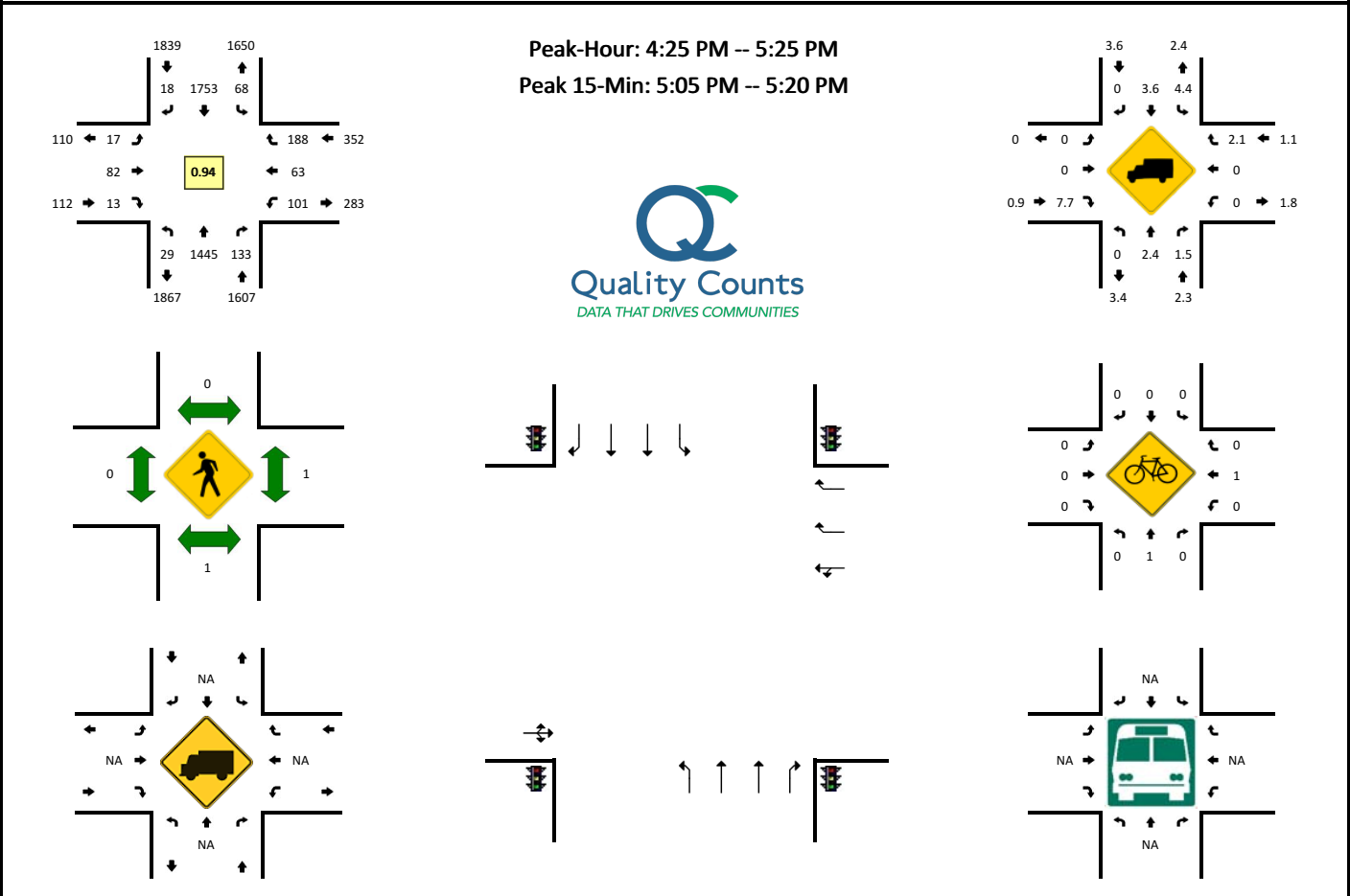


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Edison St (Eastbound)				SE Edison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	168	7	0	9	65	0	0	0	2	2	0	2	5	2	0	262	
7:05 AM	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

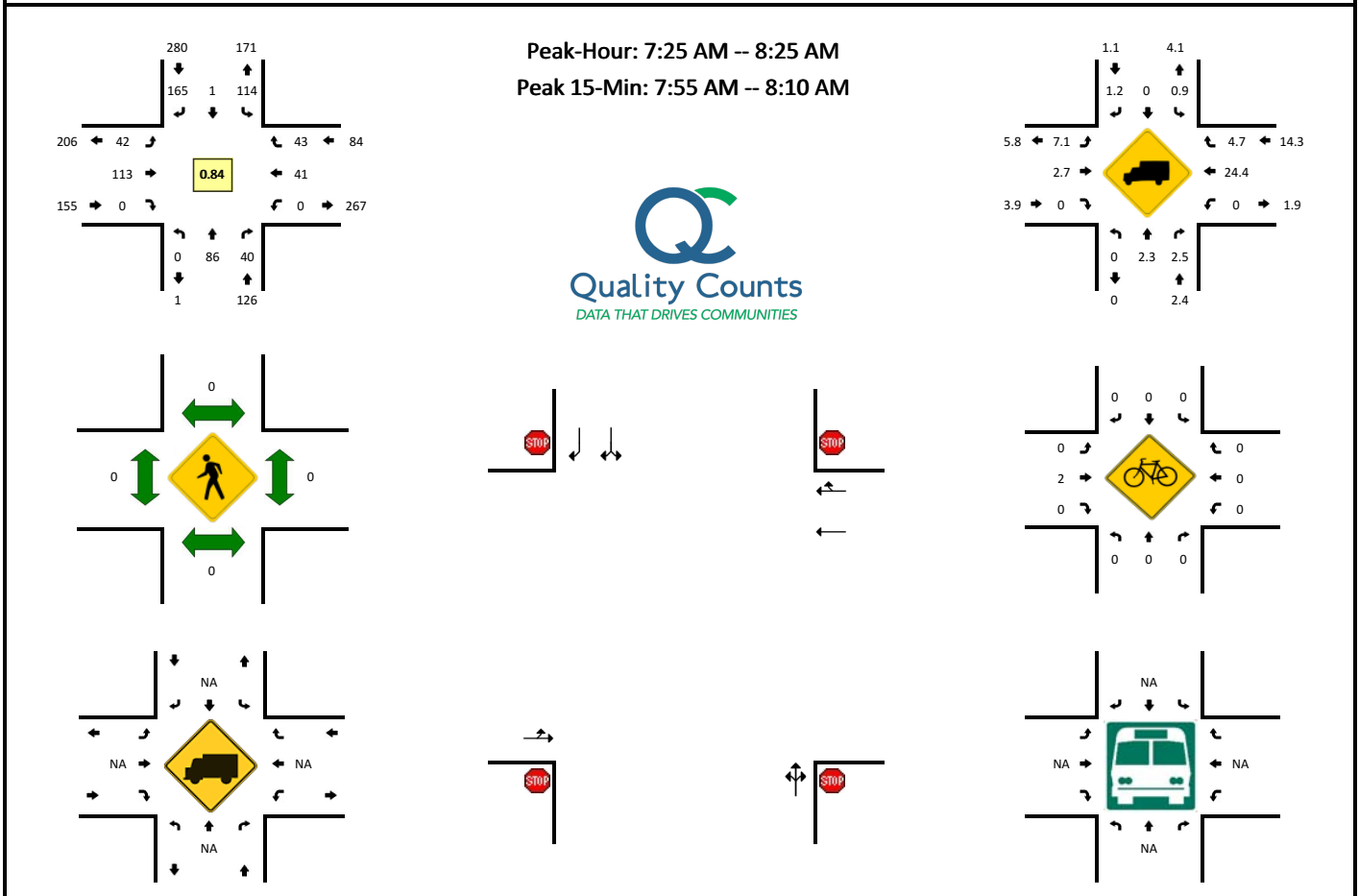


5-Min Count Period Beginning At	Milwaukie Expy (Northbound)				Milwaukie Expy (Southbound)				SE Edison St (Eastbound)				SE Edison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	124	12	0	10	143	1	0	0	7	0	0	5	3	19	0	326	
4:05 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		4	44	0		0	0	0		0	0	4		84	
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: SE 37th Ave -- SE International Way
CITY/STATE: Clackamas, OR

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

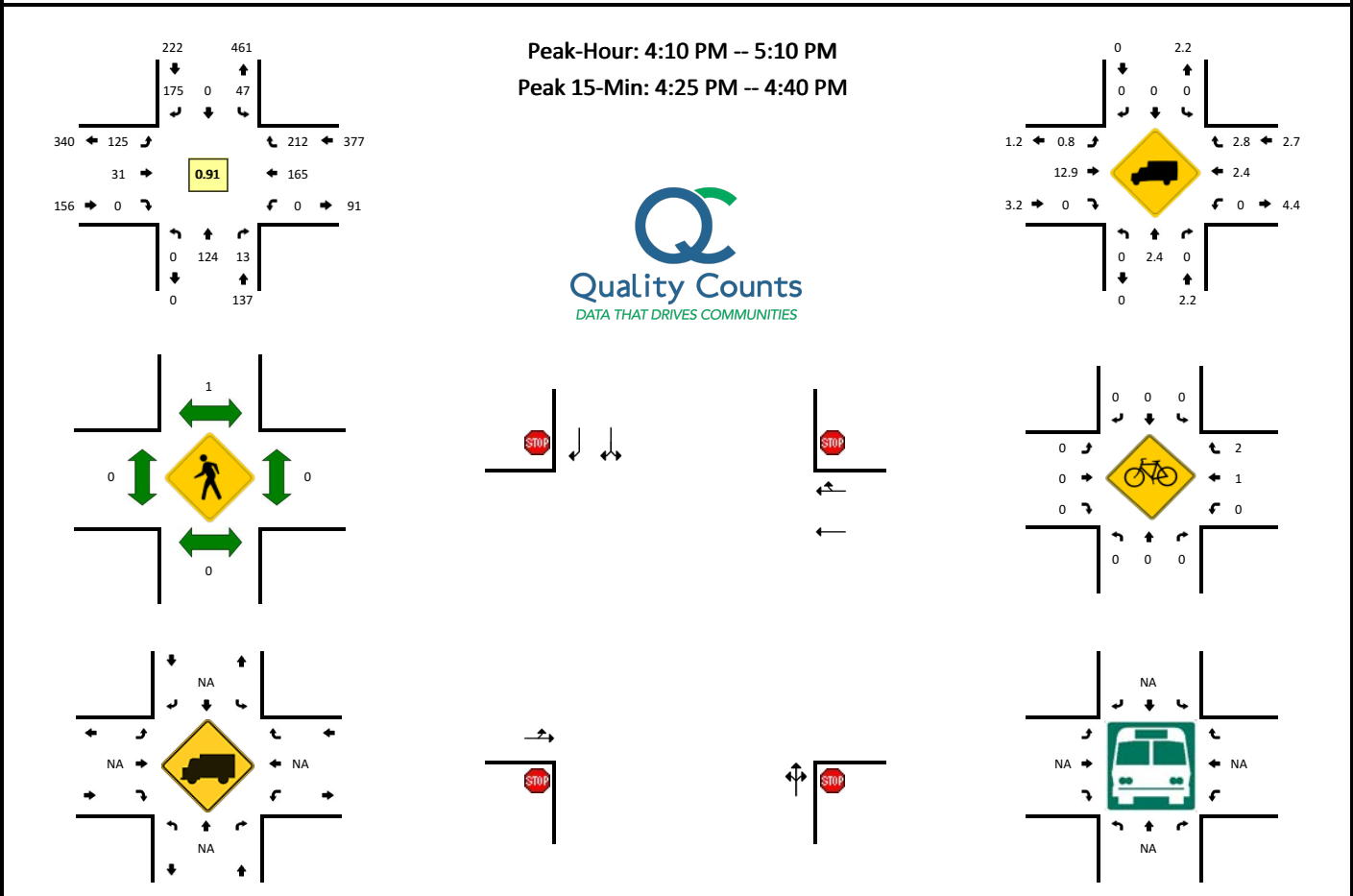


5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE International Way (Eastbound)				SE International Way (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	2	3	0	8	0	9	0	2	9	0	0	0	1	0	0	0	34	
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	0	0	4	0	0	0	20	4	0	0	28	
Pedestrians	0	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	1	0	0	0	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

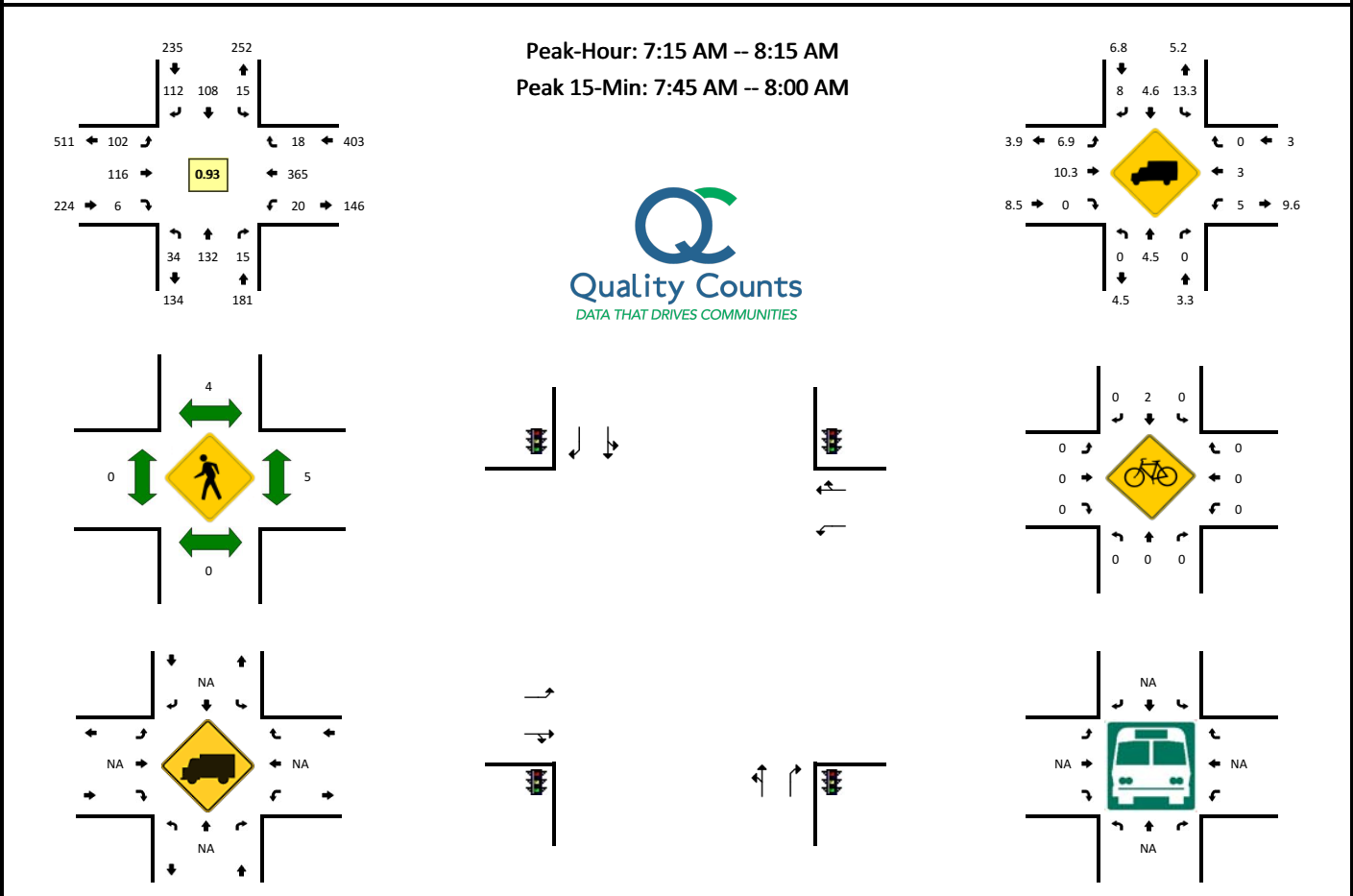


5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE International Way (Eastbound)				SE International Way (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	10	2	0	2	0	13	0	11	6	0	0	0	18	14	0	76	
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

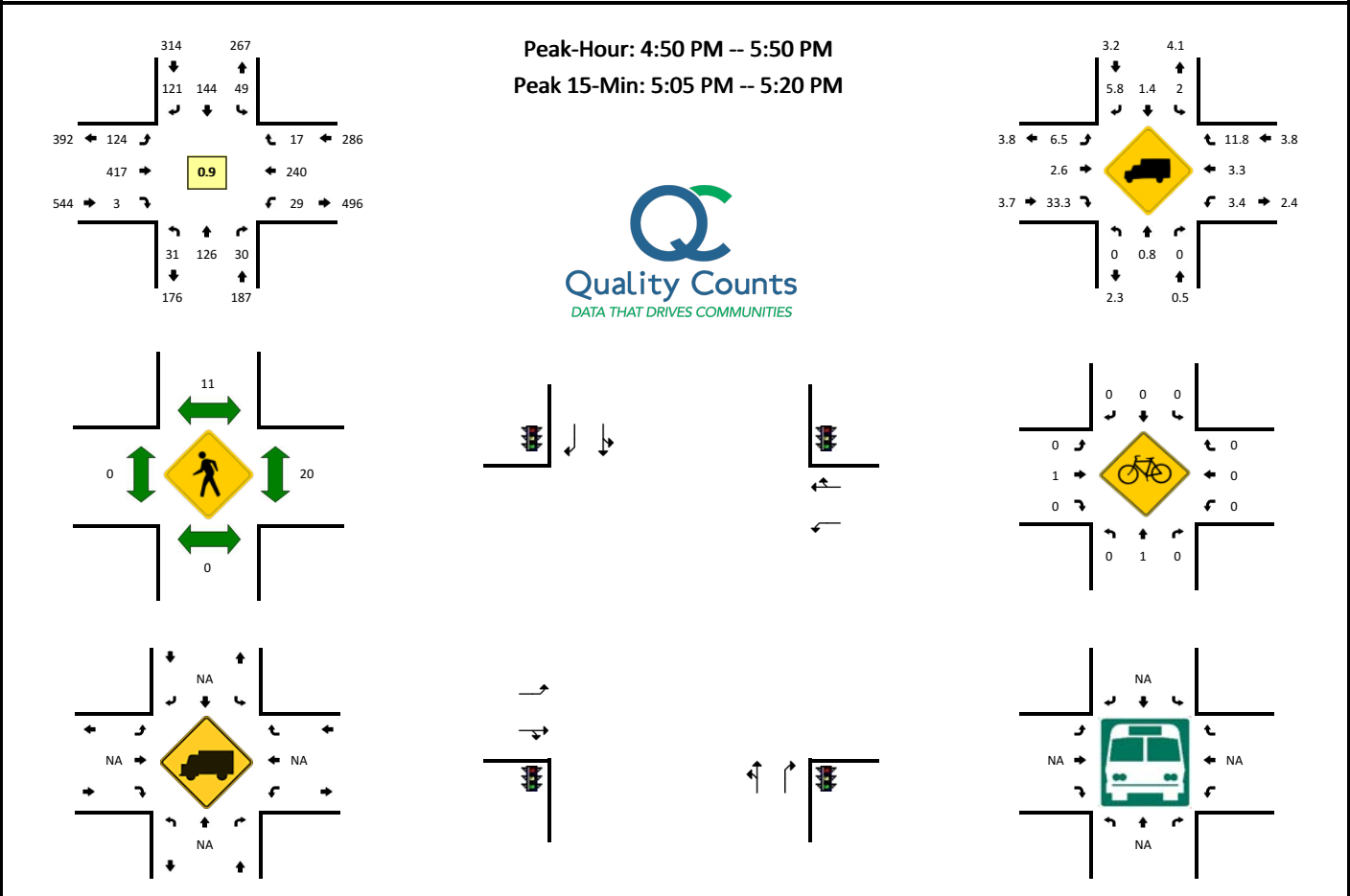


5-Min Count Period Beginning At	SE 32nd Ave (Northbound)				SE 32nd Ave (Southbound)				SE Harrison St (Eastbound)				SE Harrison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	6	1	0	2	4	9	0	6	4	0	0	1	28	1	0	66	
7:05 AM	8	6	2	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

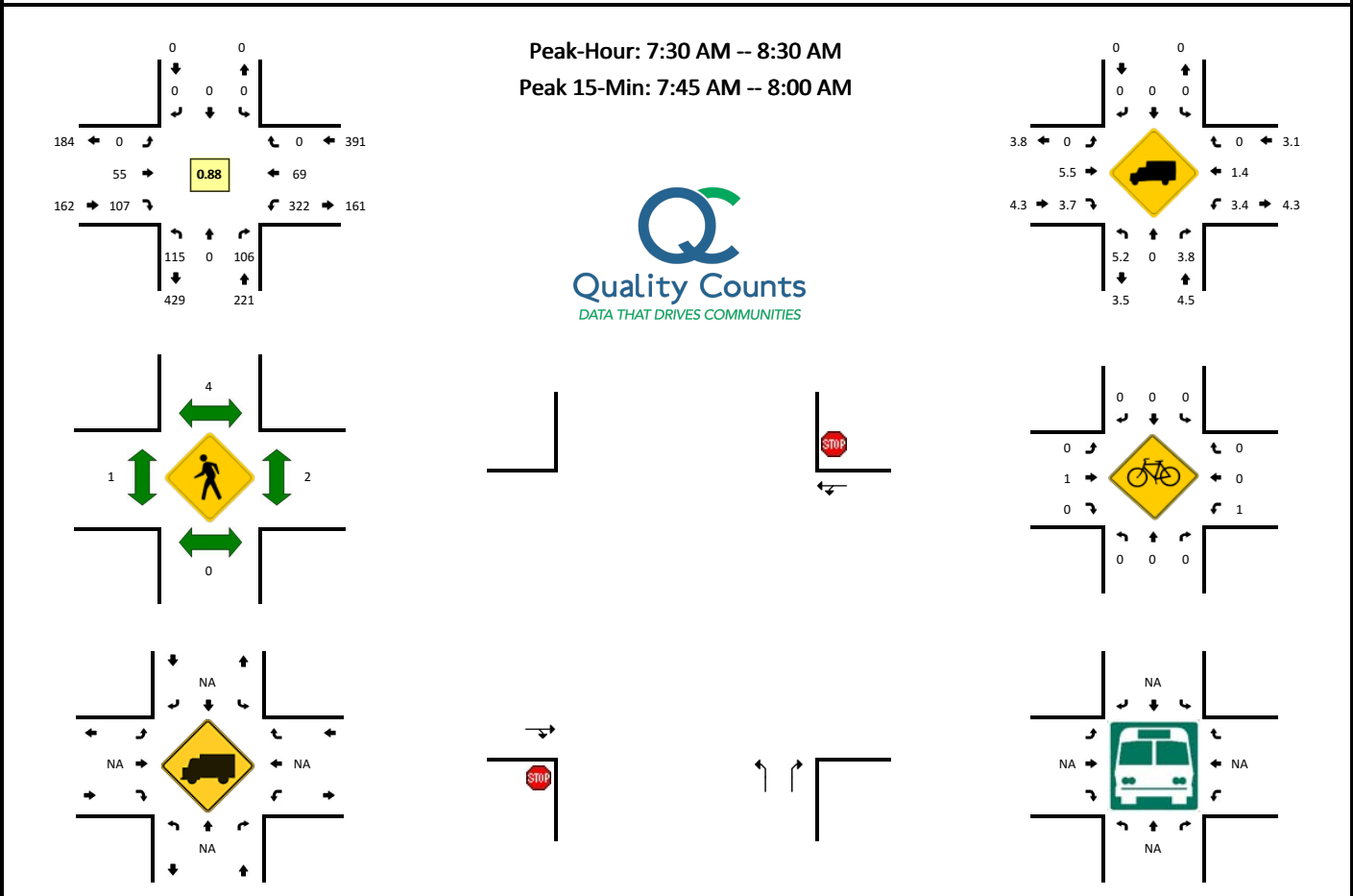


5-Min Count Period Beginning At	SE 32nd Ave (Northbound)				SE 32nd Ave (Southbound)				SE Harrison St (Eastbound)				SE Harrison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	5	2	0	3	12	11	0	11	25	0	0	0	10	2	0	82	
4:05 PM	3	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	0	4	0	0	0	8	12	0	0	0	4	0	0	32	
Pedestrians		0				12				0				28			40	
Bicycles	0	1	0	0	0	0	0	0	0	1	1	0	0	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

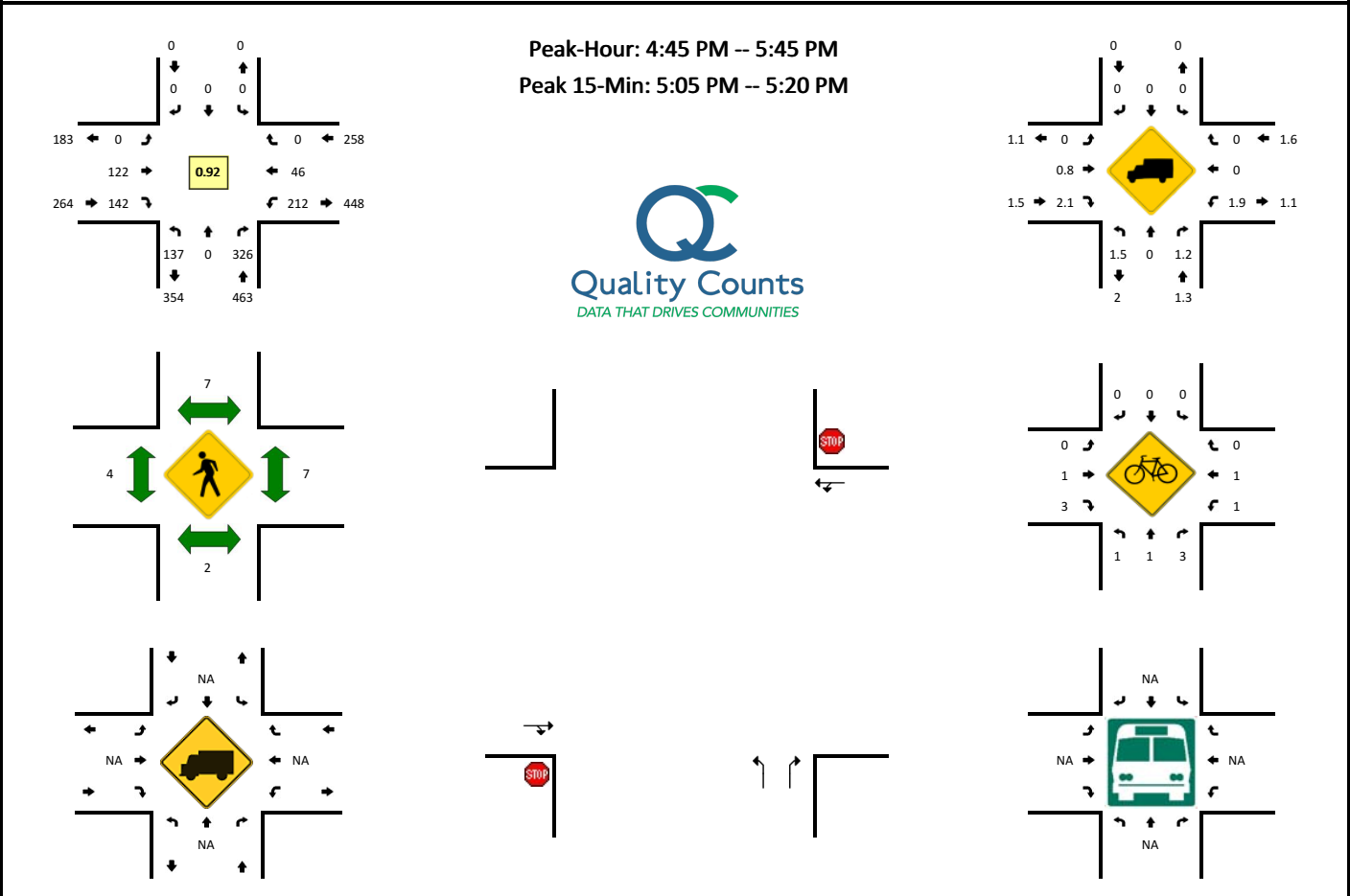


5-Min Count Period Beginning At	SE Oak St (Northbound)				SE Oak St (Southbound)				SE Railroad Ave (Eastbound)				SE Railroad Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	7	0	5	0	0	0	0	0	0	0	6	0	11	6	0	0	35	
7:05 AM	8	0	3	0	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

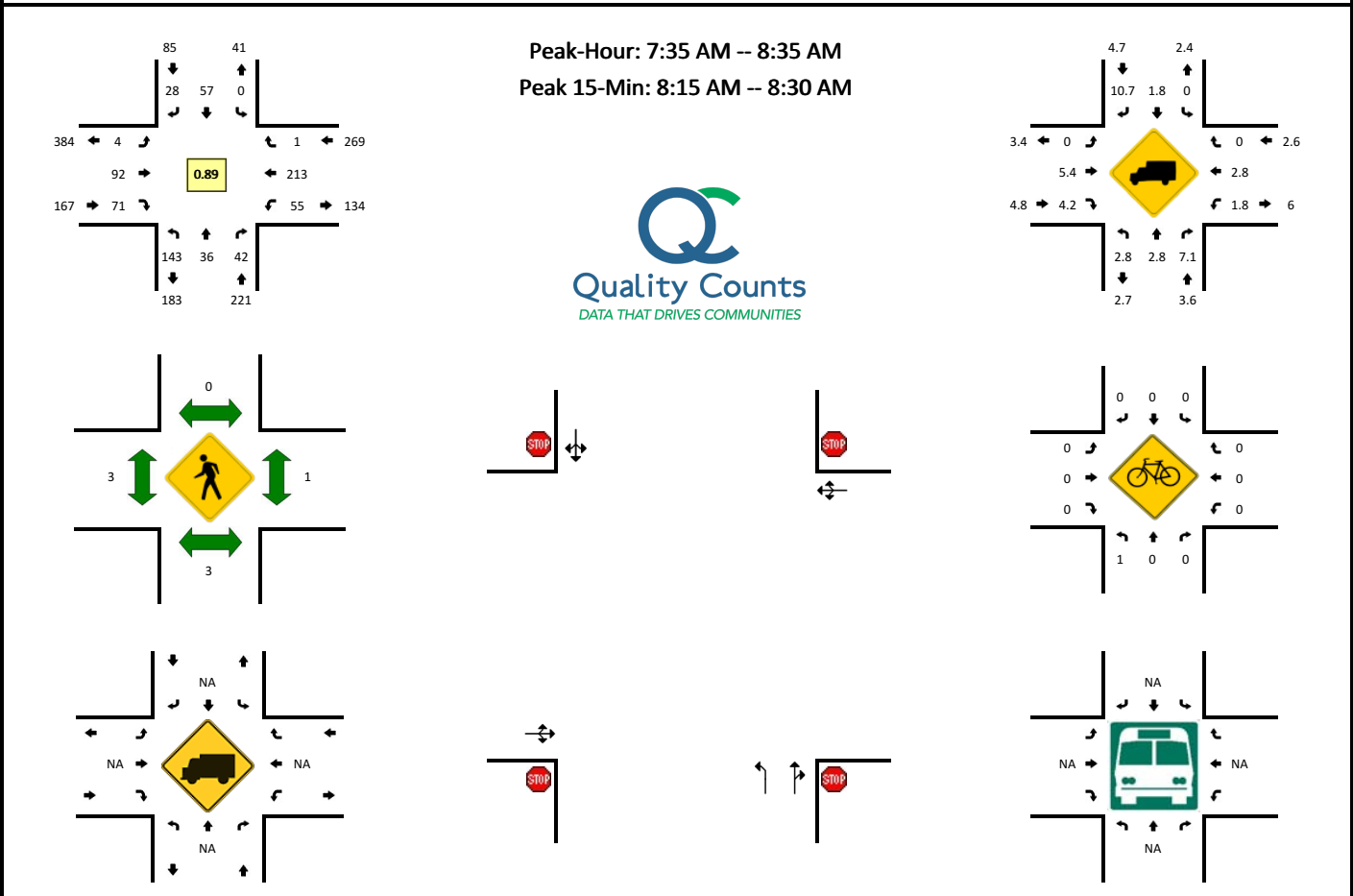


5-Min Count Period Beginning At	SE Oak St (Northbound)				SE Oak St (Southbound)				SE Railroad Ave (Eastbound)				SE Railroad Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	0	17	0	0	0	0	0	0	9	8	0	9	2	0	0	52	
4:05 PM	12	0	20	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

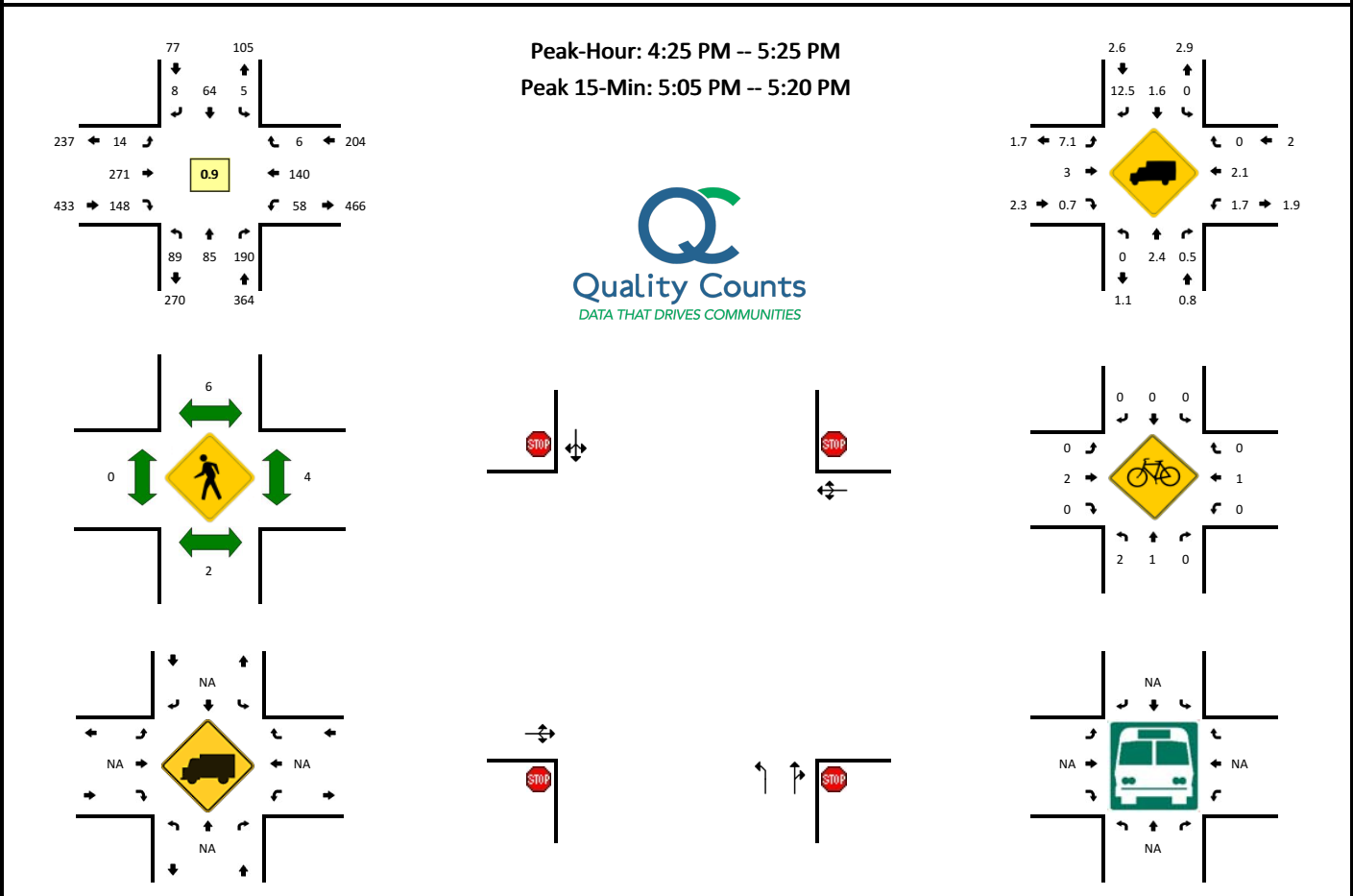


5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE Monroe St (Eastbound)				SE Monroe St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	1	1	0	0	6	1	0	1	1	1	0	5	9	0	0	31	
7:05 AM	13	1	3	0	0	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	8		0	4	0		0	8	0		36	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																	0	

Comments:

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

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



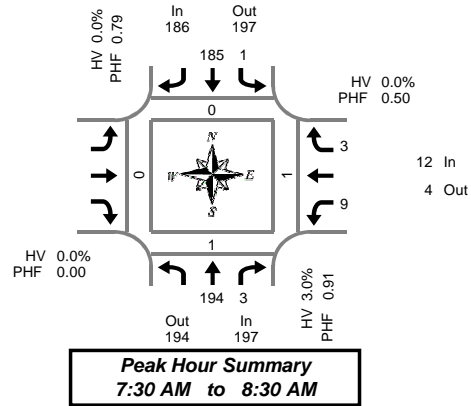
5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE Monroe St (Eastbound)				SE Monroe St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	2	16	0	0	1	1	0	0	11	15	0	1	6	0	0	57	
4:05 PM	3	7	16	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	0	1	0	0	28	0	0	0	0
7:05 AM	8	0	1	0	9	0	0	0	0	0	0	0	17	0	0	0	0
7:10 AM	15	0	0	1	14	0	0	0	0	0	0	0	30	0	0	0	0
7:15 AM	15	0	0	0	13	0	0	0	1	0	0	0	29	0	0	0	0
7:20 AM	15	0	0	0	16	0	0	0	0	3	0	0	34	0	0	0	0
7:25 AM	14	0	0	0	10	0	0	0	1	0	0	0	25	0	0	1	0
7:30 AM	15	0	0	0	17	1	0	0	3	2	0	0	37	0	0	1	0
7:35 AM	16	0	0	0	15	0	0	0	0	0	0	0	31	0	0	0	0
7:40 AM	21	0	0	0	19	0	0	0	1	0	0	0	41	0	0	0	0
7:45 AM	17	0	0	0	18	0	0	0	1	1	0	0	37	0	0	0	0
7:50 AM	12	1	0	0	21	0	0	0	0	0	0	0	34	0	0	0	0
7:55 AM	12	1	0	0	20	0	0	0	2	0	0	0	35	0	0	0	0
8:00 AM	24	0	0	0	14	0	0	0	0	0	0	0	38	0	1	0	0
8:05 AM	11	0	0	0	12	0	0	0	0	0	0	0	23	0	0	0	0
8:10 AM	18	0	0	0	7	0	0	0	2	0	0	0	27	0	0	0	0
8:15 AM	13	0	0	0	15	0	0	0	0	0	0	0	28	0	0	0	0
8:20 AM	21	0	0	1	13	0	0	0	0	0	0	0	35	0	0	0	0
8:25 AM	14	1	0	0	14	1	0	0	0	0	0	0	29	0	0	0	0
8:30 AM	11	1	0	0	13	0	0	0	0	0	0	0	25	0	0	0	0
8:35 AM	12	0	0	0	14	1	0	0	2	0	0	0	28	0	0	0	0
8:40 AM	12	0	0	1	13	0	0	0	0	0	0	0	26	0	1	1	0
8:45 AM	11	0	0	0	10	0	0	0	1	0	0	0	22	0	0	0	0
8:50 AM	11	0	0	0	18	0	0	0	0	0	0	0	29	0	0	0	0
8:55 AM	13	0	0	0	15	1	0	0	0	0	0	0	28	0	0	0	0
Total Survey	345	4	1	3	343	4	0	0	14	7	0	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	0	0	75	0	0	0	0
7:15 AM	44	0	0	0	39	0	0	0	2	3	0	0	88	0	0	1	0
7:30 AM	52	0	0	0	51	1	0	0	4	2	0	0	109	0	0	1	0
7:45 AM	41	2	0	0	59	0	0	0	3	1	0	0	106	0	0	0	0
8:00 AM	53	0	0	0	33	0	0	0	2	0	0	0	88	0	1	0	0
8:15 AM	48	1	0	1	42	1	0	0	0	0	0	0	92	0	0	0	0
8:30 AM	35	1	0	1	40	1	0	0	2	0	0	0	79	0	1	1	0
8:45 AM	35	0	0	0	43	1	0	0	1	0	0	0	79	0	0	0	0
Total Survey	345	4	1	3	343	4	0	0	14	7	0	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	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West	
Volume	197	194	391	0	186	197	383	2	0	0	0	0	12	4	16	0	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	NA	0.00	0.56	0.38	0.50	0.88	

Rolling Hour Summary

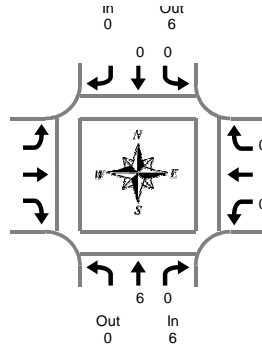
7:00 AM to 9:00 AM

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	0	9	7	0	0	378	0	0	2	0
7:15 AM	190	2	0	0	182	1	0	0	11	6	0	0	391	0	1	2	0
7:30 AM	194	3	0	1	185	2	0	0	9	3	0	0	395	0	1	1	0
7:45 AM	177	4	0	2	174	2	0	0	7	1	0	0	365	0	2	1	0
8:00 AM	171	2	0	2	158	3	0	0	5	0	0	0	338	0	2	1	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



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

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	
7:00 AM	1	0	1	0	0	0			0	0	0	0	1
7:05 AM	0	0	0	0	0	0			0	0	0	0	0
7:10 AM	1	0	1	0	0	0			0	0	0	0	1
7:15 AM	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
7:25 AM	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
7:35 AM	0	0	0	0	0	0			0	0	0	0	0
7:40 AM	3	0	3	0	0	0			0	0	0	0	3
7:45 AM	1	0	1	0	0	0			0	0	0	0	1
7:50 AM	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
8:00 AM	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
8:10 AM	1	0	1	0	0	0			0	0	0	0	1
8:15 AM	1	0	1	0	0	0			0	0	0	0	1
8:20 AM	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
8:30 AM	0	0	0	0	1	1			0	0	0	0	1
8:35 AM	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
8:45 AM	0	0	0	0	1	1			0	0	0	0	1
8:50 AM	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
Total Survey	8	0	8	0	2	2			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	
7:00 AM	2	0	2	0	0	0			0	0	0	0	2
7:15 AM	0	0	0	0	0	0			0	0	0	0	0
7:30 AM	3	0	3	0	0	0			0	0	0	0	3
7:45 AM	1	0	1	0	0	0			0	0	0	0	1
8:00 AM	1	0	1	0	0	0			0	0	0	0	1
8:15 AM	1	0	1	0	0	0			0	0	0	0	1
8:30 AM	0	0	0	0	1	1			0	0	0	0	1
8:45 AM	0	0	0	0	1	1			0	0	0	0	1
Total Survey	8	0	8	0	2	2			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	
Volume	6	0	6	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	0.38

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	
7:00 AM	6	0	6	0	0	0			0	0	0	0	6
7:15 AM	5	0	5	0	0	0			0	0	0	0	5
7:30 AM	6	0	6	0	0	0			0	0	0	0	6
7:45 AM	3	0	3	0	1	1			0	0	0	0	4
8:00 AM	2	0	2	0	2	2			0	0	0	0	4

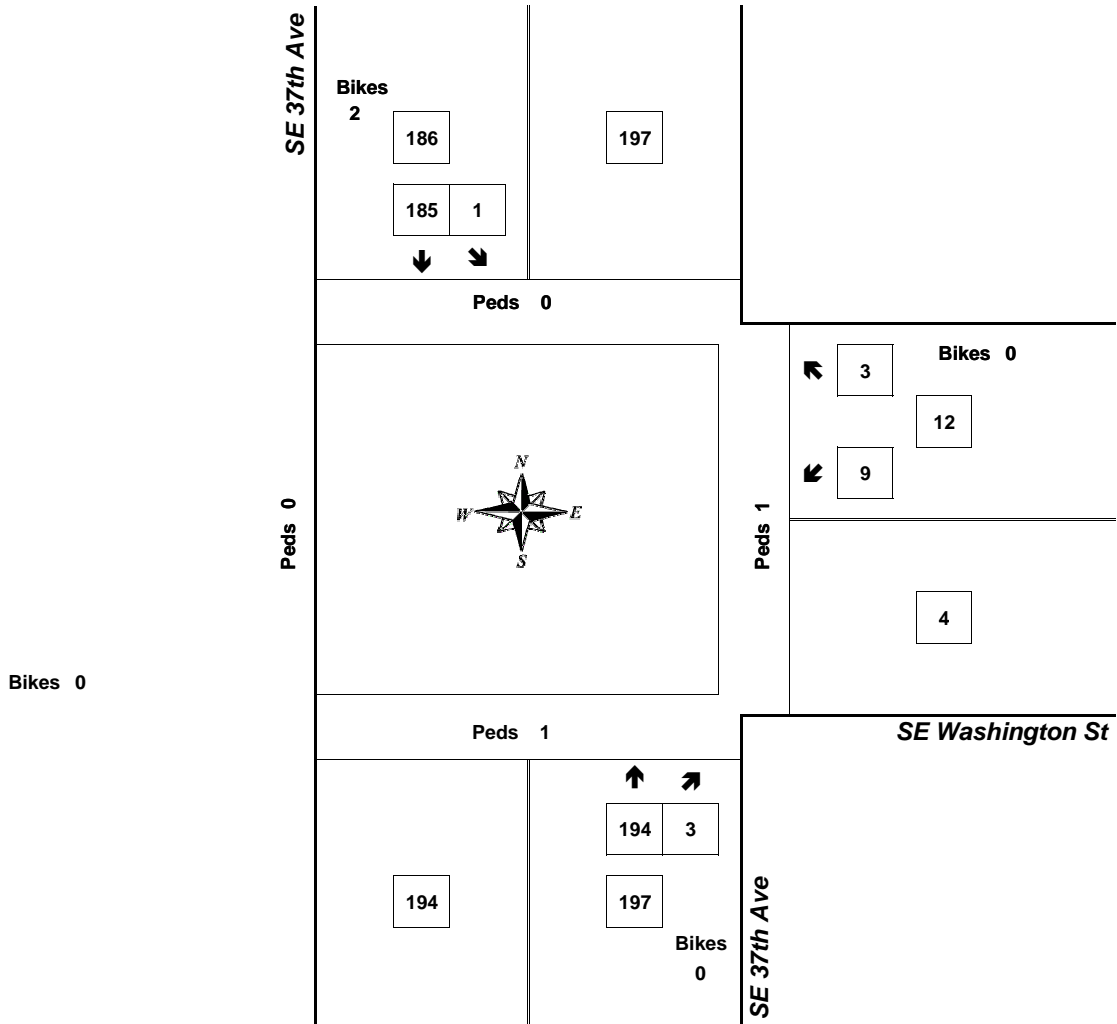
Peak Hour Summary



Clay Carney
(503) 833-2740

SE 37th Ave & SE Washington St

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



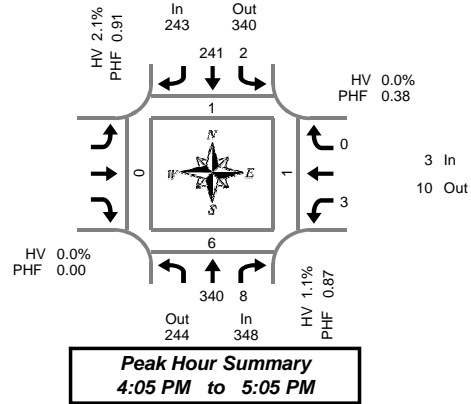
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.50	0.0%	12
NB	0.91	3.0%	197
SB	0.79	0.0%	186
Intersection	0.88	1.5%	395

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	0	0	0	0	0	0	0
4:05 PM	39	1	0	1	21	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	39	2	0	0	25	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	18	1	0	0	15	0	0	0	1	0	0	0	0	0	1	0	0
4:20 PM	28	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	27	0	0	0	23	0	0	0	0	0	0	0	0	0	2	1	0
4:30 PM	26	1	0	0	27	0	0	0	0	0	0	0	0	0	1	0	0
4:35 PM	33	0	0	0	11	1	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	18	2	0	0	18	1	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	27	1	0	0	22	0	0	0	0	0	0	0	0	0	1	0	0
4:50 PM	27	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	28	0	0	1	25	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	30	0	0	0	19	0	0	1	0	0	0	0	0	0	2	0	0
5:05 PM	36	0	0	1	15	0	0	0	1	0	0	0	0	0	0	0	0
5:10 PM	24	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	26	0	0	0	23	0	0	1	0	0	0	0	0	0	2	0	0
5:20 PM	20	0	0	0	13	0	0	1	0	0	0	0	0	0	2	2	0
5:25 PM	24	0	0	1	24	0	0	3	0	0	0	0	0	0	0	0	0
5:30 PM	33	0	2	0	14	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	21	0	0	0	21	0	0	1	0	0	0	0	0	0	0	0	0
5:40 PM	19	1	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	12	0	0	0	20	0	0	1	0	0	0	0	0	0	2	0	0
5:50 PM	17	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	18	1	0	1	16	0	0	0	0	0	0	0	0	0	1	0	0
Total Survey	616	10	2	5	463	2	0	10	1	0	1,105	1	13	3	0	0	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	0	1	0	0	0	0	169	0	0	0
4:15 PM	73	1	0	0	55	0	0	0	1	0	0	0	0	130	0	3	1
4:30 PM	77	3	0	0	56	2	0	0	0	0	0	0	0	136	1	0	0
4:45 PM	82	1	0	1	65	0	0	0	0	0	0	0	0	149	0	1	0
5:00 PM	90	0	0	1	57	0	0	0	1	1	0	0	0	150	0	2	0
5:15 PM	70	0	0	1	60	0	0	5	0	0	0	0	0	136	0	4	2
5:30 PM	73	1	2	0	56	0	0	0	1	0	0	0	0	131	0	0	0
5:45 PM	47	1	0	1	54	0	0	0	1	0	0	0	0	104	0	3	0
Total Survey	616	10	2	5	463	2	0	10	1	0	1,105	1	13	3	0	0	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
%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	1.5%		
PHF	0.89	0.50	0.87	0.50	0.90	0.91	NA	0.00	0.38	0.00	0.91		

Rolling Hour Summary

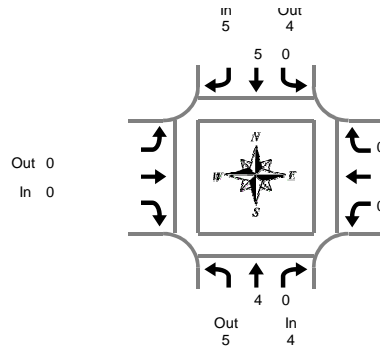
4:00 PM to 6:00 PM

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	0	584	1	4	1	0	
4:15 PM	322	5	0	2	233	2	0	2	1	0	0	565	1	6	1	0	
4:30 PM	319	4	0	3	238	2	0	6	1	0	0	571	1	7	2	0	
4:45 PM	315	2	2	3	238	0	0	7	1	0	0	566	0	7	2	0	
5:00 PM	280	2	2	3	227	0	0	8	1	0	0	521	0	9	2	0	

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



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

SE 37th Ave & SE Washington St

Tuesday, April 09, 2019

4:00 PM to 6:00 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	Total	L		R
4:00 PM	0	0	0	0	0	1	1					0	0	1
4:05 PM	0	0	0	0	0	0	0					0	0	0
4:10 PM	0	0	0	0	0	0	0					0	0	0
4:15 PM	0	0	0	0	0	0	0					0	0	0
4:20 PM	1	0	1	0	2	2	2					0	0	3
4:25 PM	1	0	1	0	0	0	0					0	0	1
4:30 PM	1	0	1	0	1	1	1					0	0	2
4:35 PM	0	0	0	0	1	1	1					0	0	1
4:40 PM	0	0	0	0	0	0	0					0	0	0
4:45 PM	0	0	0	0	0	0	0					0	0	0
4:50 PM	0	0	0	0	0	0	0					0	0	0
4:55 PM	0	0	0	0	0	0	0					0	0	0
5:00 PM	1	0	1	0	1	1	1					0	0	2
5:05 PM	1	0	1	0	0	0	0					1	1	2
5:10 PM	0	0	0	0	0	0	0					0	0	0
5:15 PM	0	0	0	0	0	0	0					0	0	0
5:20 PM	0	0	0	0	0	0	0					0	0	0
5:25 PM	1	0	1	0	0	0	0					0	0	1
5:30 PM	2	0	2	0	0	0	0					0	0	2
5:35 PM	0	0	0	0	0	0	0					0	0	0
5:40 PM	0	0	0	0	0	0	0					0	0	0
5:45 PM	1	0	1	0	0	0	0					0	0	1
5:50 PM	1	0	1	0	1	1	1					0	0	2
5:55 PM	0	0	0	0	0	0	0					0	0	0
Total Survey	10	0	10	0	7	7	7					1	1	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	Total	L		R
4:00 PM	0	0	0	0	1	1	1					0	0	1
4:15 PM	2	0	2	0	2	2	2					0	0	4
4:30 PM	1	0	1	0	2	2	2					0	0	3
4:45 PM	0	0	0	0	0	0	0					0	0	0
5:00 PM	2	0	2	0	1	1	1					1	1	4
5:15 PM	1	0	1	0	0	0	0					0	0	1
5:30 PM	2	0	2	0	0	0	0					0	0	2
5:45 PM	2	0	2	0	1	1	1					0	0	3
Total Survey	10	0	10	0	7	7	7					1	1	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	Total	L		R
Volume	4	0	4	0	5	5				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	0.38

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	Total	L		R
4:00 PM	3	0	3	0	5	5	5					0	0	8
4:15 PM	5	0	5	0	5	5	5					1	1	11
4:30 PM	4	0	4	0	3	3	3					1	1	8
4:45 PM	5	0	5	0	1	1	1					1	1	7
5:00 PM	7	0	7	0	2	2	2					1	1	10

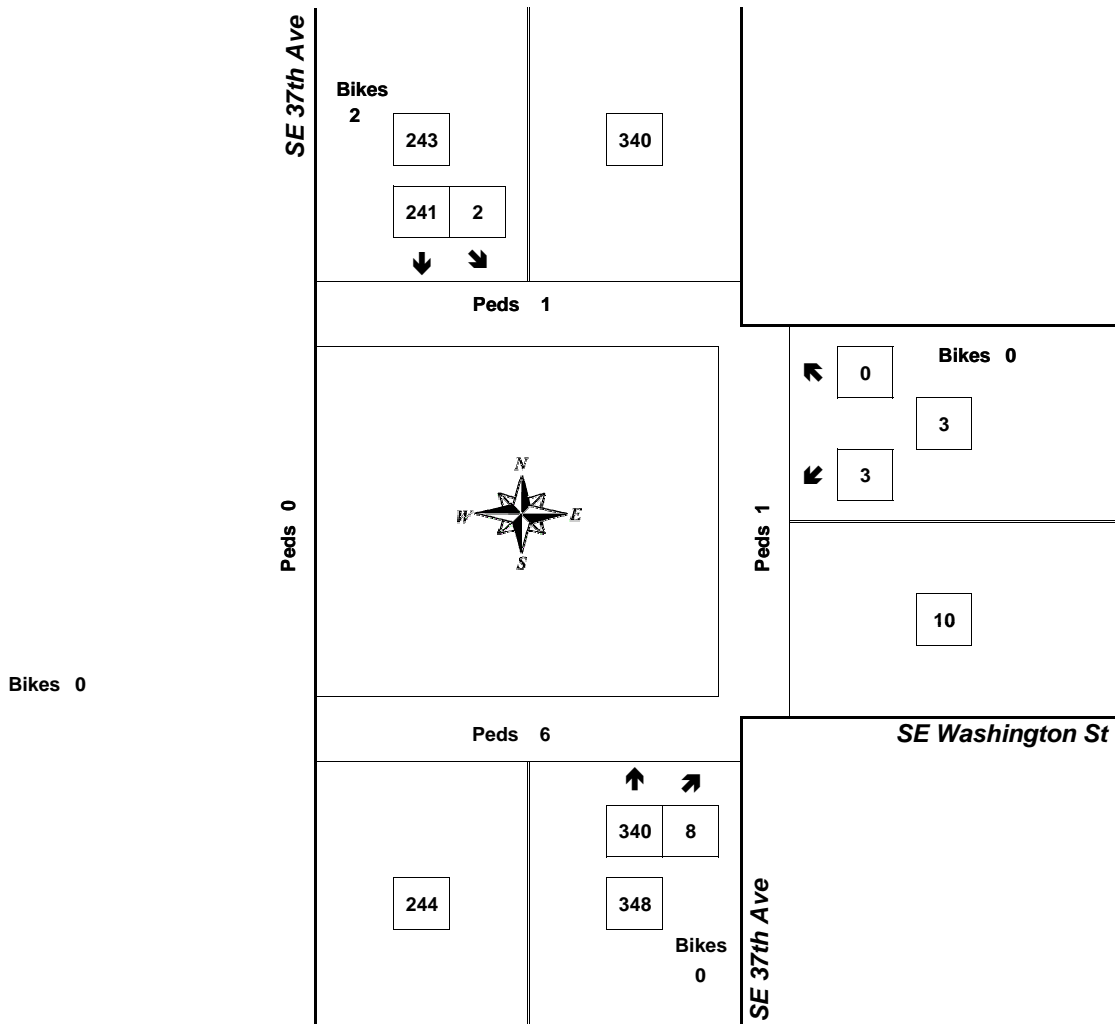
Peak Hour Summary



Clay Carney
(503) 833-2740

SE 37th Ave & SE Washington St

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

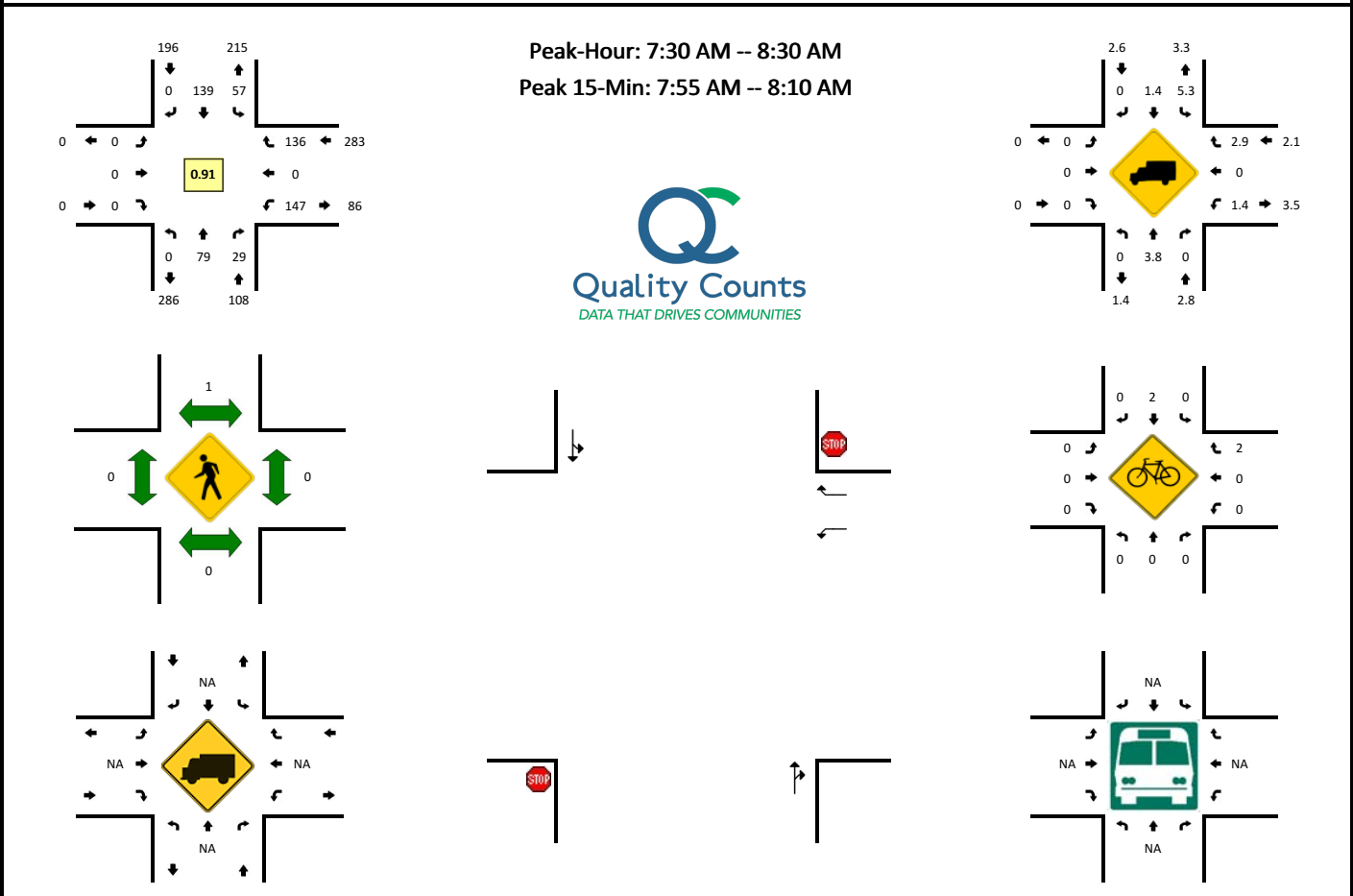


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.38	0.0%	3
NB	0.87	1.1%	348
SB	0.91	2.1%	243
Intersection	0.91	1.5%	594

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



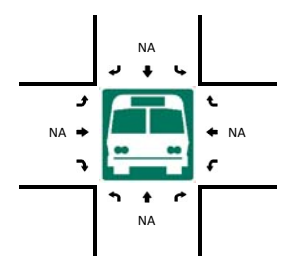
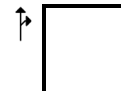
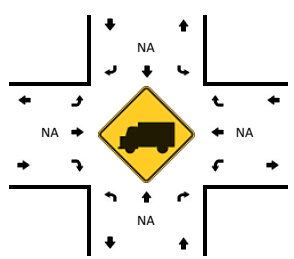
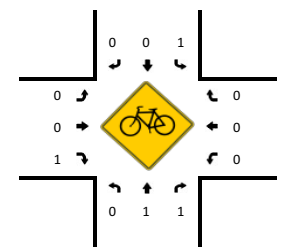
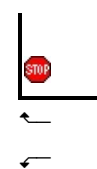
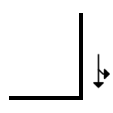
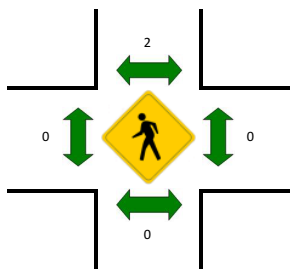
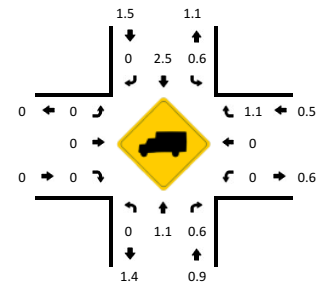
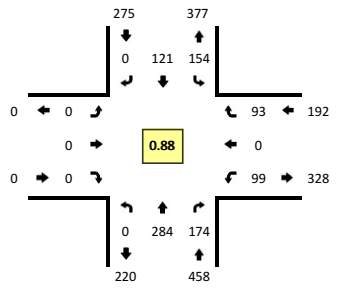
5-Min Count Period Beginning At	SE 37th Ave (Northbound)				SE 37th Ave (Southbound)				SE Railroad Ave (Eastbound)				SE Railroad Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	2	0	0	1	10	0	0	0	0	0	0	8	0	8	0	29	
7:05 AM	0	4	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

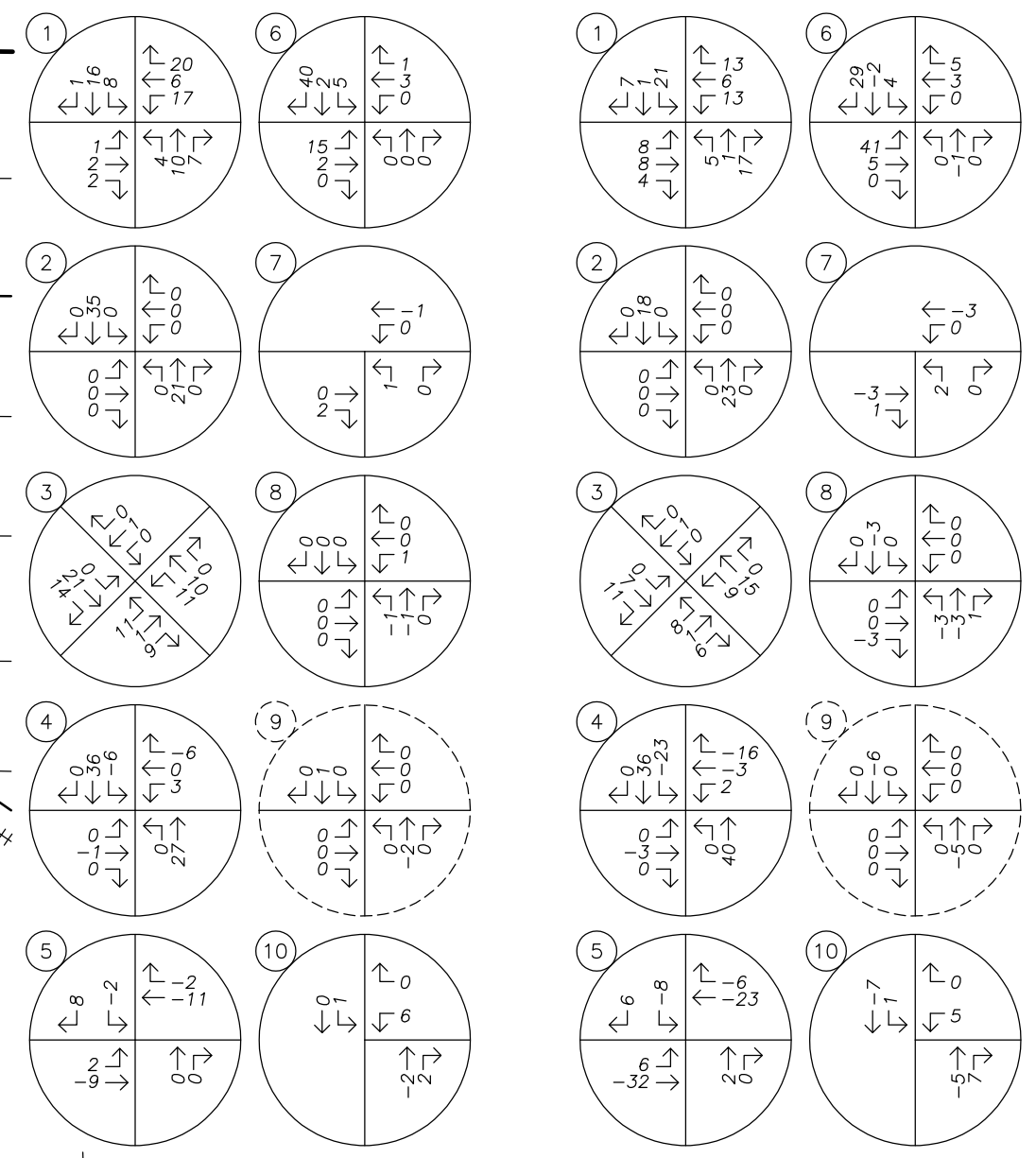
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	356	188	0	168	104	0	0	0	0	0	0	116	0	120	0	1052	
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	4		8	
Pedestrians		0				0				0				0				0
Bicycles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

Comments:



AM PEAK HOUR

PM PEAK HOUR



TRAFFIC VOLUMES
In-Process Development Trips
AM & PM Peak Hours

FIGURE A



No Scale



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
YEAR: 2016														
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
YEAR 2016 TOTAL	0	4	4	8	0	6	1	4	3	3	5	8	0	0
YEAR: 2015														
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
YEAR 2015 TOTAL	1	4	1	6	1	7	0	5	1	6	0	6	0	0
YEAR: 2014														
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
YEAR 2014 TOTAL	0	1	2	3	0	1	0	3	0	3	0	3	0	0
YEAR: 2013														
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
YEAR 2013 TOTAL	0	2	4	6	0	2	0	3	3	4	2	6	0	0
YEAR: 2012														
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

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
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

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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

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

24 - 27 of 32 Crash records shown.

SER#	S D	P R S W DATE	CLASS	CITY STREET	INT-TYPE	RD CHAR	(MEDIAN) INT-REL	OFFRD WTHR	CRASH	SPCL USE	MOVE	A S	PRTC INJ	G E LICNS	PED	ERROR	ACT	EVENT	CAUSE			
INVEST	E A U C O DAY		DIST	FIRST STREET						TRLR QTY												
RD DPT	E L G H R TIME		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						
01129		N N N N N	03/31/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01 NONE	0	STRGHT					04			
CITY			TU		HARRISON ST	CN		TRF SIGNAL	N	WET	TURN	PRVTE	S -N					000	00			
N			4P			02	0		N	DAY	INJ	PSNGR CAR		01 DRVR	INJB	84 F	OR-Y	020	000	04		
N			45 26 47.55	-122 37	017100100S00		56.24															
												01 NONE	0	STRGHT								
												PRVTE	S -N						000	00		
												PSNGR CAR		02 PSNG	INJB	72 F			000	000	00	
												02 NONE	0	TURN-L						000	00	
												PRVTE	N -E						000	000	00	
												PSNGR CAR		01 DRVR	INJC	55 M	OR-Y	000	000	00	00	
01895		N N N	05/18/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE	0	TURN-R					004	29		
NONE			MO		HARRISON ST	CN		TRF SIGNAL	N	DRY	REAR	PRVTE	E -N						000	00		
N			3P			02	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	39 M	OR-Y	026	000	000	29	
N			45 26 47.55	-122 37	017100100S00		56.24															
												02 NONE	0	STOP							00	
												PRVTE	E -N							013	004	00
												PSNGR CAR		01 DRVR	INJC	53 M	OR-Y	000	000	000	00	
												02 NONE	0	STOP							00	
												PRVTE	E -N							013	004	00
												PSNGR CAR		02 PSNG	INJC	59 F			000	000	00	00
00101		N N N	01/09/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT							02	
NONE			FR		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN	PRVTE	E -W							000	00	
N			7A			02	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	48 F	OR-Y	000	000	000	00	
N			45 26 47.55	-122 37	017100100S00		56.24															
												02 NONE	0	TURN-L							000	00
												UNKN	W -N								000	00
												UNKNOWN		01 DRVR	NONE	00 M	UNK	028,004	000	000	02	02
01634		N N N N N	04/10/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT							04	
CITY			SU		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN	PRVTE	S -N							000	00	
N			10P			04	0		N	DLIT	INJ	PSNGR CAR		01 DRVR	INJC	23 F	OR-Y	020	000	000	04	
N			45 26 47.55	-122 37	017100100S00		56.24															
												02 NONE	0	TURN-L							000	00
												PRVTE	N -E							000	000	00
												PSNGR CAR		01 DRVR	INJA	25 M	OTH-Y	000	000	000	00	00

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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

28 - 31 of 32 Crash records shown.

SER#	S	D	P	R	S	W	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	SPCL USE	MOVE		A	S															
INVEST	E	A	U	C	O	DAY		DIST	FIRST STREET		(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY															
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		
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																						
																	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	00	02		
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																						
																	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	00	02		
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																						
																	02	NONE	9	STRGHT											
																	N/A	W -E											000	00	
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00	00		
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																						
																	02	NONE	9	STRGHT											
																	N/A	W -E											000	00	
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00	00		

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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	RD CHAR	INT-TYPE	SPCL USE	MOVE	A S		
INVEST	E A U C O DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	TRLR QTY	MOVE	A S		
RD DPT	E L G H R TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	OWNER	FROM	PRTC INJ G E LICNS PED		
UNLOC?	D C S L K LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	V# TYPE	TO	P# TYPE SVRTY E X RES LOC ERROR ACT EVENT CAUSE		
05819	N N N	12/14/2016	12	CLACKAMAS HY	INTER	CROSS	01 NONE 9	STRGHT		093	04
NO RPT		WE		HARRISON ST	CN	TRF SIGNAL	N/A	E -W		000	00
N		8A			02	0	PSNGR CAR		01 DRVR NONE 00 Unk UNK	000	000
N		45 26 47.55	-122 37 56.24	017100100S00							
							02 NONE 9	STRGHT			
							N/A	S -N		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
YEAR: 2016														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR 2016 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2015														
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
YEAR 2015 TOTAL	0	1	2	3	0	2	0	2	1	2	1	3	0	0
YEAR: 2014														
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
YEAR 2014 TOTAL	0	2	1	3	0	2	0	3	0	3	0	3	0	0
YEAR: 2013														
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
YEAR 2013 TOTAL	0	2	0	2	0	4	0	0	2	2	0	2	0	0
YEAR: 2012														
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#	P	R S W DATE	CLASS	CITY STREET	INT-TYPE	RD CHAR	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A S	P	R	E	L	C	N	P	E	R	R	E	R	A	C	E	C			
INVEST	E	A U C O DAY	DIST	FIRST STREET	(MEDIAN)	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	A S	P	R	E	L	C	N	P	E	R	R	E	R	A	C	E	C			
RD DPT	E	L G H R TIME	FROM	SECOND STREET	LEGS	DIRECT	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	L	C	N	P	E	R	R	E	R	A	C	E	C			
UNLOC?	D	C S L K LAT	LONG	LRS	(#LANES)	LOCTN	CONTL	DRVWY	LIGHT	SVRTY	V# TYPE	TO	P# TYPE	SVRTY	E	X	RES	PED	LOC	ERROR	ACT	EVENT	CAUSE									
03587	N	N N N N N 09/24/2013	12	CLACKAMAS HY	CROSS	INTER	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		N	DAY	INJ	PSNGR CAR		01	DRVR	INJC	59	F	OR-Y		026		000								07		
	N	45 26 42.6596639	-122 37 54.105024	017100100S00														OR<25														
											02 NONE 0	STOP																	011	013	00	
											PRVTE	N -S																000	000	00		
											PSNGR CAR		01	DRVR	INJC	33	M	OR-Y		000		000									00	
											03 NONE 0	STOP																	022	00		
											PRVTE	N -S																000	000	00		
											PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000		000									00	
											03 NONE 0	STOP																	022	00		
											PRVTE	N -S																000	000	00		
											PSNGR CAR		02	PSNG	NO<5	01	M				000		000								00	
											03 NONE 0	STOP																	022	00		
											PRVTE	N -S																000	000	00		
											PSNGR CAR		03	PSNG	NO<5	04	F				000		000								00	
03680	N	N N N N N 09/19/2014	12	CLACKAMAS HY	CROSS	INTER	N	N	CLR	S-1STOP	01 NONE 0	STRGHT																				
	NONE	FR		MONROE ST		N	TRF SIGNAL	N	DRY	REAR	PRVTE	N -S																	000	00		
	N	5P				06		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		043,026		000								07		
	N	45 26 42.66 54.11	-122 37 54.11	017100100S00																												
											02 NONE 0	STOP																	011	00		
											PRVTE	N -S																000	000	00		
											PSNGR CAR		01	DRVR	INJC	27	F	OR-Y		000		000									00	
00337	N	N N N N N 01/25/2014	17	CLACKAMAS HY	CROSS	INTER	N	N	CLR	S-1STOP	01 NONE 0	STRGHT																				
	CITY	SA		MONROE ST		E	TRF SIGNAL	N	DRY	REAR	PRVTE	E -W																000	00			
	N	4P				06		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		026		000									07	
	N	45 26 42.6596999	-122 37 54.1050599	0171AC100S00																												
											02 NONE 0	STOP																	011	00		
											PRVTE	E -W																000	000	00		
											PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		000		000									00	
00110	N	N N N N N 01/10/2012	12	CLACKAMAS HY	CROSS	INTER	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		N	DARK	INJ	PSNGR CAR		01	DRVR	NONE	28	F	OR-Y		029		000								02		
	N	45 26 42.6407316	-122 37 54.0991865	017100100S00																												

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

9 - 11 of 11 Crash records shown.

Table with columns: SER#, INVEST RD UNLOC?, DPT, D, S, C, L, K, W, DATE, CLASS, CITY STREET, INT-TYPE, RD CHAR, (MEDIAN) INT-REL, OFFRD WTHR, CRASH, SPCL USE, MOVE, A, S, PRTC, INJ, G, E, LICNS, PED, ERROR, ACT, EVENT, CAUSE. Includes rows for crash IDs 02411, 03574, and 02887.

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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
YEAR: 2016														
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
YEAR 2016 TOTAL	0	4	4	8	0	6	0	4	4	6	2	8	0	0
YEAR: 2015														
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
YEAR 2015 TOTAL	0	3	1	4	0	3	1	2	1	3	1	4	0	0
YEAR: 2014														
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
YEAR 2014 TOTAL	0	5	2	7	0	10	0	5	2	4	3	7	0	0
YEAR: 2013														
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
YEAR 2013 TOTAL	0	5	6	11	0	5	1	9	2	8	3	11	0	0

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
YEAR: 2012														
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
YEAR 2012 TOTAL	0	0	6	6	0	0	0	4	2	3	3	6	0	0
FINAL TOTAL	0	17	19	36	0	24	2	24	11	24	12	36	0	0

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

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

15 - 19 of 36 Crash records shown.

SER#	S	D	P	R	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE																				
INVEST	E	A	U	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE															
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			
04617	N	N	N	N	N	11/05/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	O-1STOP	01	NONE	1	BACK													
CITY						TH		OAK ST	NW		TRF SIGNAL	N	WET	BACK		PRVTE	SE-NW									000		00			
N						5P			06	0		N	DLIT	INJ		SEMI TOW			01	DRVR	NONE	50	M	OTH-Y	011		000	10			
N						45 26 36.14	-122 37 47.2	017100100S00																							
															02	NONE	0	STOP													
																PRVTE	NW-SE									011		00			
																PSNGR	CAR		01	DRVR	INJC	36	F	OR-Y	000	000	000	00			
02231	N	N	N			05/17/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	9	STRGHT													
NONE						TU		OAK ST	NW		TRF SIGNAL	N	DRY	REAR		N/A	NW-SE									000		00			
N						4P			06	0		N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00	00			
N						45 26 36.14	-122 37 47.2	017100100S00																							
															02	NONE	9	STOP													
																N/A	NW-SE									011		00			
																PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	000	00			
00733	N	N	N	N	N	02/25/2012	12	CLACKAMAS HY	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE	0	STRGHT													
CITY						SA		OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	NW-SE									000		00			
N						8P			03	0		N	DLIT	PDO		PSNGR	CAR		01	DRVR	NONE	17	M	OR-Y	000	000	00				
N						45 26 36.1368192	-122 37 47.1996032	017100100S00																							
															02	TAXI	0	TURN-L													
																PRVTE	SE-SW									000		00			
																PSNGR	CAR		01	DRVR	NONE	37	M	OR-Y	028,004	000	000	02			
01126	N	N	N	N	N	03/07/2012	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	STRGHT													
NONE						WE		OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW-NE									000		00			
N						3P			04	0		N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	18	M	OR-Y	020	000	04				
N						45 26 36.1368192	-122 37 47.1996032	017100100S00																							
															02	NONE	0	TURN-L													
																PRVTE	NE-SE									000		00			
																PSNGR	CAR		01	DRVR	NONE	42	M	OR-Y	028	000	000	02			
03465	N	N	N			09/18/2012	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	STRGHT													
NONE						TU		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	27	M	OR-Y	000	000	00				
N						45 26 36.1368192	-122 37 47.1996032	017100100S00																							
															02	NONE	0	TURN-L													
																PRVTE	NE-SE									000		00			
																PSNGR	CAR		01	DRVR	NONE	22	M	OR-Y	028,004	000	000	02			

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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
YEAR: 2016														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR 2016 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2015														
TURNING MOVEMENTS	0	2	2	4	0	2	0	2	2	2	2	4	0	0
YEAR 2015 TOTAL	0	2	2	4	0	2	0	2	2	2	2	4	0	0
YEAR: 2014														
PEDESTRIAN	0	1	0	1	0	1	0	0	1	0	1	1	0	0
YEAR 2014 TOTAL	0	1	0	1	0	1	0	0	1	0	1	1	0	0
YEAR: 2013														
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
YEAR 2013 TOTAL	0	2	1	3	0	3	0	1	1	2	1	3	0	0
YEAR: 2012														
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
YEAR 2012 TOTAL	0	1	1	2	0	1	0	1	1	1	1	2	0	0
FINAL TOTAL	0	6	5	11	0	7	0	4	6	6	5	11	0	0

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

CITY OF MILWAUKIE, CLACKAMAS COUNTY

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

1 - 4 of 11 Crash records shown.

SER#	S 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	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	
05081	N N N 12/30/2013	12	CLACKAMAS HY	INTER	CROSS	N	N	UNK	S-1STOP	01 NONE 0	STRGHT									
NONE	MO		EDISON ST	SE		TRF SIGNAL	N	UNK	REAR	PRVTE	SE-NW						000		00	
N	5P			06	0		N	DUSK	PDO	PSNGR CAR		01 DRVR	NONE	23 F	OR-Y	026	000		07	
N	45 26 21.5604599	-122 37 29.0407439	017100100S00												OR<25					
										02 NONE 0	STOP									
										PRVTE	SE-NW						011		00	
										PSNGR CAR		01 DRVR	NONE	67 F	OR-Y	000	000		00	
															OR<25					
00864	N N N N N 03/01/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	PED	01 NONE 0	STRGHT								18,19,14	
CITY	SA		EDISON ST	SE		TRF SIGNAL	N	WET	PED	PRVTE	SE-NW								000	00
N	8P			06	0		N	DUSK	INJ	PSNGR CAR		01 DRVR	NONE	31 F	OR-Y	000	000		00	
N	45 26 21.5604599	-122 37 29.0407439	017100100S00												OR<25					
											STRGHT	01 PED	INJA	16 M		I XWLK	019,028	035	18,19,14	
											SW NE									
02682	N N N 06/14/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	S-1STOP	01 NONE 9	STRGHT								29	
NO RPT	TU		EDISON ST	SE		TRF SIGNAL	N	WET	REAR	N/A	SE-NW								000	00
N	5P			06	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00 Unk	UNK	000	000		00	
N	45 26 21.56	-122 37 29.04	017100100S00												UNK					
										02 NONE 9	STOP									
										N/A	SE-NW								011	
										PSNGR CAR		01 DRVR	NONE	00 Unk	UNK	000	000		00	
															UNK				00	
04728	N N N N N 12/07/2012	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	S-1STOP	01 NONE 0	STRGHT								07	
CITY	FR		EDISON ST	NW		TRF SIGNAL	N	WET	REAR	PRVTE	W -E								000	00
N	3P			06	0		N	DUSK	PDO	PSNGR CAR		01 DRVR	NONE	21 F	OR-Y	026	000		07	
N	45 26 21.560491	-122 37 29.0407751	017100100S00												OR<25					
										02 NONE 0	STOP									
										PRVTE	W -E								011	
										PSNGR CAR		01 DRVR	NONE	28 F	OTH-Y	000	000		00	
															N-RES					
02729	N N N 07/27/2013	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT								07	
CITY	SA		EDISON ST	NW		TRF SIGNAL	N	DRY	REAR	PRVTE	NW-SE								000	00
N	1P			06	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	52 M	OR-Y	026	000		07	
N	45 26 21.5604599	-122 37 29.0407439	017100100S00												OR<25					
										02 NONE 0	STOP									
										PRVTE	NW-SE								011	
										PSNGR CAR		01 DRVR	NONE	38 F	OR-Y	000	000		00	
															OR<25					

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URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

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

5 - 9 of 11 Crash records shown.

SER#	P	R	S	W	DATE	CLASS	CITY STREET	INT-TYPE						SPCL USE		PRTC	INJ	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE	
								RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY											MOVE
INVEST	E	A	U	C	O	DAY	DIST	FIRST STREET	DIRECT	LEGS	TRAF-	RDNBT	SURF	COLL	OWNER	FROM										
RD DPT	E	L	G	H	R	TIME	FROM	SECOND STREET																		
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		
															02	NONE	0	STOP								
01745	N	N	N	N	05/11/2012	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	STRGHT									
STATE							EDISON ST	CN		L-GRN-SIG	N	DRY	TURN		PRVTE		NW-SE									
N								01	0		N	DAY	INJ		PSNGR	CAR			01	DRVR	INJC	22	M	OR-Y	000	
N					45 26 21.560491		-122 37 29.0407751	017100100S00																		
04960	N	N	N	N	12/21/2013	12	CLACKAMAS HY	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	0	STRGHT									
CITY							EDISON ST	CN		TRF SIGNAL	N	WET	ANGL		PRVTE		SW-NE									
N								04	0		N	DAY	INJ		PSNGR	CAR			01	DRVR	INJC	33	F	OR-Y	000	
N					45 26 21.5604599		-122 37 29.0407439	017100100S00																		
00404	N	N	N		02/01/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE	0	STRGHT									
CITY							EDISON ST	CN		TRF SIGNAL	N	WET	TURN		PRVTE		SE-NW									
N								04	1		N	DAY	INJ		PSNGR	CAR			01	DRVR	NONE	34	M	OR-Y	020	
N					45 26 21.56 29.04		-122 37 29.04	017100100S00																		
05051	N	N	N	N	11/29/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	TURN-R									
CITY							EDISON ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE		NE-NW									
N								02	1		N	DUSK	INJ		PSNGR	CAR			01	DRVR	INJC	76	M	OR-Y	028	
N					45 26 21.56 29.04		-122 37 29.04	017100100S00																		

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

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

10 - 11 of 11 Crash records shown.

SER#	S	D	P	R	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE																			
INVEST	E	A	U	C	O	DAY		DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE													
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	
03416	N	N	N	N	N	08/22/2015		12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	TURN-L											
NONE						SA			EDISON ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE		NE-SE							000			00	
N						10P				03	0		N	DLIT	PDO		PSNGR CAR			01	DRVR	NONE	17	M	OR-Y	028	000		02	
N						45 26 21.56 -122 37 29.04			017100100S00															OR<25						
																	01	NONE	0	TURN-L										
																	PRVTE		NE-SE						000			00		
																	PSNGR CAR			02	PSNG	NO<5	02	M		000	000		00	
																	02	NONE	0	STRGHT						000	000		00	
																	PRVTE		SW-NE										00	
																	PSNGR CAR			01	DRVR	NONE	22	M	NONE	000	000		00	
																								OR<25						
03609	N	N	N	N	N	09/03/2015		12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE	0	STRGHT									013	02,32	
CITY						TH			EDISON ST	CN		TRF SIGNAL	N	WET	TURN		PRVTE		SW-NE							000			00	
N						4P				03	1		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	66	M	OR-Y	000	000		00	
N						45 26 21.56 -122 37 29.04			017100100S00																OR<25					
																	02	NONE	0	TURN-L							000	013	00	
																	PRVTE		NE-SE										00	
																	PSNGR CAR			01	DRVR	NONE	23	M	OR-Y	028,004,052	000		02,32	
																									OR<25					
																	03	NONE	0	STOP							011	00		
																	PRVTE		SE-NW										00	
																	PSNGR CAR			01	DRVR	NONE	34	F	OR-Y	000	000		00	
																									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

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
YEAR: 2016														
TURNING MOVEMENTS	0	1	1	2	0	1	0	1	1	2	0	2	0	0
YEAR 2016 TOTAL	0	1	1	2	0	1	0	1	1	2	0	2	0	0
YEAR: 2015														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR 2015 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2013														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR 2013 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	2	2	4	0	2	0	3	1	4	0	4	0	0

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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

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#	INVEST	RD DPT	UNLOC?	P	R	S	W	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	PRTC	INJ	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE	
	E	L	D	A	U	C	O	DAY	DIST	FIRST STREET	DIRECT	(MEDIAN)	TRAF-	RNDBT	SURF	COLL	TRLR QTY	FROM	P#	TYPE	SVRTY	E	X	RES	LOC				
	E	L	D	A	U	C	O	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	P#	TYPE	SVRTY	E	X	RES	LOC				
	D	C	S	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC					
02757	N	N	N				07/29/2013	12	EDISON ST	INTER	CROSS	N	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT							053	02	
	NO	RPT					MO		37TH AVE	CN			STOP SIGN	N	DRY	ANGL	PRVTE	S	-N							015	00		
	N						4P			04	0			N	DAY	PDO	PSNGR CAR		01	DRVR	NONE	58	F	OR-Y	028	000	02		
	N						45 26 22.217892	-122 37 27.115608	0171AF100S00																				
																	02	NONE	0	STRGHT									
																	PRVTE	SW-NE								000	00		
																	PSNGR CAR		01	DRVR	NONE	22	F	OR-Y	000	000	00		
01262	N	N	N				04/08/2015	19	EDISON ST	INTER	CROSS	N	N	N	CLR	S-OTHER	01	NONE	0	TURN-L								29	
	NONE						WE		37TH AVE	CN			UNKNOWN	N	DRY	TURN	UNKN	SW-N								000	00		
	N						4P			03	0			N	DAY	INJ	UNKNOWN		01	DRVR	NONE	00	Unk	UNK	026	000	29		
	N						45 26 22.22 27.12	-122 37 27.12	0171AE100S00																				
																	02	NONE	0	STOP							013	00	
																	PRVTE	SW-N								000	00		
																	PSNGR CAR		01	DRVR	INJC	47	M	OR-Y	000	000	00		
04430	N	N	N				09/29/2016	19	EDISON ST	INTER	CROSS	N	N	N	CLR	O-1 L-TURN	01	NONE	0	TURN-L								02	
	CITY						TH		37TH AVE	CN			TRF SIGNAL	N	DRY	TURN	PRVTE	SW-N								000	00		
	N						11A			02	0			N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	21	F	OR-Y	028	000	02		
	N						45 26 22.22 27.12	-122 37 27.12	0171AE100S00																				
																	02	NONE	0	STRGHT							000	00	
																	PRVTE	NE-SW								000	00		
																	PSNGR CAR		01	DRVR	INJC	40	F	OR-Y	000	000	00		
05446	N	N	N				11/23/2016	19	EDISON ST	INTER	CROSS	N	N	N	RAIN	ANGL-OTH	01	NONE	9	STRGHT								02	
	NONE						WE		37TH AVE	CN			UNKNOWN	N	WET	TURN	N/A	SW-NE								000	00		
	N						4P			04	1			N	DAY	PDO	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00		
	N						45 26 22.22 27.12	-122 37 27.12	0171AE100S00																				
																	02	NONE	9	TURN-R							000	00	
																	N/A	S -NE								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

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
YEAR: 2016														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
YEAR 2016 TOTAL	0	0	1	1	0	0	0	0	1	0	1	1	0	0
YEAR: 2014														
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
YEAR 2014 TOTAL	0	0	3	3	0	0	0	3	0	3	0	3	0	0
YEAR: 2013														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	1	0	0
YEAR 2013 TOTAL	0	0	1	1	0	0	0	0	1	0	1	1	0	0
YEAR: 2012														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR 2012 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	0	6	6	0	0	0	4	2	4	2	6	0	0

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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

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	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	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	
										02 NONE 0	STRGHT										
										PRVTE	S -N							015		00	
										PSNGR CAR		02	PSNG	NO<5	01	M	000	000		00	
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						015		00
N		6A			03	1		N	DLIT	PDO	PSNGR CAR		01	DRVR	NONE	00	Unk UNK		000	000	00
N		45 26 22.22	-122 37																		00
			27.12																		00
											02 NONE 9		STRGHT								00
											N/A		W -E							000	00
											PSNGR CAR		01	DRVR	NONE	00	Unk UNK		000	000	00
																					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

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
YEAR: 2016														
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
YEAR 2016 TOTAL	0	4	0	4	0	7	0	2	2	3	1	4	0	0
YEAR: 2015														
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	1	1	2	0	0
YEAR 2015 TOTAL	0	0	2	2	0	0	0	2	0	1	1	2	0	0
YEAR: 2014														
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
YEAR 2014 TOTAL	0	2	0	2	0	2	0	1	1	1	1	2	0	0
YEAR: 2013														
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
YEAR 2013 TOTAL	0	1	2	3	0	3	0	3	0	3	0	3	0	1
YEAR: 2012														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR 2012 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
FINAL TOTAL	0	7	5	12	0	12	0	8	4	9	3	12	0	1

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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#	P	R S W DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE
INVEST	E A U C O DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN) INT-REL	TRLR QTY MOVE
RD DPT	E L G H R TIME	FROM	SECOND STREET	DIRECT	LEGS TRAF-	OWNER FROM
UNLOC?	D C S L K LAT	LONG	LRS	LOCTN	(#LANES) CONTL	V# TYPE TO
02423	N N N N N	06/19/2015	16	HARRISON ST	CROSS	N
		FR	0	32ND AVE	NE	TRF SIGNAL
		10P		06	0	N
		45 26 47.73	-122 37 46.89			DRY TURN
						CLD O-1 L-TURN
						01 NONE 0 TURN-L
						PSNGR CAR
						01 DRVR NONE 34 M OTH-Y
						N-RES 028 000 02
						STRGHT
						02 NONE 0 S -N
						PRVTE 01 DRVR NONE 18 M OR-Y
						OR<25 000 000 00
						TURN-R
						01 NONE 0 TURN-R
						CLR FIX OBJ
						Y CLR FIX OBJ 01 NONE 0
						055 08
						W TRF SIGNAL
						DRY FIX
						01 DRVR NONE 54 M OR-Y
						OR<25 002 000 08
						STRGHT
						01 NONE 0 STRGHT
						CLR S-1STOP
						N CLR S-1STOP 01 NONE 0
						029
						W TRF SIGNAL
						DRY REAR
						01 DRVR NONE 60 M OR-Y
						OR<25 026 000 29
						STOP
						02 NONE 0 W -E
						PRVTE 01 DRVR INJC 34 M OR-Y
						OR<25 000 000 00
						TURN-R
						01 NONE 0 TURN-R
						UNK S-OTHER
						N UNK S-OTHER 01 NONE 0
						008
						CN L-GRN-SIG
						N CN L-GRN-SIG 01 NONE 0
						006 000 08
						PSNGR CAR
						01 DRVR NONE 00 F UNK
						UNK 006 000 08
						TURN-R
						02 NONE 0 N -W
						PRVTE 01 DRVR NONE 55 F OR-Y
						OR<25 000 000 00
						TURN-R
						02 NONE 0 N -W
						PRVTE 02 PSNG NO<5 02 F
						OR<25 000 000 00
						STRGHT
						01 NONE 0 STRGHT
						CLR O-1 L-TURN
						N CLR O-1 L-TURN 01 NONE 0
						002
						CN TRF SIGNAL
						DRY TURN
						01 DRVR NONE 63 F OR-Y
						OR<25 000 000 00
						PSNGR CAR
						01 DRVR NONE 63 F OR-Y
						OR<25 000 000 00
						TURN-L
						02 NONE 0 N -E
						PRVTE 01 DRVR NONE 17 F OR-Y
						OR<25 028,004 000 02
						PSNGR CAR
						01 DRVR NONE 17 F OR-Y
						OR<25 028,004 000 02

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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
YEAR: 2016														
TURNING MOVEMENTS	0	0	2	2	0	0	0	0	2	2	0	2	0	0
YEAR 2016 TOTAL	0	0	2	2	0	0	0	0	2	2	0	2	0	0
YEAR: 2014														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	0	1	1	0	1
YEAR 2014 TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	0	1
YEAR: 2013														
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
YEAR 2013 TOTAL	0	3	0	3	0	3	0	2	1	1	2	3	0	0
FINAL TOTAL	0	3	3	6	0	3	0	3	3	3	3	6	0	1

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

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															
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					
							02 NONE 9	TURN-R													
							N/A	SW-SE									015	00			
							PSNGR CAR		01	DRVR	NONE	00	Unk UNK				000	000	00		

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

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
YEAR: 2015														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR 2015 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2014														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
YEAR 2014 TOTAL	0	0	1	1	0	0	0	0	1	0	1	1	0	0
FINAL TOTAL	0	0	2	2	0	0	0	1	1	1	1	2	0	0

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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	MOVE	A	S																
INVEST	E	A	U	C	O	DAY	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE													
RD DPT	E	L	G	H	R	TIME	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												08
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									011		00
																PRVTE	W -E												
																PSNGR CAR			01	DRVR	NONE	54	M	OR-Y	000		000	00	
05178	N	Y	N	N	12/21/2014	17	MONROE ST	INTER	CROSS	N	N	CLD	ANGL-STP	01	NONE	0	TURN-R												08
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									012		00
																PRVTE	E -W												
																PSNGR CAR			01	DRVR	NONE	53	F	OR-Y	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

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
YEAR: 2015														
BACKING	0	0	1	1	0	0	1	1	0	1	0	1	0	0
YEAR 2015 TOTAL	0	0	1	1	0	0	1	1	0	1	0	1	0	0
FINAL TOTAL	0	0	1	1	0	0	1	1	0	1	0	1	0	0

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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

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

1 - 1 of 1 Crash records shown.

SER#	S		D		DATE	CLASS	CITY STREET		RD CHAR	INT-TYPE		SPCL USE		A S														
	P	R	S	W			FIRST STREET	RD CHAR		(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	PRTC	INJ	G	E	LICNS	PED						
INVEST	E	A	U	C	O	DIST	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
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	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
03078	N	N	N	N	N	07/30/2015	17	WASHINGTON ST	INTER	3-LEG	N	N	CLR	O-1STOP	01	NONE	0	BACK										
						TH	0	37TH AVE	N		BUS STPSGN	N	DRY	BACK		PRVTE	S -N								000		00	
						8A			06	0		N	DAY	PDO		TRUCK		01	DRVR	NONE	25	M	OR-Y		011		10	
						45 26 37.6	-122 37 27.87																					
															02	NONE	0	STOP										
																PRVTE	N -S									011		00
																PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		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

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
YEAR: 2014														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR 2014 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2012														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR 2012 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	0	2	2	0	0	0	1	1	2	0	2	0	0

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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

RAILROAD AVE 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	INT-TYPE	SPCL USE																						
INVEST	E A U C O DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN) INT-REL	OFFRD WTHR CRASH	TRLR QTY	MOVE																				
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													
04880	N N N	12/17/2012	17	RAILROAD AVE	INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE	0	STRGHT														07	
NO RPT		MO	0	37TH AVE	SE		STOP SIGN	N	DRY	REAR	PRVTE		SE-NW												000		00	
N		3P			06	0		N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	49	M	OR-Y		026				000		07	
N		45 26																										
		35.9224975																										
											02	NONE	0	STOP														
											PRVTE		SE-NW															00
											PSNGR	CAR		01	DRVR	NONE	48	F	OR-Y		000				000		00	
01561	Y N N N N	04/23/2014	17	RAILROAD AVE	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01 NONE	0	STRGHT														30,02	
CITY		WE	0	37TH AVE	CN		STOP SIGN	N	WET	TURN	PRVTE		S -N														00	
N		3P			02	0		N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	62	M	OR-Y		050				000		30	
N		45 26																										
		35.718936																										
											02	NONE	0	TURN-L														
											PRVTE		E -S															00
											PSNGR	CAR		01	DRVR	NONE	39	F	OR-Y		028				000		02	
											02	NONE	0	TURN-L														
											PRVTE		E -S															00
											PSNGR	CAR		02	PSNG	NO<5	03	F			000				000		00	

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Left-Turn Lane Warrant Analysis



Project: Monroe Apartments
 Intersection: SE Washington Street at SE 37th Avenue
 Date: 9/23/2019
 Scenario: 2022 Buildout Conditions - AM Peak Hour (NB)

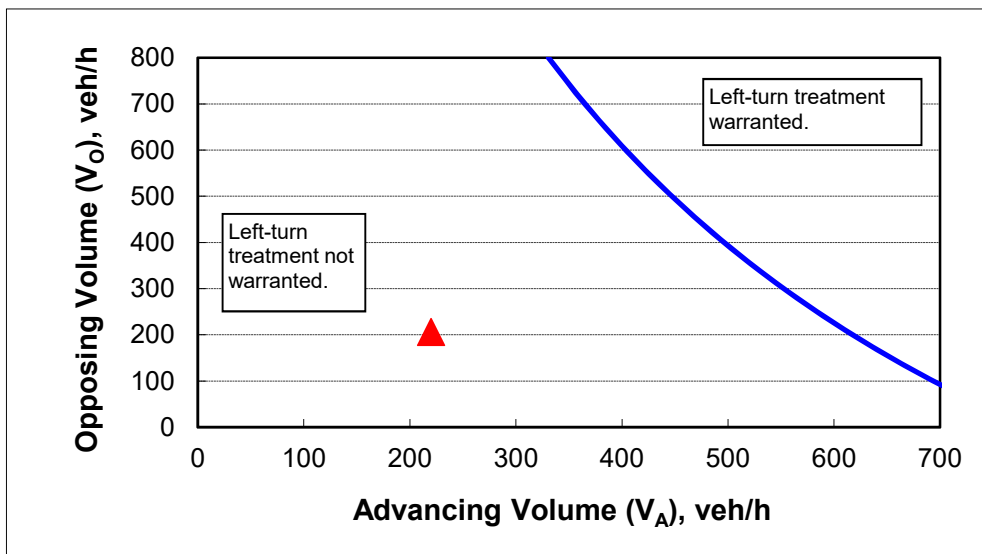
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	6%
Advancing volume (V_A), veh/h:	220
Opposing volume (V_O), veh/h:	206

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	613
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



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: 9/23/2019
 Scenario: 2022 Buildout Conditions - AM Peak Hour (SB)

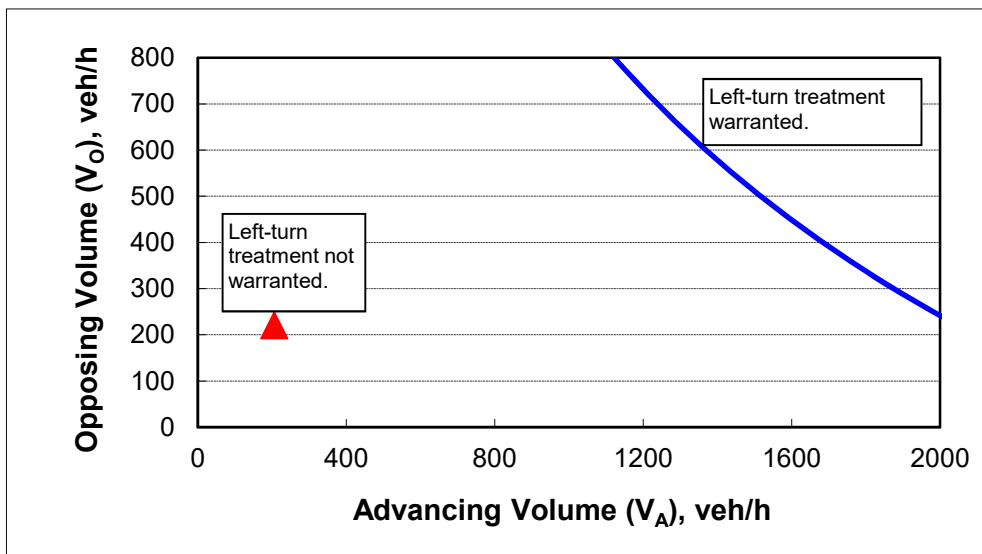
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	206
Opposing volume (V_O), veh/h:	220

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	2049
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



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: 9/23/2019
 Scenario: 2022 Buildout Conditions - PM Peak Hour (NB)

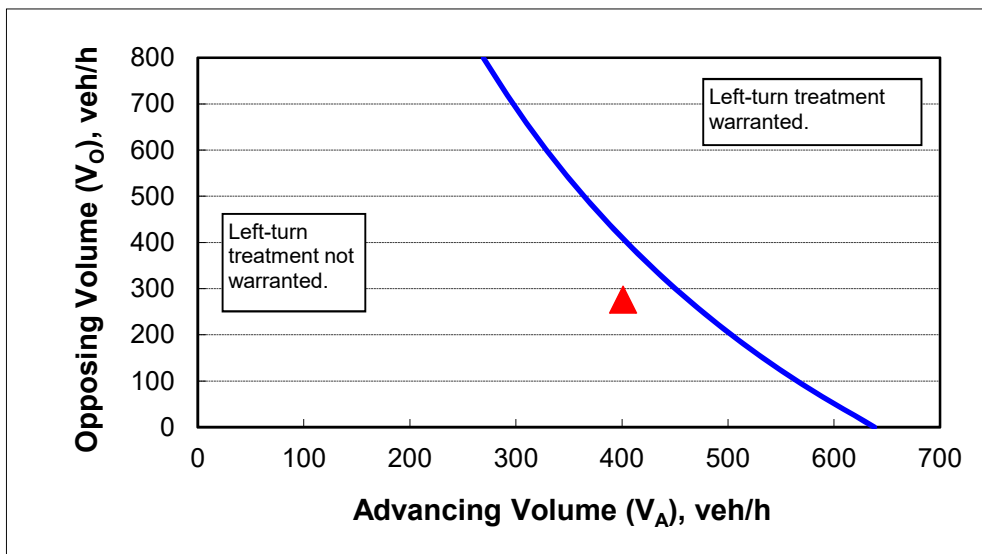
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	9%
Advancing volume (V_A), veh/h:	401
Opposing volume (V_O), veh/h:	276

OUTPUT

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



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: 9/23/2019
 Scenario: 2022 Buildout Conditions - PM Peak Hour (SB)

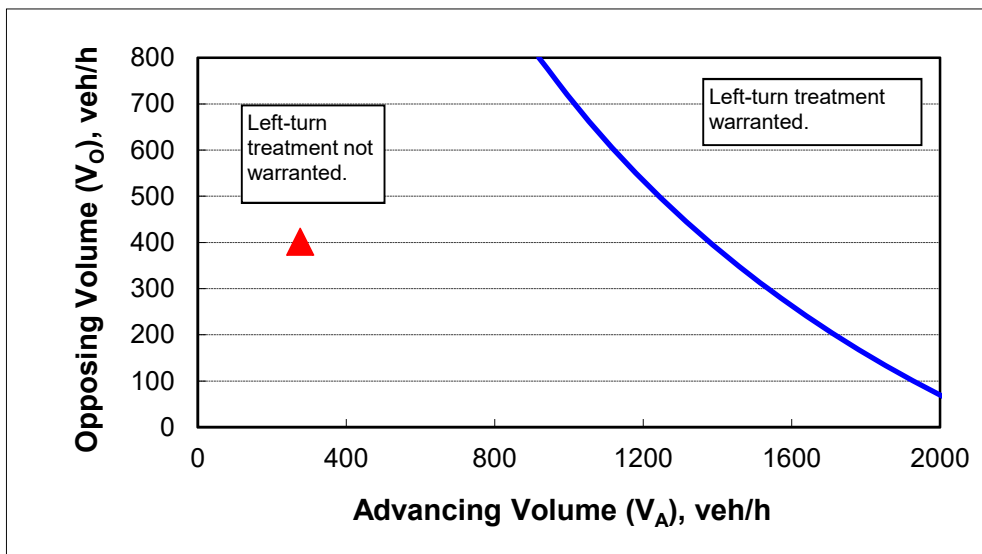
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	276
Opposing volume (V_O), veh/h:	401

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1379
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



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: 9/23/2019
 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: 527 PM Peak Hour Volumes: 152

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
WARRANT 1, CONDITION A					
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
WARRANT 1, CONDITION 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	5,270	8,850	
Minor Street*	1,520	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	5,270	13,300	
Minor Street*	1,520	1,350	No
<i>Combination Warrant</i>			
Major Street	5,270	10,640	
Minor Street*	1,520	2,120	No

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

Traffic Signal Warrant Analysis



Project: Monroe Apartments
 Date: 9/23/2019
 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:	496	PM Peak Hour Volumes:	271

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)	
<u>Major St.</u>	<u>Minor St.</u>	<u>100% Warrants</u>	<u>70% Warrants</u>	<u>100% Warrants</u>	<u>70% Warrants</u>
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

WARRANT 1, CONDITION 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	4,960	10,600	
Minor Street*	2,710	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	4,960	15,900	
Minor Street*	2,710	1,350	No
<i>Combination Warrant</i>			
Major Street	4,960	12,720	
Minor Street*	2,710	2,120	No

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

Traffic Signal Warrant Analysis



Project: Monroe Apartments
 Date: 9/23/2019
 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:	698	PM Peak Hour Volumes:	346

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)	
<u>Major St.</u>	<u>Minor St.</u>	<u>100% Warrants</u>	<u>70% Warrants</u>	<u>100% Warrants</u>	<u>70% Warrants</u>
WARRANT 1, CONDITION A					
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
WARRANT 1, CONDITION 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	6,980	8,850	
Minor Street*	3,460	3,550	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	6,980	13,300	
Minor Street*	3,460	1,750	No
<i>Combination Warrant</i>			
Major Street	6,980	10,640	
Minor Street*	3,460	2,840	No

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

Traffic Signal Warrant Analysis



Project: Monroe Apartments
 Date: 9/23/2019
 Scenario: 2022 Buildout Conditions

Major Street: SE Washington Street Minor Street: SE 37th Avenue
 Number of Lanes: 1 Number of Lanes: 1
 PM Peak Hour Volumes: 677 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
WARRANT 1, CONDITION A					
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
WARRANT 1, CONDITION 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	6,770	8,850	
Minor Street*	330	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	6,770	13,300	
Minor Street*	330	1,350	No
<i>Combination Warrant</i>			
Major Street	6,770	10,640	
Minor Street*	330	2,120	No

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

Traffic Signal Warrant Analysis



Project: Monroe Apartments
 Date: 9/23/2019
 Scenario: 2022 Buildout Conditions

Major Street:	SE 37th Avenue	Minor Street:	SE Railroad Avenue
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	830	PM Peak Hour Volumes:	187

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)	
<u>Major St.</u>	<u>Minor St.</u>	<u>100% Warrants</u>	<u>70% Warrants</u>	<u>100% Warrants</u>	<u>70% Warrants</u>
WARRANT 1, CONDITION A					
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
WARRANT 1, CONDITION 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	8,300	8,850	
Minor Street*	1,870	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	8,300	13,300	
Minor Street*	1,870	1,350	No
<i>Combination Warrant</i>			
Major Street	8,300	10,640	
Minor Street*	1,870	2,120	No

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

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019



Lane Group	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	
Storage Length (ft)	0		200	0		200	170		200	640		160	
Storage Lanes	0		1	0		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Ped Bike Factor		1.00			0.99								
Frt		0.966			0.913				0.850			0.850	
Flt Protected		0.995			0.996		0.950			0.950			
Satd. Flow (prot)	0	3017	0	0	3129	0	1719	3438	1538	1703	3406	1524	
Flt Permitted		0.787			0.912		0.950			0.950			
Satd. Flow (perm)	0	2386	0	0	2865	0	1719	3438	1538	1703	3406	1524	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		37			137				73			73	
Link Speed (mph)		25			25			40				40	
Link Distance (ft)		532			677			514				440	
Travel Time (s)		14.5			18.5			8.8				7.5	
Confl. Peds. (#/hr)	2						2						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%	
Adj. Flow (vph)	19	127	42	41	188	312	60	1887	58	95	930	14	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	188	0	0	541	0	60	1887	58	95	930	14	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		0			0			12				12	
Link Offset(ft)		0			0			0				0	
Crosswalk Width(ft)		16			16			16				16	
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15		9	15		9	15		9	15		9	
Number of Detectors	1	2		1	2		1	2	1	1	2	1	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel													
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94		
Detector 2 Size(ft)		6			6			6			6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel													
Detector 2 Extend (s)		0.0			0.0			0.0			0.0		

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		13.4	56.5	56.5	11.0	54.1	54.1
Total Split (%)	25.0%	25.0%		25.0%	25.0%		14.9%	62.8%	62.8%	12.2%	60.1%	60.1%
Maximum Green (s)	18.0	18.0		18.0	18.0		8.9	52.0	52.0	6.5	49.6	49.6
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effect Green (s)		16.8			16.8		7.8	52.9	52.9	6.8	53.9	53.9
Actuated g/C Ratio		0.19			0.19		0.09	0.59	0.59	0.08	0.60	0.60
v/c Ratio		0.40			0.84		0.41	0.93	0.06	0.74	0.46	0.01
Control Delay		27.9			38.9		49.8	18.1	1.1	74.8	11.9	0.0
Queue Delay		0.0			0.0		0.0	0.8	0.0	0.0	0.0	0.0
Total Delay		27.9			38.9		49.8	18.9	1.1	74.8	11.9	0.0
LOS		C			D		D	B	A	E	B	A
Approach Delay		27.9			38.9			19.3			17.5	
Approach LOS		C			D			B			B	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 22.1
 Intersection LOS: C
 Intersection Capacity Utilization 88.8%
 ICU Level of Service E
 Analysis Period (min) 15





















Splits and Phases: 1: OR-224 & SE Harrison Street



HCM Signalized Intersection Capacity Analysis

1: OR-224 & SE Harrison Street

09/20/2019





















												
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	0.54	0.62	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	16.5	4.9	61.2	11.2	7.7
Level of Service		C			D		D	B	A	E	B	A
Approach Delay (s)		32.4			43.5			17.1			15.8	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			21.3				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 6th Signalized Intersection Summary

1: OR-224 & SE Harrison Street

09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	118	39	38	175	290	56	1755	54	88	865	13
Future Volume (veh/h)	18	118	39	38	175	290	56	1755	54	88	865	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1841	1841	1841	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	19	127	42	41	188	312	60	1887	58	95	930	14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	15	15	15	4	4	4	5	5	5	6	6	6
Cap, veh/h	51	280	104	86	288	283	77	2014	898	120	2085	930
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.04	0.58	0.58	0.07	0.61	0.61
Sat Flow, veh/h	0	1401	520	195	1439	1415	1739	3469	1547	1725	3441	1535
Grp Volume(v), veh/h	72	0	116	229	0	312	60	1887	58	95	930	14
Grp Sat Flow(s),veh/h/ln	490	0	1431	1634	0	1415	1739	1735	1547	1725	1721	1535
Q Serve(g_s), s	0.0	0.0	6.3	5.6	0.0	18.0	3.1	45.0	1.5	4.9	13.1	0.3
Cycle Q Clear(g_c), s	18.0	0.0	6.3	11.9	0.0	18.0	3.1	45.0	1.5	4.9	13.1	0.3
Prop In Lane	0.26		0.36	0.18		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	0	286	374	0	283	77	2014	898	120	2085	930
V/C Ratio(X)	0.49	0.00	0.40	0.61	0.00	1.10	0.78	0.94	0.06	0.79	0.45	0.02
Avail Cap(c_a), veh/h	148	0	286	374	0	283	172	2014	898	125	2085	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.90	0.00	0.90	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	0.0	31.3	33.4	0.0	36.0	42.6	17.4	8.2	41.2	9.6	7.1
Incr Delay (d2), s/veh	2.5	0.0	0.9	2.6	0.0	81.0	10.9	7.0	0.1	28.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	2.3	4.9	0.0	12.5	1.5	16.8	0.5	2.9	4.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	0.0	32.2	36.1	0.0	117.0	53.5	24.4	8.3	69.2	10.3	7.1
LnGrp LOS	C	A	C	D	A	F	D	C	A	E	B	A
Approach Vol, veh/h		188			541			2005			1039	
Approach Delay, s/veh		32.7			82.8			24.8			15.6	
Approach LOS		C			F			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.7	56.8		22.5	8.5	59.0		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.5	52.0		18.0	8.9	49.6		18.0				
Max Q Clear Time (g_c+I1), s	6.9	47.0		20.0	5.1	15.1		20.0				
Green Ext Time (p_c), s	0.0	4.3		0.0	0.0	7.4		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				31.0								
HCM 6th LOS				C								

Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	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
Storage Length (ft)	0		0	0		0	240		260	150		250
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			0.99				0.98	1.00		
Frt		0.921			0.931				0.850			0.850
Flt Protected		0.985			0.995		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1712	0	1719	3438	1538	1687	3374	1509
Flt Permitted		0.910			0.956		0.950			0.950		
Satd. Flow (perm)	0	1560	0	0	1645	0	1719	3438	1504	1687	3374	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60			24				73			73
Link Speed (mph)		25			25			40				40
Link Distance (ft)		550			530			831				514
Travel Time (s)		15.0			14.5			14.2				8.8
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	32	10	60	5	18	24	41	1934	14	5	984	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	102	0	0	47	0	41	1934	14	5	984	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Monroe Apartments 03/07/2019 Existing Conditions - AM Peak Hour
DS

Synchro 10 Report
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Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		11.0	58.0	58.0	9.5	56.5	56.5
Total Split (%)	25.0%	25.0%		25.0%	25.0%		12.2%	64.4%	64.4%	10.6%	62.8%	62.8%
Maximum Green (s)	18.0	18.0		18.0	18.0		6.5	53.5	53.5	5.0	52.0	52.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effect Green (s)		8.4			8.4		7.6	73.3	73.3	5.9	67.6	67.6
Actuated g/C Ratio		0.09			0.09		0.08	0.81	0.81	0.07	0.75	0.75
v/c Ratio		0.51			0.27		0.28	0.69	0.01	0.05	0.39	0.01
Control Delay		27.3			25.5		42.5	5.4	0.0	45.4	3.0	0.0
Queue Delay		0.0			0.0		0.0	0.1	0.0	0.0	0.0	0.0
Total Delay		27.3			25.5		42.5	5.5	0.0	45.4	3.0	0.0
LOS		C			C		D	A	A	D	A	A
Approach Delay		27.3			25.5			6.2			3.1	
Approach LOS		C			C			A			A	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	6.2
Intersection LOS:	A
Intersection Capacity Utilization:	70.2%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 2: OR-224 & SE Monroe Street



HCM Signalized Intersection Capacity Analysis

2: OR-224 & SE Monroe Street

09/20/2019



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	0.63	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	
Intersection Summary												
HCM 2000 Control Delay			6.7									A
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			90.0							13.5		
Intersection Capacity Utilization			70.2%									C
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th Signalized Intersection Summary
 2: OR-224 & SE Monroe Street

09/20/2019



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Traffic Volume (veh/h)	30	9	56	5	17	23	39	1818	13	5	925	15
Future Volume (veh/h)	30	9	56	5	17	23	39	1818	13	5	925	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1826	1826	1826	1796	1796	1796
Adj Flow Rate, veh/h	32	10	60	5	18	24	41	1934	14	5	984	16
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	2	2	2	5	5	5	7	7	7
Cap, veh/h	87	26	87	52	70	81	62	2601	1159	11	2460	1096
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.04	0.75	0.75	0.01	1.00	1.00
Sat Flow, veh/h	370	281	930	80	750	866	1739	3469	1546	1711	3413	1521
Grp Volume(v), veh/h	102	0	0	47	0	0	41	1934	14	5	984	16
Grp Sat Flow(s),veh/h/ln	1581	0	0	1697	0	0	1739	1735	1546	1711	1706	1521
Q Serve(g_s), s	3.2	0.0	0.0	0.0	0.0	0.0	2.1	28.4	0.2	0.3	0.0	0.0
Cycle Q Clear(g_c), s	5.5	0.0	0.0	2.3	0.0	0.0	2.1	28.4	0.2	0.3	0.0	0.0
Prop In Lane	0.31		0.59	0.11		0.51	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	201	0	0	203	0	0	62	2601	1159	11	2460	1096
V/C Ratio(X)	0.51	0.00	0.00	0.23	0.00	0.00	0.66	0.74	0.01	0.45	0.40	0.01
Avail Cap(c_a), veh/h	363	0	0	377	0	0	126	2601	1159	95	2460	1096
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.59	0.59	0.59	0.89	0.89	0.89
Uniform Delay (d), s/veh	39.4	0.0	0.0	38.0	0.0	0.0	42.9	6.4	2.8	44.3	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.6	0.0	0.0	6.9	1.2	0.0	23.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	1.0	0.0	0.0	1.0	6.8	0.0	0.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.4	0.0	0.0	38.6	0.0	0.0	49.8	7.5	2.9	67.2	0.4	0.0
LnGrp LOS	D	A	A	D	A	A	D	A	A	E	A	A
Approach Vol, veh/h		102			47			1989			1005	
Approach Delay, s/veh		41.4			38.6			8.4			0.8	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	72.0		12.9	7.7	69.4		12.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	53.5		18.0	6.5	52.0		18.0				
Max Q Clear Time (g_c+I1), s	2.3	30.4		7.5	4.1	2.0		4.3				
Green Ext Time (p_c), s	0.0	16.1		0.3	0.0	8.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Lanes, Volumes, Timings
3: SE Oak Street & OR-224

09/20/2019

												
Lane Group	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
Storage Length (ft)	80		80	180		180	400		250	540		150
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
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
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	3438	1538	1719	3438	1538	1719	3438	1538	1703	3406	1524
Flt Permitted	0.497			0.649			0.950			0.950		
Satd. Flow (perm)	895	3438	1511	1169	3438	1507	1719	3438	1538	1703	3406	1489
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			73			127			121
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		181			870			831			1978	
Travel Time (s)		4.9			23.7			14.2			33.7	
Confl. Peds. (#/hr)	5		4	4		5	1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%	6%
Adj. Flow (vph)	47	162	84	77	264	186	85	910	16	133	1633	161
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	162	84	77	264	186	85	910	16	133	1633	161
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

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Lanes, Volumes, Timings
3: SE Oak Street & OR-224

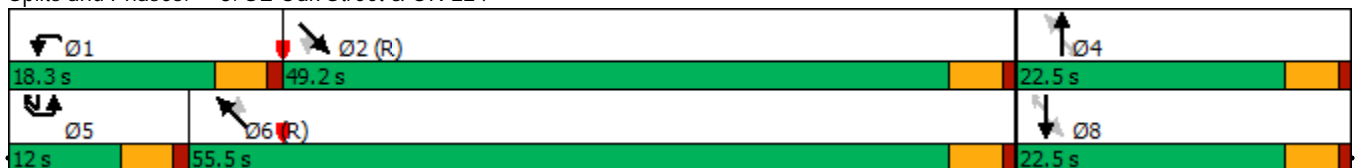
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Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	4	4	4	8	8	5	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	12.0	12.0	49.2	49.2	18.3	55.5	55.5
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	13.3%	13.3%	54.7%	54.7%	20.3%	61.7%	61.7%
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0	7.5	7.5	44.7	44.7	13.8	51.0	51.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	0
Act Effct Green (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
v/c Ratio	0.38	0.34	0.26	0.47	0.55	0.45	0.51	0.46	0.02	0.60	0.78	0.17
Control Delay	42.9	36.1	4.2	44.5	40.0	18.0	46.6	8.2	0.0	27.8	25.3	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	36.1	4.2	44.5	40.0	18.0	46.6	8.2	0.0	27.8	25.3	9.9
LOS	D	D	A	D	D	B	D	A	A	C	C	A
Approach Delay		28.0			32.9			11.3			24.2	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 22.2
 Intersection LOS: C
 Intersection Capacity Utilization 76.4%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 3: SE Oak Street & OR-224



























Monroe Apartments 03/07/2019 Existing Conditions - AM Peak Hour
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HCM Signalized Intersection Capacity Analysis

3: SE Oak Street & OR-224

























09/20/2019

												
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 (vphp)	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	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	0.58	1.65	3.30
Incremental Delay, d2	1.9	0.4	0.1	2.2	1.3	0.4	2.3	0.7	0.0	2.5	1.7	0.2
Delay (s)	37.0	35.3	33.7	37.8	37.3	28.5	38.6	7.5	8.0	24.1	23.2	24.3
Level of Service	D	D	C	D	D	C	D	A	A	C	C	C
Approach Delay (s)		35.1			34.3			10.1			23.3	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			22.2				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 6th Signalized Intersection Summary





















3: SE Oak Street & OR-224

09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	46	159	82	75	259	182	83	892	16	130	1600	158
Future Volume (veh/h)	46	159	82	75	259	182	83	892	16	130	1600	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	47	162	84	77	264	186	85	910	16	133	1633	161
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	6	6	6
Cap, veh/h	158	538	238	205	538	331	108	2079	926	165	2177	971
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.06	0.60	0.60	0.10	0.63	0.63
Sat Flow, veh/h	914	3469	1532	1100	3469	1512	1739	3469	1546	1725	3441	1534
Grp Volume(v), veh/h	47	162	84	77	264	186	85	910	16	133	1633	161
Grp Sat Flow(s),veh/h/ln	914	1735	1532	1100	1735	1512	1739	1735	1546	1725	1721	1534
Q Serve(g_s), s	4.5	3.7	4.4	6.0	6.3	9.9	4.3	12.8	0.4	6.8	29.9	3.9
Cycle Q Clear(g_c), s	10.7	3.7	4.4	9.7	6.3	9.9	4.3	12.8	0.4	6.8	29.9	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	158	538	238	205	538	331	108	2079	926	165	2177	971
V/C Ratio(X)	0.30	0.30	0.35	0.38	0.49	0.56	0.79	0.44	0.02	0.81	0.75	0.17
Avail Cap(c_a), veh/h	199	694	306	255	694	399	145	2079	926	264	2177	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.93	0.93	0.93	0.43	0.43	0.43
Uniform Delay (d), s/veh	39.7	33.7	34.0	38.0	34.8	31.4	41.6	9.8	7.3	39.9	11.6	6.8
Incr Delay (d2), s/veh	1.0	0.3	0.9	1.1	0.7	1.5	17.0	0.6	0.0	4.1	1.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.6	1.7	1.7	2.7	3.7	2.3	4.3	0.1	3.0	9.4	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	34.0	34.9	39.1	35.5	32.9	58.6	10.4	7.3	44.0	12.6	6.9
LnGrp LOS	D	C	C	D	D	C	E	B	A	D	B	A
Approach Vol, veh/h		293			527			1011			1927	
Approach Delay, s/veh		35.3			35.1			14.4			14.3	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.1	58.4		18.5	10.1	61.4		18.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	13.8	44.7		18.0	7.5	51.0		18.0				
Max Q Clear Time (g_c+I1), s	8.8	14.8		12.7	6.3	31.9		11.9				
Green Ext Time (p_c), s	0.1	6.9		0.7	0.0	12.3		1.5				
Intersection Summary												
HCM 6th Ctrl Delay					18.9							
HCM 6th LOS					B							

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

09/20/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	50	23	59	29	26	7	1757	0	106	914	18
Future Volume (vph)	16	50	23	59	29	26	7	1757	0	106	914	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	550		0	550		80
Storage Lanes	0		0	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00				0.99						
Frt		0.966				0.850						0.850
Flt Protected		0.991			0.968		0.950			0.950		
Satd. Flow (prot)	0	1759	0	0	1735	1524	1719	3438	0	1687	3374	1509
Flt Permitted		0.927			0.710		0.950			0.950		
Satd. Flow (perm)	0	1645	0	0	1273	1503	1719	3438	0	1687	3374	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				73						73
Link Speed (mph)		25			25			50				50
Link Distance (ft)		167			225			581				1978
Travel Time (s)		4.6			6.1			7.9				27.0
Confl. Peds. (#/hr)	1						1					
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	17	53	24	62	31	27	7	1849	0	112	962	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	93	27	7	1849	0	112	962	19
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

09/20/2019

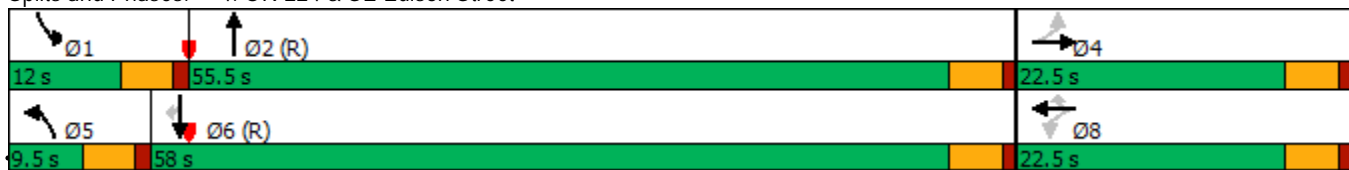


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	55.5		12.0	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%	25.0%	10.6%	61.7%		13.3%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0	18.0	5.0	51.0		7.5	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	0
Act Effct Green (s)		11.0			11.2	11.2	6.0	56.9		10.6	70.6	70.6
Actuated g/C Ratio		0.12			0.12	0.12	0.07	0.63		0.12	0.78	0.78
v/c Ratio		0.44			0.59	0.11	0.06	0.85		0.57	0.36	0.02
Control Delay		35.2			51.7	0.9	40.1	20.5		40.9	10.7	2.1
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		35.2			51.7	0.9	40.1	20.5		40.9	10.7	2.1
LOS		D			D	A	D	C		D	B	A
Approach Delay		35.2			40.3			20.6			13.6	
Approach LOS		D			D			C			B	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 19.4
 Intersection LOS: B
 Intersection Capacity Utilization 77.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 4: OR-224 & SE Edison Street



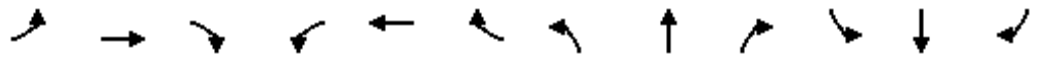
Monroe Apartments 03/07/2019 Existing Conditions - AM Peak Hour
DS

Synchro 10 Report
Page 14

HCM Signalized Intersection Capacity Analysis

4: OR-224 & SE Edison Street

09/20/2019























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↘	↑↑		↘	↑↑	↗
Traffic Volume (vph)	16	50	23	59	29	26	7	1757	0	106	914	18
Future Volume (vph)	16	50	23	59	29	26	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	1.00	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.99	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)		1757			1735	1503	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)		1644			1273	1503	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	27	7	1849	0	112	962	19
RTOR Reduction (vph)	0	15	0	0	0	24	0	0	0	0	0	5
Lane Group Flow (vph)	0	79	0	0	93	3	7	1849	0	112	962	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)		9.9			9.9	9.9	1.4	56.0		10.6	65.2	65.2
Effective Green, g (s)		9.9			9.9	9.9	1.4	56.0		10.6	65.2	65.2
Actuated g/C Ratio		0.11			0.11	0.11	0.02	0.62		0.12	0.72	0.72
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			140	165	26	2139		198	2444	1093
v/s Ratio Prot							0.00	c0.54		c0.07	0.29	
v/s Ratio Perm		0.05			c0.07	0.00						0.01
v/c Ratio		0.44			0.66	0.02	0.27	0.86		0.57	0.39	0.01
Uniform Delay, d1		37.4			38.5	35.7	43.8	13.9		37.5	4.8	3.4
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.78	2.14	1.00
Incremental Delay, d2		1.7			11.3	0.0	5.5	5.0		3.4	0.4	0.0
Delay (s)		39.2			49.7	35.8	49.3	18.9		32.8	10.7	3.5
Level of Service		D			D	D	D	B		C	B	A
Approach Delay (s)		39.2			46.6			19.0			12.8	
Approach LOS		D			D			B			B	

Intersection Summary		
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.80	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	77.3%	13.5
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

HCM 6th Signalized Intersection Summary

4: OR-224 & SE Edison Street

09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	50	23	59	29	26	7	1757	0	106	914	18
Future Volume (veh/h)	16	50	23	59	29	26	7	1757	0	106	914	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1811	1811	1811	1826	1826	0	1796	1796	1796
Adj Flow Rate, veh/h	17	53	24	62	31	27	7	1849	0	112	962	19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	6	6	6	5	5	0	7	7	7
Cap, veh/h	59	90	35	151	58	160	16	2305	0	139	2515	1122
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.01	0.66	0.00	0.08	0.74	0.74
Sat Flow, veh/h	111	861	333	810	560	1530	1739	3561	0	1711	3413	1522
Grp Volume(v), veh/h	94	0	0	93	0	27	7	1849	0	112	962	19
Grp Sat Flow(s),veh/h/ln	1306	0	0	1371	0	1530	1739	1735	0	1711	1706	1522
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	1.4	0.4	34.5	0.0	5.8	9.3	0.3
Cycle Q Clear(g_c), s	6.9	0.0	0.0	5.9	0.0	1.4	0.4	34.5	0.0	5.8	9.3	0.3
Prop In Lane	0.18		0.26	0.67		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	183	0	0	210	0	160	16	2305	0	139	2515	1122
V/C Ratio(X)	0.51	0.00	0.00	0.44	0.00	0.17	0.45	0.80	0.00	0.81	0.38	0.02
Avail Cap(c_a), veh/h	342	0	0	345	0	306	97	2305	0	143	2515	1122
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	38.6	0.0	0.0	38.6	0.0	36.8	44.4	10.8	0.0	40.6	4.3	3.2
Incr Delay (d2), s/veh	2.2	0.0	0.0	1.5	0.0	0.5	19.1	3.1	0.0	24.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	0.0	2.1	0.0	0.6	0.2	10.1	0.0	3.3	2.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.8	0.0	0.0	40.1	0.0	37.3	63.5	13.9	0.0	65.5	4.7	3.2
LnGrp LOS	D	A	A	D	A	D	E	B	A	E	A	A
Approach Vol, veh/h		94			120			1856			1093	
Approach Delay, s/veh		40.8			39.5			14.1			10.9	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.8	64.3		13.9	5.3	70.8		13.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	51.0		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	7.8	36.5		8.9	2.4	11.3		7.9				
Green Ext Time (p_c), s	0.0	10.4		0.3	0.0	7.3		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				14.8								
HCM 6th LOS				B								

Lanes, Volumes, Timings

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

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↖			↕	
Traffic Volume (vph)	42	113	0	0	41	43	0	86	40	114	0	69
Future Volume (vph)	42	113	0	0	41	43	0	86	40	114	0	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		30	0		0	100		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850		0.957				0.949
Flt Protected		0.987										0.970
Satd. Flow (prot)	0	1803	0	0	3167	1417	0	1783	0	0	1732	0
Flt Permitted		0.987										0.970
Satd. Flow (perm)	0	1803	0	0	3167	1417	0	1783	0	0	1732	0
Link Speed (mph)		25			25			35				35
Link Distance (ft)		225			302			180				1370
Travel Time (s)		6.1			8.2			3.5				26.7
Confl. Bikes (#/hr)			2									
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
Heavy Vehicles (%)	4%	4%	4%	14%	14%	14%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	50	135	0	0	49	51	0	102	48	136	0	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	185	0	0	49	51	0	150	0	0	218	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

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

09/20/2019



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	69
Future Volume (vph)	42	113	0	0	41	43	0	86	40	114	0	69
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	82

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	185	25	25	51	150	218
Volume Left (vph)	50	0	0	0	0	136
Volume Right (vph)	0	0	0	51	48	82
Hadj (s)	0.12	0.24	0.24	-0.46	-0.16	-0.08
Departure Headway (s)	5.1	5.8	5.8	3.2	4.6	4.6
Degree Utilization, x	0.26	0.04	0.04	0.05	0.19	0.28
Capacity (veh/h)	660	562	563	1121	729	734
Control Delay (s)	9.9	7.9	7.9	5.2	8.7	9.4
Approach Delay (s)	9.9	6.5			8.7	9.4
Approach LOS	A	A			A	A

Intersection Summary	
Delay	8.9
Level of Service	A
Intersection Capacity Utilization	42.4%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



Lane Group	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
Storage Length (ft)	0		0	110		0	0		80	0		80
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00				0.97		1.00	0.98
Frt		0.993			0.993				0.850			0.850
Flt Protected	0.950			0.950				0.990			0.994	
Satd. Flow (prot)	1656	1731	0	1752	1830	0	0	1826	1568	0	1765	1509
Flt Permitted	0.950			0.950				0.908			0.948	
Satd. Flow (perm)	1650	1731	0	1752	1830	0	0	1675	1524	0	1682	1475
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			4				109			120
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		677			337			235			394	
Travel Time (s)		18.5			9.2			6.4			10.7	
Confl. Peds. (#/hr)	4					4			5	5		
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	9%	9%	9%	3%	3%	3%	3%	3%	3%	7%	7%	7%
Adj. Flow (vph)	110	125	6	22	392	19	37	142	16	16	116	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	110	131	0	22	411	0	0	179	16	0	132	120
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019

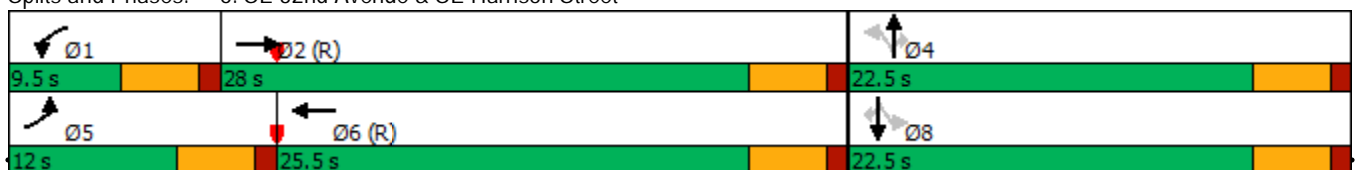


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4		8		8
Permitted Phases							4		4	8		8
Detector Phase	5	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	12.0	28.0		9.5	25.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	20.0%	46.7%		15.8%	42.5%		37.5%	37.5%	37.5%	37.5%	37.5%	37.5%
Maximum Green (s)	7.5	23.5		5.0	21.0		18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effect Green (s)	8.6	37.2		6.2	28.4		11.5	11.5		11.5	11.5	11.5
Actuated g/C Ratio	0.14	0.62		0.10	0.47		0.19	0.19		0.19	0.19	0.19
v/c Ratio	0.46	0.12		0.12	0.47		0.56	0.04		0.41	0.32	0.32
Control Delay	29.8	7.3		25.6	15.6		28.0	0.2		24.1	6.8	6.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	29.8	7.3		25.6	15.6		28.0	0.2		24.1	6.8	6.8
LOS	C	A		C	B		C	A		C	A	A
Approach Delay		17.6			16.1		25.7			15.8		
Approach LOS		B			B		C			B		

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.56
Intersection Signal Delay:	18.0
Intersection LOS:	B
Intersection Capacity Utilization:	55.5%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 6: SE 32nd Avenue & SE Harrison Street



Monroe Apartments 03/07/2019 Existing Conditions - AM Peak Hour
DS

Synchro 10 Report
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HCM Signalized Intersection Capacity Analysis

6: SE 32nd Avenue & SE Harrison Street

09/20/2019



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 (vphp)	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	

Intersection Summary

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			

HCM 6th Signalized Intersection Summary
6: SE 32nd Avenue & SE Harrison Street

09/20/2019













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	116	6	20	365	18	34	132	15	15	108	112
Future Volume (veh/h)	102	116	6	20	365	18	34	132	15	15	108	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1856	1856	1856	1856	1856	1856	1796	1796	1796
Adj Flow Rate, veh/h	110	125	6	22	392	19	37	142	16	16	116	120
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	9	9	9	3	3	3	3	3	3	7	7	7
Cap, veh/h	139	751	36	45	689	33	72	208	468	67	299	443
Arrive On Green	0.08	0.45	0.45	0.03	0.39	0.39	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1682	1672	80	1767	1755	85	0	693	1559	0	995	1476
Grp Volume(v), veh/h	110	0	131	22	0	411	179	0	16	132	0	120
Grp Sat Flow(s),veh/h/ln	1682	0	1752	1767	0	1840	693	0	1559	995	0	1476
Q Serve(g_s), s	3.9	0.0	2.7	0.7	0.0	10.5	0.0	0.0	0.4	0.0	0.0	3.7
Cycle Q Clear(g_c), s	3.9	0.0	2.7	0.7	0.0	10.5	18.0	0.0	0.4	18.0	0.0	3.7
Prop In Lane	1.00		0.05	1.00		0.05	0.21		1.00	0.12		1.00
Lane Grp Cap(c), veh/h	139	0	787	45	0	722	280	0	468	366	0	443
V/C Ratio(X)	0.79	0.00	0.17	0.49	0.00	0.57	0.64	0.00	0.03	0.36	0.00	0.27
Avail Cap(c_a), veh/h	210	0	787	147	0	722	280	0	468	366	0	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.00	0.90	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.0	0.0	9.8	28.8	0.0	14.3	17.3	0.0	14.9	16.4	0.0	16.0
Incr Delay (d2), s/veh	10.2	0.0	0.4	7.9	0.0	3.2	4.8	0.0	0.0	0.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	1.0	0.4	0.0	4.6	2.2	0.0	0.1	1.3	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	0.0	10.2	36.7	0.0	17.5	22.1	0.0	14.9	17.0	0.0	16.3
LnGrp LOS	D	A	B	D	A	B	C	A	B	B	A	B
Approach Vol, veh/h		241			433			195				252
Approach Delay, s/veh		22.5			18.5			21.5				16.7
Approach LOS		C			B			C				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	31.5		22.5	9.4	28.1		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	7.5	21.0		18.0				
Max Q Clear Time (g_c+I1), s	2.7	4.7		20.0	5.9	12.5		20.0				
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	1.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

Lanes, Volumes, Timings
7: SE Oak Street & SE Monroe Street

09/20/2019

						
Lane Group	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (vph)	115	106	55	107	322	69
Future Volume (vph)	115	106	55	107	322	69
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.911			
Flt Protected	0.950					0.960
Satd. Flow (prot)	1719	1538	1664	0	0	1771
Flt Permitted	0.950					0.960
Satd. Flow (perm)	1719	1538	1664	0	0	1771
Link Speed (mph)	25		25			25
Link Distance (ft)	870		163			887
Travel Time (s)	23.7		4.4			24.2
Confl. Peds. (#/hr)	1	2				
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	4%	4%	3%	3%
Adj. Flow (vph)	131	120	63	122	366	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	131	120	185	0	0	444
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: SE Oak Street & SE Monroe Street


















09/20/2019



Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	115	106	55	107	322	69
Future Volume (Veh/h)	115	106	55	107	322	69
Sign Control	Free		Stop		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	131	120	63	122	366	78
Pedestrians			1			2
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					
Median storage (veh)						
Upstream signal (ft)	870					
pX, platoon unblocked						
vC, conflicting volume	1		385	1	418	265
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1		385	1	418	265
tC, single (s)	4.1		6.5	6.2	7.1	6.5
tC, 2 stage (s)						
tF (s)	2.2		4.0	3.3	3.5	4.0
p0 queue free %	92		87	89	10	87
cM capacity (veh/h)	1601		500	1077	407	585
Direction, Lane #	NB 1	NB 2	SE 1	NW 1		
Volume Total	131	120	185	444		
Volume Left	131	0	0	366		
Volume Right	0	120	122	0		
cSH	1601	1700	773	430		
Volume to Capacity	0.08	0.07	0.24	1.03		
Queue Length 95th (ft)	7	0	23	345		
Control Delay (s)	7.4	0.0	11.1	83.3		
Lane LOS	A		B	F		
Approach Delay (s)	3.9		11.1	83.3		
Approach LOS			B	F		
Intersection Summary						
Average Delay			45.5			
Intersection Capacity Utilization			47.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
8: SE 37th Avenue & SE Monroe Street

09/20/2019


















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.942						0.919			0.956	
Flt Protected		0.999			0.990		0.950				0.999	
Satd. Flow (prot)	0	1703	0	0	1826	0	1736	1679	0	0	1728	0
Flt Permitted		0.999			0.990		0.950				0.999	
Satd. Flow (perm)	0	1703	0	0	1826	0	1736	1679	0	0	1728	0
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		887			352			517			331	
Travel Time (s)		24.2			9.6			10.1			9.0	
Confl. Peds. (#/hr)			3	3			3		1	1		3
Confl. Bikes (#/hr)									1			
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
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	4	103	80	62	239	1	161	40	47	1	64	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	187	0	0	302	0	161	87	0	0	96	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.8%
ICU Level of Service	A
Analysis Period (min)	15

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

09/20/2019

												
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 6th AWSC
8: SE 37th Avenue & SE Monroe Street

09/20/2019

Intersection	
Intersection Delay, s/veh	11.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵			↕	
Traffic Vol, veh/h	4	92	71	55	213	1	143	36	42	1	57	28
Future Vol, veh/h	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
Heavy Vehicles, %	5	5	5	3	3	3	4	4	4	5	5	5
Mvmt Flow	4	103	80	62	239	1	161	40	47	1	64	31
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.2	12.5	11	9.7
HCM LOS	B	B	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	2%	20%	1%
Vol Thru, %	0%	46%	55%	79%	66%
Vol Right, %	0%	54%	43%	0%	33%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	143	78	167	269	86
LT Vol	143	0	4	55	1
Through Vol	0	36	92	213	57
RT Vol	0	42	71	1	28
Lane Flow Rate	161	88	188	302	97
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.292	0.137	0.272	0.443	0.152
Departure Headway (Hd)	6.532	5.643	5.209	5.276	5.665
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	551	635	689	683	632
Service Time	4.266	3.377	3.244	3.308	3.708
HCM Lane V/C Ratio	0.292	0.139	0.273	0.442	0.153
HCM Control Delay	12	9.3	10.2	12.5	9.7
HCM Lane LOS	B	A	B	B	A
HCM 95th-tile Q	1.2	0.5	1.1	2.3	0.5

Lanes, Volumes, Timings
 9: SE 37th Avenue & SE Washington Street

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	3	194	3	1	185
Future Volume (vph)	9	3	194	3	1	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.969		0.998			
Flt Protected	0.963					
Satd. Flow (prot)	1773	0	1841	0	0	1900
Flt Permitted	0.963					
Satd. Flow (perm)	1773	0	1841	0	0	1900
Link Speed (mph)	25		35			35
Link Distance (ft)	291		187			517
Travel Time (s)	7.9		3.6			10.1
Confl. Peds. (#/hr)	1			1	1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	3%	3%	0%	0%
Adj. Flow (vph)	10	3	220	3	1	210
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	223	0	0	211
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.5%
ICU Level of Service	A
Analysis Period (min)	15

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

09/20/2019



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	
Direction, Lane #	WB 1	NB 1	SB 1			
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					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			20.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM 6th TWSC
 9: SE 37th Avenue & SE Washington Street

09/20/2019

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WT		PT			PT
Traffic Vol, veh/h	9	3	194	3	1	185
Future Vol, veh/h	9	3	194	3	1	185
Conflicting Peds, #/hr	1	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	3	3	0	0
Mvmt Flow	10	3	220	3	1	210

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	436	223	0	0	224
Stage 1	223	-	-	-	-
Stage 2	213	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	581	822	-	-	1357
Stage 1	819	-	-	-	-
Stage 2	827	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	579	821	-	-	1356
Mov Cap-2 Maneuver	579	-	-	-	-
Stage 1	818	-	-	-	-
Stage 2	825	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	625	1356
HCM Lane V/C Ratio	-	-	0.022	0.001
HCM Control Delay (s)	-	-	10.9	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Lanes, Volumes, Timings
 10: SE 37th Avenue & SE Railroad Avenue

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	147	136	79	29	57	139
Future Volume (vph)	147	136	79	29	57	139
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	30		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.964			
Flt Protected	0.950					0.986
Satd. Flow (prot)	1770	1583	1778	0	0	1819
Flt Permitted	0.950					0.986
Satd. Flow (perm)	1770	1583	1778	0	0	1819
Link Speed (mph)	35		35			35
Link Distance (ft)	419		1370			187
Travel Time (s)	8.2		26.7			3.6
Confl. Peds. (#/hr)		1				
Confl. Bikes (#/hr)		2				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Adj. Flow (vph)	162	149	87	32	63	153
Shared Lane Traffic (%)						
Lane Group Flow (vph)	162	149	119	0	0	216
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

10: SE 37th Avenue & SE Railroad Avenue

09/20/2019



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	
Direction, Lane #	WB 1	NB 1	SB 1			
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					
Intersection Summary						
Average Delay			6.0			
Intersection Capacity Utilization			32.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM 6th TWSC
 10: SE 37th Avenue & SE Railroad Avenue

09/20/2019

Intersection						
Int Delay, s/veh	6.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	147	136	79	29	57	139
Future Vol, veh/h	147	136	79	29	57	139
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	30	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	3	3	3	3
Mvmt Flow	162	149	87	32	63	153

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	382	104	0	0	119	0
Stage 1	103	-	-	-	-	-
Stage 2	279	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.13	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.227	-
Pot Cap-1 Maneuver	620	951	-	-	1463	-
Stage 1	921	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	591	950	-	-	1463	-
Mov Cap-2 Maneuver	591	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	732	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	2.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	591	950	1463
HCM Lane V/C Ratio	-	-	0.273	0.157	0.043
HCM Control Delay (s)	-	-	13.4	9.5	7.6
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.6	0.1

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019



Lane Group	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	
Storage Length (ft)	0		200	0		200	170		200	640		160	
Storage Lanes	0		1	0		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Ped Bike Factor		1.00			0.99		1.00		0.99	1.00		0.99	
Frt		0.974			0.940				0.850			0.850	
Flt Protected		0.999			0.993		0.950			0.950			
Satd. Flow (prot)	0	3333	0	0	3213	0	1752	3505	1568	1752	3505	1568	
Flt Permitted		0.947			0.745		0.950			0.950			
Satd. Flow (perm)	0	3159	0	0	2410	0	1752	3505	1545	1752	3505	1547	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		25			155				127			73	
Link Speed (mph)		25			25			40				40	
Link Distance (ft)		532			677			514				440	
Travel Time (s)		14.5			18.5			8.8				7.5	
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1	
Confl. Bikes (#/hr)			3						2				
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%	
Adj. Flow (vph)	5	261	57	56	184	158	63	1477	67	288	1764	31	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	323	0	0	398	0	63	1477	67	288	1764	31	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		0			0			12				12	
Link Offset(ft)		0			0			0				0	
Crosswalk Width(ft)		16			16			16				16	
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15		9	15		9	15		9	15		9	
Number of Detectors	1	2		1	2		1	2	1	1	2	1	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel													
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94				94	
Detector 2 Size(ft)		6			6			6				6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex	
Detector 2 Channel													

Lanes, Volumes, Timings

1: OR-224 & SE Harrison Street

09/20/2019

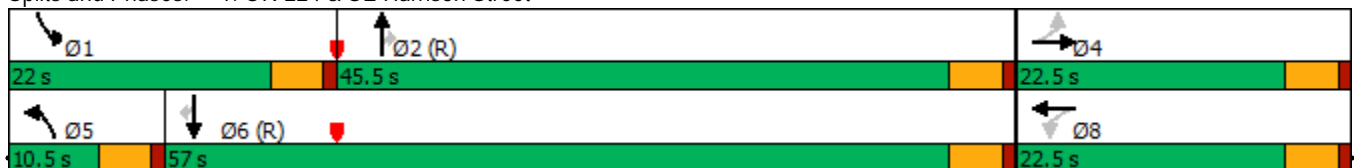


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		10.5	45.5	45.5	22.0	57.0	57.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		11.7%	50.6%	50.6%	24.4%	63.3%	63.3%
Maximum Green (s)	18.0	18.0		18.0	18.0		6.0	41.0	41.0	17.5	52.5	52.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)		14.2			14.2		6.9	44.3	44.3	18.0	57.4	57.4
Actuated g/C Ratio		0.16			0.16		0.08	0.49	0.49	0.20	0.64	0.64
v/c Ratio		0.62			0.78		0.47	0.86	0.08	0.82	0.79	0.03
Control Delay		37.5			32.7		44.9	24.8	2.3	55.2	16.9	0.2
Queue Delay		0.0			0.0		0.0	0.2	0.0	0.0	0.2	0.0
Total Delay		37.5			32.7		44.9	24.9	2.3	55.2	17.1	0.2
LOS		D			C		D	C	A	E	B	A
Approach Delay		37.5			32.7			24.8			22.1	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 25.2
 Intersection LOS: C
 Intersection Capacity Utilization 92.0%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 1: OR-224 & SE Harrison Street























Monroe Apartments 03/07/2019 Existing Conditions - PM Peak Hour
 DS

Synchro 10 Report
 Page 2

HCM Signalized Intersection Capacity Analysis

1: OR-224 & SE Harrison Street

09/20/2019

												
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 (vphp)	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	8.89	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	105.5	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	
Intersection Summary												
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 6th Signalized Intersection Summary

1: OR-224 & SE Harrison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↕↕	↗	↗	↕↕	↗
Traffic Volume (veh/h)	5	253	55	54	178	153	61	1433	65	279	1711	30
Future Volume (veh/h)	5	253	55	54	178	153	61	1433	65	279	1711	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	261	57	56	184	158	63	1477	67	288	1764	31
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	3	3	3	3	3	3
Cap, veh/h	44	535	113	96	245	230	81	1669	734	322	2151	959
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.05	0.47	0.47	0.18	0.61	0.61
Sat Flow, veh/h	15	2755	583	229	1263	1182	1767	3526	1551	1767	3526	1572
Grp Volume(v), veh/h	173	0	150	204	0	194	63	1477	67	288	1764	31
Grp Sat Flow(s),veh/h/ln	1814	0	1539	1225	0	1449	1767	1763	1551	1767	1763	1572
Q Serve(g_s), s	0.0	0.0	7.9	7.3	0.0	11.2	3.2	34.2	2.1	14.3	35.1	0.7
Cycle Q Clear(g_c), s	7.6	0.0	7.9	15.2	0.0	11.2	3.2	34.2	2.1	14.3	35.1	0.7
Prop In Lane	0.03		0.38	0.27		0.82	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	393	0	299	289	0	282	81	1669	734	322	2151	959
V/C Ratio(X)	0.44	0.00	0.50	0.71	0.00	0.69	0.78	0.89	0.09	0.89	0.82	0.03
Avail Cap(c_a), veh/h	404	0	308	298	0	290	118	1669	734	344	2151	959
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.95	0.00	0.95	0.76	0.76	0.76	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	0.0	32.4	35.6	0.0	33.7	42.5	21.5	13.0	35.9	13.7	7.0
Incr Delay (d2), s/veh	0.8	0.0	1.3	6.9	0.0	6.2	14.3	5.7	0.2	23.4	3.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	3.0	4.9	0.0	4.4	1.7	13.8	0.7	8.0	12.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	0.0	33.7	42.5	0.0	39.9	56.8	27.2	13.2	59.3	17.3	7.0
LnGrp LOS	C	A	C	D	A	D	E	C	B	E	B	A
Approach Vol, veh/h		323			398			1607			2083	
Approach Delay, s/veh		33.3			41.2			27.8			23.0	
Approach LOS		C			D			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.9	47.1		22.0	8.6	59.4		22.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	17.5	41.0		18.0	6.0	52.5		18.0				
Max Q Clear Time (g_c+I1), s	16.3	36.2		9.9	5.2	37.1		17.2				
Green Ext Time (p_c), s	0.1	3.7		1.2	0.0	10.9		0.2				

Intersection Summary

HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C

Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	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
Storage Length (ft)	0		0	0		0	240		260	150		250
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			0.99		1.00					0.97
Frt		0.921			0.949				0.850			0.850
Flt Protected		0.990			0.987		0.950			0.950		
Satd. Flow (prot)	0	1666	0	0	1771	0	1752	3505	1568	1752	3505	1568
Flt Permitted		0.936			0.830		0.950			0.950		
Satd. Flow (perm)	0	1574	0	0	1488	0	1751	3505	1568	1752	3505	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71			21				73			73
Link Speed (mph)		25			25			40				40
Link Distance (ft)		550			530			831				514
Travel Time (s)		15.0			14.5			14.2				8.8
Confl. Peds. (#/hr)	1		3	3		1	4					4
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	28	30	82	15	20	21	32	1573	13	22	1841	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	140	0	0	56	0	32	1573	13	22	1841	24
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		9.5	57.6	57.6	9.9	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		10.6%	64.0%	64.0%	11.0%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0		5.0	53.1	53.1	5.4	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effect Green (s)		9.8			9.8		6.9	66.3	66.3	6.7	63.9	63.9
Actuated g/C Ratio		0.11			0.11		0.08	0.74	0.74	0.07	0.71	0.71
v/c Ratio		0.60			0.31		0.24	0.61	0.01	0.17	0.74	0.02
Control Delay		30.1			29.1		41.1	5.6	0.0	53.7	4.7	0.0
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.2	0.0
Total Delay		30.2			29.1		41.1	5.6	0.0	53.7	4.9	0.0
LOS		C			C		D	A	A	D	A	A
Approach Delay		30.2			29.1			6.3			5.4	
Approach LOS		C			C			A			A	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	7.1
Intersection LOS:	A
Intersection Capacity Utilization:	67.1%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 2: OR-224 & SE Monroe Street



HCM Signalized Intersection Capacity Analysis

2: OR-224 & SE Monroe Street

09/20/2019



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		0.99	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		42.4	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	
Intersection Summary												
HCM 2000 Control Delay			7.0									A
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			90.0								13.5	
Intersection Capacity Utilization			67.1%									C
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th Signalized Intersection Summary
 2: OR-224 & SE Monroe Street

09/20/2019



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↕↕	↗	↗	↗	↕↕
Traffic Volume (veh/h)	27	29	80	15	19	20	31	1526	13	21	1786	23
Future Volume (veh/h)	27	29	80	15	19	20	31	1526	13	21	1786	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1900	1900	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	30	82	15	20	21	32	1573	13	22	1841	24
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	0	0	0	3	3	3	3	3	3
Cap, veh/h	73	52	109	82	96	77	54	2501	1113	42	2476	1101
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.03	0.71	0.71	0.05	1.00	1.00
Sat Flow, veh/h	215	447	936	270	825	657	1767	3526	1568	1767	3526	1568
Grp Volume(v), veh/h	140	0	0	56	0	0	32	1573	13	22	1841	24
Grp Sat Flow(s),veh/h/ln	1597	0	0	1752	0	0	1767	1763	1568	1767	1763	1568
Q Serve(g_s), s	4.3	0.0	0.0	0.0	0.0	0.0	1.6	21.1	0.2	1.1	0.0	0.0
Cycle Q Clear(g_c), s	7.6	0.0	0.0	2.6	0.0	0.0	1.6	21.1	0.2	1.1	0.0	0.0
Prop In Lane	0.20		0.59	0.27		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	235	0	0	256	0	0	54	2501	1113	42	2476	1101
V/C Ratio(X)	0.60	0.00	0.00	0.22	0.00	0.00	0.59	0.63	0.01	0.53	0.74	0.02
Avail Cap(c_a), veh/h	365	0	0	388	0	0	98	2501	1113	106	2476	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.56	0.56	0.56	0.52	0.52	0.52
Uniform Delay (d), s/veh	38.4	0.0	0.0	36.2	0.0	0.0	43.1	6.9	3.8	42.4	0.0	0.0
Incr Delay (d2), s/veh	2.4	0.0	0.0	0.4	0.0	0.0	5.7	0.7	0.0	5.3	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	0.0	1.2	0.0	0.0	0.8	5.8	0.1	0.5	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.8	0.0	0.0	36.7	0.0	0.0	48.7	7.5	3.8	47.7	1.1	0.0
LnGrp LOS	D	A	A	D	A	A	D	A	A	D	A	A
Approach Vol, veh/h		140			56			1618			1887	
Approach Delay, s/veh		40.8			36.7			8.3			1.6	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	68.4		15.0	7.3	67.7		15.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.4	53.1		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	3.1	23.1		9.6	3.6	2.0		4.6				
Green Ext Time (p_c), s	0.0	14.6		0.4	0.0	24.0		0.2				

Intersection Summary

HCM 6th Ctrl Delay	6.6
HCM 6th LOS	A

Lanes, Volumes, Timings
3: SE Oak Street & OR-224

09/20/2019

												
Lane Group	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
Storage Length (ft)	80		80	180		180	400		250	540		150
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
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
Ped Bike Factor	1.00		0.97	0.99		0.98	1.00		0.99	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	1752	3505	1568	1752	3505	1568	1770	3539	1583
Flt Permitted	0.544			0.597			0.950			0.950		
Satd. Flow (perm)	991	3471	1506	1089	3505	1542	1750	3505	1547	1769	3539	1531
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			18			73			127
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		181			870			831			1978	
Travel Time (s)		4.9			23.7			14.2			33.7	
Confl. Peds. (#/hr)	3		10	10		3	5		1	1		5
Confl. Bikes (#/hr)			3									1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	27	213	83	131	246	141	230	1756	54	105	1524	175
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	213	83	131	246	141	230	1756	54	105	1524	175
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: SE Oak Street & OR-224

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Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
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
Detector Phase	4	4	4	8	8	5	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	19.0	19.0	55.5	55.5	12.0	48.5	48.5
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	21.1%	21.1%	61.7%	61.7%	13.3%	53.9%	53.9%
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0	14.5	14.5	51.0	51.0	7.5	44.0	44.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	0
Act Effect Green (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
v/c Ratio	0.17	0.38	0.24	0.74	0.43	0.27	0.81	0.84	0.06	0.65	0.82	0.20
Control Delay	33.2	34.7	3.7	60.1	35.6	17.2	56.4	14.6	3.3	45.6	28.2	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	34.7	3.7	60.1	35.6	17.2	56.4	14.6	3.3	45.6	28.2	11.9
LOS	C	C	A	E	D	B	E	B	A	D	C	B
Approach Delay		26.6			36.8			19.0			27.6	
Approach LOS		C			D			B			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 24.8
 Intersection LOS: C
 Intersection Capacity Utilization 81.0%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 3: SE Oak Street & OR-224



























Monroe Apartments 03/07/2019 Existing Conditions - PM Peak Hour
DS

Synchro 10 Report
Page 10

HCM Signalized Intersection Capacity Analysis

3: SE Oak Street & OR-224

























09/20/2019

												
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 (vphp)	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
Frbp, 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	2.62
Incremental Delay, d2	0.5	0.4	0.1	15.6	0.5	0.2	11.2	3.2	0.1	6.8	3.4	0.3
Delay (s)	33.0	34.1	32.0	51.5	34.5	22.2	50.3	13.3	16.7	34.7	26.4	29.1
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	
Intersection Summary												
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 6th Signalized Intersection Summary

3: SE Oak Street & OR-224

09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	25	198	77	122	229	131	214	1633	50	98	1417	163
Future Volume (veh/h)	25	198	77	122	229	131	214	1633	50	98	1417	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1856	1856	1856	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	27	213	83	131	246	141	230	1756	54	105	1524	175
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	3	3	3	3	3	3	2	2	2
Cap, veh/h	213	689	298	234	694	540	265	2040	906	133	1789	786
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.15	0.58	0.58	0.07	0.50	0.50
Sat Flow, veh/h	973	3497	1513	1065	3526	1549	1767	3526	1566	1781	3554	1561
Grp Volume(v), veh/h	27	213	83	131	246	141	230	1756	54	105	1524	175
Grp Sat Flow(s),veh/h/ln	973	1749	1513	1065	1763	1549	1767	1763	1566	1781	1777	1561
Q Serve(g_s), s	2.2	4.7	4.2	10.8	5.4	5.9	11.4	37.6	1.4	5.2	33.6	5.6
Cycle Q Clear(g_c), s	7.6	4.7	4.2	15.5	5.4	5.9	11.4	37.6	1.4	5.2	33.6	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	213	689	298	234	694	540	265	2040	906	133	1789	786
V/C Ratio(X)	0.13	0.31	0.28	0.56	0.35	0.26	0.87	0.86	0.06	0.79	0.85	0.22
Avail Cap(c_a), veh/h	216	699	303	238	705	545	285	2040	906	148	1789	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.59	0.59	0.59	0.69	0.69	0.69
Uniform Delay (d), s/veh	34.5	30.9	30.7	37.5	31.2	21.1	37.4	15.9	8.3	41.0	19.4	12.5
Incr Delay (d2), s/veh	0.3	0.3	0.5	2.9	0.3	0.3	14.9	3.1	0.1	16.4	3.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.0	1.6	3.0	2.3	2.2	5.8	13.5	0.4	2.8	13.1	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	31.2	31.2	40.4	31.5	21.4	52.3	19.0	8.3	57.4	23.2	13.0
LnGrp LOS	C	C	C	D	C	C	D	B	A	E	C	B
Approach Vol, veh/h		323			518			2040			1804	
Approach Delay, s/veh		31.5			31.0			22.5			24.2	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.2	56.6		22.2	18.0	49.8		22.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	51.0		18.0	14.5	44.0		18.0				
Max Q Clear Time (g_c+I1), s	7.2	39.6		9.6	13.4	35.6		17.5				
Green Ext Time (p_c), s	0.0	8.6		1.1	0.1	6.2		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				24.7								
HCM 6th LOS				C								

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕		↖	↕	↗
Traffic Volume (vph)	17	82	13	101	63	95	29	1445	0	68	1753	18
Future Volume (vph)	17	82	13	101	63	95	29	1445	0	68	1753	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	550		0	550		80
Storage Lanes	0		0	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00	0.99				1.00		
Frt		0.984				0.850						0.850
Flt Protected		0.992			0.970		0.950			0.950		
Satd. Flow (prot)	0	1833	0	0	1825	1599	1770	3539	0	1736	3471	1553
Flt Permitted		0.937			0.695		0.950			0.950		
Satd. Flow (perm)	0	1732	0	0	1307	1578	1770	3539	0	1735	3471	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				101						73
Link Speed (mph)		25			25			50				50
Link Distance (ft)		167			225			581				1978
Travel Time (s)		4.6			6.1			7.9				27.0
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)						1			1			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	18	87	14	107	67	101	31	1537	0	72	1865	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	119	0	0	174	101	31	1537	0	72	1865	19
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings

4: OR-224 & SE Edison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
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
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	56.5		11.0	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%	25.0%	10.6%	62.8%		12.2%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0	18.0	5.0	52.0		6.5	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	0
Act Effct Green (s)		15.5			15.5	15.5	5.5	56.3		6.8	59.6	59.6
Actuated g/C Ratio		0.17			0.17	0.17	0.06	0.63		0.08	0.66	0.66
v/c Ratio		0.39			0.78	0.29	0.29	0.69		0.55	0.81	0.02
Control Delay		34.2			58.6	8.8	47.7	14.6		44.9	14.5	0.3
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		34.2			58.6	8.8	47.7	14.6		44.9	14.5	0.3
LOS		C			E	A	D	B		D	B	A
Approach Delay		34.2			40.3			15.3			15.5	
Approach LOS		C			D			B			B	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	17.7
Intersection LOS:	B
Intersection Capacity Utilization	79.4%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 4: OR-224 & SE Edison Street



Monroe Apartments 03/07/2019 Existing Conditions - PM Peak Hour
DS

Synchro 10 Report
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HCM Signalized Intersection Capacity Analysis

4: OR-224 & SE Edison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕		↖	↕	↗
Traffic Volume (vph)	17	82	13	101	63	95	29	1445	0	68	1753	18
Future Volume (vph)	17	82	13	101	63	95	29	1445	0	68	1753	18
Ideal Flow (vphp)	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	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.99	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	1578	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	1578	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	101	31	1537	0	72	1865	19
RTOR Reduction (vph)	0	6	0	0	0	84	0	0	0	0	0	7
Lane Group Flow (vph)	0	113	0	0	174	17	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	271	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	0.06	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			43.6			14.5			14.7	
Approach LOS		C			D			B			B	

Intersection Summary		
HCM 2000 Control Delay	17.2	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 6th Signalized Intersection Summary
 4: OR-224 & SE Edison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↑↑		↘	↑↑	↗
Traffic Volume (veh/h)	17	82	13	101	63	95	29	1445	0	68	1753	18
Future Volume (veh/h)	17	82	13	101	63	95	29	1445	0	68	1753	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1870	1870	0	1841	1841	1841
Adj Flow Rate, veh/h	18	87	14	107	67	101	31	1537	0	72	1865	19
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	0	4	4	4
Cap, veh/h	46	157	21	150	74	315	53	2123	0	92	2169	966
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.03	0.60	0.00	0.05	0.62	0.62
Sat Flow, veh/h	0	783	104	425	372	1574	1781	3647	0	1753	3497	1559
Grp Volume(v), veh/h	119	0	0	174	0	101	31	1537	0	72	1865	19
Grp Sat Flow(s),veh/h/ln	888	0	0	797	0	1574	1781	1777	0	1753	1749	1559
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	4.9	1.5	27.6	0.0	3.7	39.1	0.4
Cycle Q Clear(g_c), s	18.0	0.0	0.0	18.0	0.0	4.9	1.5	27.6	0.0	3.7	39.1	0.4
Prop In Lane	0.15		0.12	0.61		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	224	0	0	224	0	315	53	2123	0	92	2169	966
V/C Ratio(X)	0.53	0.00	0.00	0.78	0.00	0.32	0.58	0.72	0.00	0.78	0.86	0.02
Avail Cap(c_a), veh/h	224	0	0	224	0	315	99	2123	0	127	2169	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.48	0.48	0.48
Uniform Delay (d), s/veh	31.3	0.0	0.0	36.1	0.0	30.8	43.1	12.8	0.0	42.1	13.9	6.6
Incr Delay (d2), s/veh	2.4	0.0	0.0	15.7	0.0	0.6	9.6	2.2	0.0	9.9	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	4.8	0.0	1.9	0.8	9.2	0.0	1.7	12.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	0.0	0.0	51.8	0.0	31.4	52.7	15.0	0.0	52.0	16.3	6.6
LnGrp LOS	C	A	A	D	A	C	D	B	A	D	B	A
Approach Vol, veh/h		119			275			1568			1956	
Approach Delay, s/veh		33.7			44.3			15.8			17.5	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	58.3		22.5	7.2	60.3		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.5	52.0		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	5.7	29.6		20.0	3.5	41.1		20.0				
Green Ext Time (p_c), s	0.0	11.4		0.0	0.0	9.3		0.0				

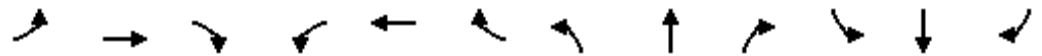
Intersection Summary

HCM 6th Ctrl Delay	19.2
HCM 6th LOS	B

Lanes, Volumes, Timings

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

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↖			↕	
Traffic Volume (vph)	125	31	0	0	165	212	0	124	13	47	0	82
Future Volume (vph)	125	31	0	0	165	212	0	124	13	47	0	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		30	0		0	100		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Fr _t						0.850		0.987				0.914
Fl _t Protected		0.961										0.982
Satd. Flow (prot)	0	1773	0	0	3505	1568	0	1839	0	0	1705	0
Fl _t Permitted		0.961										0.982
Satd. Flow (perm)	0	1773	0	0	3505	1568	0	1839	0	0	1705	0
Link Speed (mph)		25			25			35				35
Link Distance (ft)		225			302			180				1370
Travel Time (s)		6.1			8.2			3.5				26.7
Confl. Peds. (#/hr)	1						1					
Confl. Bikes (#/hr)							3					
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	137	34	0	0	181	233	0	136	14	52	0	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	171	0	0	181	233	0	150	0	0	142	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Stop			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.7%
ICU Level of Service	A
Analysis Period (min)	15

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

09/20/2019



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	82
Future Volume (vph)	125	31	0	0	165	212	0	124	13	47	0	82
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	90

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	171	91	91	233	150	142
Volume Left (vph)	137	0	0	0	0	52
Volume Right (vph)	0	0	0	233	14	90
Hadj (s)	0.21	0.05	0.05	-0.65	-0.02	-0.31
Departure Headway (s)	5.2	5.5	5.5	3.2	5.0	4.7
Degree Utilization, x	0.25	0.14	0.14	0.21	0.21	0.19
Capacity (veh/h)	646	615	617	1122	670	699
Control Delay (s)	9.9	8.2	8.2	5.8	9.3	8.8
Approach Delay (s)	9.9	6.9			9.3	8.8
Approach LOS	A	A			A	A

Intersection Summary	
Delay	8.2
Level of Service	A
Intersection Capacity Utilization	41.7% ICU Level of Service A
Analysis Period (min)	15

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



Lane Group	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
Storage Length (ft)	0		0	110		0	0		80	0		80
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00				0.95		0.99	
Frt		0.999			0.990				0.850			0.850
Flt Protected	0.950			0.950				0.990			0.988	
Satd. Flow (prot)	1736	1825	0	1736	1804	0	0	1862	1599	0	1823	1568
Flt Permitted	0.950			0.950				0.902			0.874	
Satd. Flow (perm)	1714	1825	0	1736	1804	0	0	1697	1513	0	1602	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			6				109			134
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		677			337			235			394	
Travel Time (s)		18.5			9.2			6.4			10.7	
Confl. Peds. (#/hr)	11					11			20	20		
Confl. Bikes (#/hr)			1						1			
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	138	463	3	32	267	19	34	140	33	54	160	134
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	466	0	32	286	0	0	174	33	0	214	134
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019

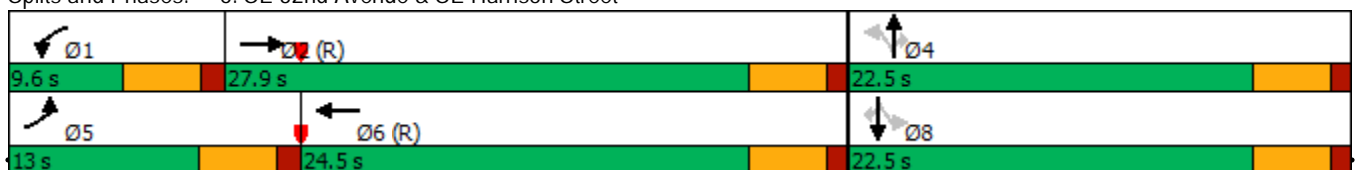


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4		8		8
Permitted Phases							4		4	8		8
Detector Phase	5	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	13.0	27.9		9.6	24.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	21.7%	46.5%		16.0%	40.8%		37.5%	37.5%	37.5%	37.5%	37.5%	37.5%
Maximum Green (s)	8.5	23.4		5.1	20.0		18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effect Green (s)	8.8	33.5		6.0	26.7			13.2	13.2		13.2	13.2
Actuated g/C Ratio	0.15	0.56		0.10	0.44			0.22	0.22		0.22	0.22
v/c Ratio	0.55	0.46		0.18	0.36			0.47	0.08		0.61	0.30
Control Delay	32.6	12.5		27.6	15.1			23.5	0.4		27.9	5.6
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	32.6	12.5		27.6	15.1			23.5	0.4		27.9	5.6
LOS	C	B		C	B			C	A		C	A
Approach Delay		17.1			16.4			19.8			19.3	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.61
Intersection Signal Delay:	17.9
Intersection LOS:	B
Intersection Capacity Utilization:	63.2%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 6: SE 32nd Avenue & SE Harrison Street



Monroe Apartments 03/07/2019 Existing Conditions - PM Peak Hour
DS

Synchro 10 Report
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HCM Signalized Intersection Capacity Analysis
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



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

HCM 6th Signalized Intersection Summary
6: SE 32nd Avenue & SE Harrison Street











09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	417	3	29	240	17	31	126	30	49	144	121
Future Volume (veh/h)	124	417	3	29	240	17	31	126	30	49	144	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.99		0.95	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1885	1885	1885	1856	1856	1856
Adj Flow Rate, veh/h	138	463	3	32	267	19	34	140	33	54	160	134
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
Percent Heavy Veh, %	4	4	4	4	4	4	1	1	1	3	3	3
Cap, veh/h	175	805	5	60	636	45	72	222	453	75	170	456
Arrive On Green	0.10	0.44	0.44	0.03	0.37	0.37	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1753	1826	12	1753	1696	121	0	741	1512	0	566	1520
Grp Volume(v), veh/h	138	0	466	32	0	286	174	0	33	214	0	134
Grp Sat Flow(s),veh/h/ln	1753	0	1838	1753	0	1817	741	0	1512	566	0	1520
Q Serve(g_s), s	4.6	0.0	11.4	1.1	0.0	7.0	0.0	0.0	0.9	0.0	0.0	4.1
Cycle Q Clear(g_c), s	4.6	0.0	11.4	1.1	0.0	7.0	18.0	0.0	0.9	18.0	0.0	4.1
Prop In Lane	1.00		0.01	1.00		0.07	0.20		1.00	0.25		1.00
Lane Grp Cap(c), veh/h	175	0	810	60	0	681	294	0	453	245	0	456
V/C Ratio(X)	0.79	0.00	0.58	0.53	0.00	0.42	0.59	0.00	0.07	0.87	0.00	0.29
Avail Cap(c_a), veh/h	248	0	810	149	0	681	294	0	453	245	0	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.00	0.71	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.4	0.0	12.6	28.5	0.0	13.9	17.2	0.0	15.0	17.9	0.0	16.1
Incr Delay (d2), s/veh	7.5	0.0	2.1	7.0	0.0	1.9	3.1	0.0	0.1	27.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	4.6	0.6	0.0	3.0	2.0	0.0	0.3	4.0	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	0.0	14.7	35.5	0.0	15.8	20.3	0.0	15.1	45.3	0.0	16.5
LnGrp LOS	C	A	B	D	A	B	C	A	B	D	A	B
Approach Vol, veh/h		604			318			207				348
Approach Delay, s/veh		19.1			17.8			19.5				34.2
Approach LOS		B			B			B				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	30.9		22.5	10.5	27.0		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	23.4		18.0	8.5	20.0		18.0				
Max Q Clear Time (g_c+I1), s	3.1	13.4		20.0	6.6	9.0		20.0				
Green Ext Time (p_c), s	0.0	2.2		0.0	0.1	1.3		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				22.4								
HCM 6th LOS				C								

Lanes, Volumes, Timings
7: SE Oak Street & SE Monroe Street

09/20/2019

						
Lane Group	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (vph)	137	326	122	142	212	46
Future Volume (vph)	137	326	122	142	212	46
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.928			
Flt Protected	0.950					0.961
Satd. Flow (prot)	1787	1599	1729	0	0	1790
Flt Permitted	0.950					0.961
Satd. Flow (perm)	1787	1599	1729	0	0	1790
Link Speed (mph)	25		25			25
Link Distance (ft)	870		163			887
Travel Time (s)	23.7		4.4			24.2
Confl. Peds. (#/hr)	4	7		2	2	
Confl. Bikes (#/hr)		5		4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%
Adj. Flow (vph)	149	354	133	154	230	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	149	354	287	0	0	280
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	48.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: SE Oak Street & SE Monroe Street


















09/20/2019



Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	137	326	122	142	212	46
Future Volume (Veh/h)	137	326	122	142	212	46
Sign Control	Free		Stop		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	149	354	133	154	230	50
Pedestrians	2		4		7	
Lane Width (ft)	12.0		12.0		12.0	
Walking Speed (ft/s)	3.5		3.5		3.5	
Percent Blockage	0		0		1	
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)	870					
pX, platoon unblocked						
vC, conflicting volume	4		663	6	528	309
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4		663	6	528	309
tC, single (s)	4.1		6.5	6.2	7.1	6.5
tC, 2 stage (s)						
tF (s)	2.2		4.0	3.3	3.5	4.0
p0 queue free %	91		61	86	9	91
cM capacity (veh/h)	1618		343	1071	254	544
Direction, Lane #	NB 1	NB 2	SE 1	NW 1		
Volume Total	149	354	287	280		
Volume Left	149	0	0	230		
Volume Right	0	354	154	0		
cSH	1618	1700	540	280		
Volume to Capacity	0.09	0.21	0.53	1.00		
Queue Length 95th (ft)	8	0	78	256		
Control Delay (s)	7.5	0.0	19.0	93.6		
Lane LOS	A		C	F		
Approach Delay (s)	2.2		19.0	93.6		
Approach LOS			C	F		
Intersection Summary						
Average Delay			30.6			
Intersection Capacity Utilization			48.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
8: SE 37th Avenue & SE Monroe Street

09/20/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.954			0.996			0.896			0.986	
Flt Protected		0.998			0.986		0.950				0.997	
Satd. Flow (prot)	0	1774	0	0	1829	0	1787	1686	0	0	1813	0
Flt Permitted		0.998			0.986		0.950				0.997	
Satd. Flow (perm)	0	1774	0	0	1829	0	1787	1686	0	0	1813	0
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		887			352			518			331	
Travel Time (s)		24.2			9.6			10.1			9.0	
Confl. Peds. (#/hr)	6		2	2		6			4	4		
Confl. Bikes (#/hr)			2			1			3			
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	16	301	164	64	156	7	99	94	211	6	71	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	481	0	0	227	0	99	305	0	0	86	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	


















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.1%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

8: SE 37th Avenue & SE Monroe Street

09/20/2019

												
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 6th AWSC
8: SE 37th Avenue & SE Monroe Street

09/20/2019

Intersection	
Intersection Delay, s/veh	18.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵			↕	
Traffic Vol, veh/h	14	271	148	58	140	6	89	85	190	5	64	8
Future Vol, veh/h	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
Heavy Vehicles, %	2	2	2	2	2	2	1	1	1	3	3	3
Mvmt Flow	16	301	164	64	156	7	99	94	211	6	71	9
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	24.8	13.7	15.1	11.6
HCM LOS	C	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	3%	28%	6%
Vol Thru, %	0%	31%	63%	69%	83%
Vol Right, %	0%	69%	34%	3%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	89	275	433	204	77
LT Vol	89	0	14	58	5
Through Vol	0	85	271	140	64
RT Vol	0	190	148	6	8
Lane Flow Rate	99	306	481	227	86
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.201	0.537	0.764	0.403	0.168
Departure Headway (Hd)	7.332	6.327	5.714	6.397	7.066
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	490	571	635	562	506
Service Time	5.058	4.053	3.731	4.442	5.127
HCM Lane V/C Ratio	0.202	0.536	0.757	0.404	0.17
HCM Control Delay	11.9	16.2	24.8	13.7	11.6
HCM Lane LOS	B	C	C	B	B
HCM 95th-tile Q	0.7	3.2	7	1.9	0.6

Lanes, Volumes, Timings
 9: SE 37th Avenue & SE Washington Street

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	1	340	8	2	241
Future Volume (vph)	3	1	340	8	2	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.966		0.997			
Flt Protected	0.964					
Satd. Flow (prot)	1769	0	1876	0	0	1863
Flt Permitted	0.964					
Satd. Flow (perm)	1769	0	1876	0	0	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	295		186			518
Travel Time (s)	8.0		3.6			10.1
Confl. Peds. (#/hr)	6	1		1	1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	1%	1%	2%	2%
Adj. Flow (vph)	3	1	374	9	2	265
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	383	0	0	267
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.7%
Analysis Period (min)	15
	ICU Level of Service A

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

09/20/2019



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	
Direction, Lane #	WB 1	NB 1	SB 1			
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					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			28.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM 6th TWSC
 9: SE 37th Avenue & SE Washington Street

09/20/2019

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	3	1	340	8	2	241
Future Vol, veh/h	3	1	340	8	2	241
Conflicting Peds, #/hr	6	1	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	3	1	374	9	2	265

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	655	381	0	0	384
Stage 1	380	-	-	-	-
Stage 2	275	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218
Pot Cap-1 Maneuver	434	671	-	-	1174
Stage 1	696	-	-	-	-
Stage 2	776	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	430	670	-	-	1173
Mov Cap-2 Maneuver	430	-	-	-	-
Stage 1	695	-	-	-	-
Stage 2	770	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	472	1173
HCM Lane V/C Ratio	-	-	0.009	0.002
HCM Control Delay (s)	-	-	12.7	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Lanes, Volumes, Timings
 10: SE 37th Avenue & SE Railroad Avenue

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	99	93	284	174	154	121
Future Volume (vph)	99	93	284	174	154	121
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	30		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.949			
Flt Protected	0.950					0.973
Satd. Flow (prot)	1787	1599	1785	0	0	1812
Flt Permitted	0.950					0.973
Satd. Flow (perm)	1787	1599	1785	0	0	1812
Link Speed (mph)	35		35			35
Link Distance (ft)	419		1370			186
Travel Time (s)	8.2		26.7			3.6
Confl. Peds. (#/hr)		2				
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%
Adj. Flow (vph)	113	106	323	198	175	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	113	106	521	0	0	313
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	56.4%
	ICU Level of Service B
Analysis Period (min)	15

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

09/20/2019



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	
Direction, Lane #	WB 1	NB 1	SB 1			
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					
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			56.4%		ICU Level of Service	B
Analysis Period (min)			15			

HCM 6th TWSC
10: SE 37th Avenue & SE Railroad Avenue

09/20/2019

Intersection						
Int Delay, s/veh	6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	99	93	284	174	154	121
Future Vol, veh/h	99	93	284	174	154	121
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	30	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	113	106	323	198	175	138





















Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	910	424	0	0	521	0
Stage 1	422	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.12	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.218	-
Pot Cap-1 Maneuver	306	632	-	-	1045	-
Stage 1	664	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	251	631	-	-	1045	-
Mov Cap-2 Maneuver	251	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	507	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.4	0	5.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	251	631	1045	-
HCM Lane V/C Ratio	-	-	0.448	0.167	0.167	-
HCM Control Delay (s)	-	-	30.5	11.8	9.1	0
HCM Lane LOS	-	-	D	B	A	A
HCM 95th %tile Q(veh)	-	-	2.2	0.6	0.6	-

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	127	43	57	192	328	63	1810	64	101	903	15
Future Volume (vph)	20	127	43	57	192	328	63	1810	64	101	903	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		200	170		200	640		160
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			0.99							
Frt		0.966			0.915				0.850			0.850
Flt Protected		0.995			0.995		0.950			0.950		
Satd. Flow (prot)	0	3017	0	0	3133	0	1719	3438	1538	1703	3406	1524
Flt Permitted		0.733			0.891		0.950			0.950		
Satd. Flow (perm)	0	2223	0	0	2806	0	1719	3438	1538	1703	3406	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			137				73			73
Link Speed (mph)		25			25			40				40
Link Distance (ft)		532			677			514				440
Travel Time (s)		14.5			18.5			8.8				7.5
Confl. Peds. (#/hr)	2						2					
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%
Adj. Flow (vph)	22	137	46	61	206	353	68	1946	69	109	971	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	205	0	0	620	0	68	1946	69	109	971	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		13.8	56.5	56.5	11.0	53.7	53.7
Total Split (%)	25.0%	25.0%		25.0%	25.0%		15.3%	62.8%	62.8%	12.2%	59.7%	59.7%
Maximum Green (s)	18.0	18.0		18.0	18.0		9.3	52.0	52.0	6.5	49.2	49.2
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effect Green (s)		17.8			17.8		8.1	52.0	52.0	6.7	52.6	52.6
Actuated g/C Ratio		0.20			0.20		0.09	0.58	0.58	0.07	0.58	0.58
v/c Ratio		0.44			0.93		0.44	0.98	0.08	0.87	0.49	0.02
Control Delay		29.1			50.9		49.9	24.3	1.5	94.3	12.7	0.1
Queue Delay		0.0			0.0		0.0	3.2	0.0	0.0	0.0	0.0
Total Delay		29.1			50.9		49.9	27.5	1.5	94.3	12.7	0.1
LOS		C			D		D	C	A	F	B	A
Approach Delay		29.1			50.9			27.4			20.7	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.98
Intersection Signal Delay:	29.3
Intersection LOS:	C
Intersection Capacity Utilization:	93.7%
ICU Level of Service:	F
Analysis Period (min):	15





















Splits and Phases: 1: OR-224 & SE Harrison Street



HCM Signalized Intersection Capacity Analysis

1: OR-224 & SE Harrison Street

09/20/2019





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	127	43	57	192	328	63	1810	64	101	903	15
Future Volume (vph)	20	127	43	57	192	328	63	1810	64	101	903	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		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)		3017			3132		1719	3438	1538	1703	3406	1524
Flt Permitted		0.73			0.89		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2223			2804		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)	22	137	46	61	206	353	68	1946	69	109	971	16
RTOR Reduction (vph)	0	30	0	0	110	0	0	0	29	0	0	7
Lane Group Flow (vph)	0	175	0	0	510	0	68	1946	40	109	971	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)		17.8			17.8		7.0	52.0	52.0	6.7	51.7	51.7
Effective Green, g (s)		17.8			17.8		7.0	52.0	52.0	6.7	51.7	51.7
Actuated g/C Ratio		0.20			0.20		0.08	0.58	0.58	0.07	0.57	0.57
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)		439			554		133	1986	888	126	1956	875
v/s Ratio Prot							0.04	c0.57		c0.06	0.29	
v/s Ratio Perm		0.08			c0.18				0.03			0.01
v/c Ratio		0.40			0.92		0.51	0.98	0.04	0.87	0.50	0.01
Uniform Delay, d1		31.4			35.4		39.9	18.5	8.2	41.2	11.4	8.2
Progression Factor		1.00			1.00		1.13	0.52	0.65	1.00	1.00	1.00
Incremental Delay, d2		0.6			20.8		2.3	12.8	0.1	42.0	0.9	0.0
Delay (s)		32.0			56.2		47.3	22.5	5.4	83.2	12.3	8.2
Level of Service		C			E		D	C	A	F	B	A
Approach Delay (s)		32.0			56.2			22.8			19.3	
Approach LOS		C			E			C			B	
Intersection Summary												
HCM 2000 Control Delay			27.5				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			93.7%				ICU Level of Service				F	
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th Signalized Intersection Summary

1: OR-224 & SE Harrison Street

09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	127	43	57	192	328	63	1810	64	101	903	15
Future Volume (veh/h)	20	127	43	57	192	328	63	1810	64	101	903	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1841	1841	1841	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	22	137	46	61	206	353	68	1946	69	109	971	16
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	15	15	15	4	4	4	5	5	5	6	6	6
Cap, veh/h	51	273	105	95	225	283	87	2004	894	125	2064	921
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.05	0.58	0.58	0.07	0.60	0.60
Sat Flow, veh/h	0	1366	523	229	1127	1415	1739	3469	1547	1725	3441	1535
Grp Volume(v), veh/h	79	0	126	267	0	353	68	1946	69	109	971	16
Grp Sat Flow(s),veh/h/ln	459	0	1431	1356	0	1415	1739	1735	1547	1725	1721	1535
Q Serve(g_s), s	0.0	0.0	6.9	10.8	0.0	18.0	3.5	48.5	1.8	5.6	14.2	0.4
Cycle Q Clear(g_c), s	18.0	0.0	6.9	17.7	0.0	18.0	3.5	48.5	1.8	5.6	14.2	0.4
Prop In Lane	0.28		0.37	0.23		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	143	0	286	320	0	283	87	2004	894	125	2064	921
V/C Ratio(X)	0.55	0.00	0.44	0.83	0.00	1.25	0.78	0.97	0.08	0.87	0.47	0.02
Avail Cap(c_a), veh/h	143	0	286	320	0	283	180	2004	894	125	2064	921
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.87	0.00	0.87	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	0.0	31.6	36.5	0.0	36.0	42.3	18.3	8.4	41.3	10.0	7.3
Incr Delay (d2), s/veh	4.6	0.0	1.1	15.0	0.0	134.3	9.0	10.4	0.1	45.1	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	2.5	7.1	0.0	16.7	1.7	18.9	0.5	3.9	4.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	0.0	32.6	51.6	0.0	170.3	51.3	28.6	8.5	86.5	10.8	7.3
LnGrp LOS	D	A	C	D	A	F	D	C	A	F	B	A
Approach Vol, veh/h		205			620			2083			1096	
Approach Delay, s/veh		33.9			119.2			28.7			18.3	
Approach LOS		C			F			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	56.5		22.5	9.0	58.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.5	52.0		18.0	9.3	49.2		18.0				
Max Q Clear Time (g_c+I1), s	7.6	50.5		20.0	5.5	16.2		20.0				
Green Ext Time (p_c), s	0.0	1.3		0.0	0.0	7.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				40.1								
HCM 6th LOS				D								

Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Traffic Volume (vph)	32	10	59	5	18	24	41	1886	14	5	984	16
Future Volume (vph)	32	10	59	5	18	24	41	1886	14	5	984	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	240		260	150		250
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			0.99				0.98	1.00		
Frt		0.921			0.930				0.850			0.850
Flt Protected		0.985			0.995		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1710	0	1719	3438	1538	1687	3374	1509
Flt Permitted		0.914			0.956		0.950			0.950		
Satd. Flow (perm)	0	1567	0	0	1643	0	1719	3438	1504	1687	3374	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63			26				73			73
Link Speed (mph)		25			25			40				40
Link Distance (ft)		550			530			831				514
Travel Time (s)		15.0			14.5			14.2				8.8
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	34	11	63	5	19	26	44	2006	15	5	1047	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	108	0	0	50	0	44	2006	15	5	1047	17
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings

2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		11.2	58.0	58.0	9.5	56.3	56.3
Total Split (%)	25.0%	25.0%		25.0%	25.0%		12.4%	64.4%	64.4%	10.6%	62.6%	62.6%
Maximum Green (s)	18.0	18.0		18.0	18.0		6.7	53.5	53.5	5.0	51.8	51.8
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effect Green (s)		8.6			8.6		7.8	73.1	73.1	5.9	67.2	67.2
Actuated g/C Ratio		0.10			0.10		0.09	0.81	0.81	0.07	0.75	0.75
v/c Ratio		0.52			0.28		0.30	0.72	0.01	0.05	0.42	0.01
Control Delay		27.3			25.1		44.4	5.4	0.0	45.2	3.0	0.0
Queue Delay		0.0			0.0		0.0	0.1	0.0	0.0	0.0	0.0
Total Delay		27.3			25.1		44.4	5.4	0.0	45.2	3.0	0.0
LOS		C			C		D	A	A	D	A	A
Approach Delay		27.3			25.1			6.2			3.2	
Approach LOS		C			C			A			A	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	6.2
Intersection LOS:	A
Intersection Capacity Utilization	72.6%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 2: OR-224 & SE Monroe Street



HCM Signalized Intersection Capacity Analysis

2: OR-224 & SE Monroe Street

09/20/2019



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	1886	14	5	984	16
Future Volume (vph)	32	10	59	5	18	24	41	1886	14	5	984	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	2006	15	5	1047	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	2006	11	5	1047	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	0.31	
v/s Ratio Perm		c0.03			0.02				0.01			0.01
v/c Ratio		0.39			0.19		0.43	0.78	0.01	0.21	0.44	0.01
Uniform Delay, d1		39.1			38.4		40.8	6.6	2.8	43.8	5.6	3.9
Progression Factor		1.00			1.00		1.08	0.50	1.00	1.13	0.39	1.00
Incremental Delay, d2		1.9			0.7		1.9	1.6	0.0	3.7	0.5	0.0
Delay (s)		41.0			39.1		46.0	5.0	2.8	53.5	2.7	3.9
Level of Service		D			D		D	A	A	D	A	A
Approach Delay (s)		41.0			39.1			5.8			2.9	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	6.5	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	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary

2: OR-224 & SE Monroe Street

























09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↕	↗	↗	↕	↗
Traffic Volume (veh/h)	32	10	59	5	18	24	41	1886	14	5	984	16
Future Volume (veh/h)	32	10	59	5	18	24	41	1886	14	5	984	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1826	1826	1826	1796	1796	1796
Adj Flow Rate, veh/h	34	11	63	5	19	26	44	2006	15	5	1047	17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	2	2	2	5	5	5	7	7	7
Cap, veh/h	89	28	90	51	72	86	64	2588	1154	11	2442	1088
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.04	0.75	0.75	0.01	1.00	1.00
Sat Flow, veh/h	375	285	924	74	741	882	1739	3469	1546	1711	3413	1521
Grp Volume(v), veh/h	108	0	0	50	0	0	44	2006	15	5	1047	17
Grp Sat Flow(s),veh/h/ln	1584	0	0	1697	0	0	1739	1735	1546	1711	1706	1521
Q Serve(g_s), s	3.4	0.0	0.0	0.0	0.0	0.0	2.2	31.3	0.2	0.3	0.0	0.0
Cycle Q Clear(g_c), s	5.8	0.0	0.0	2.5	0.0	0.0	2.2	31.3	0.2	0.3	0.0	0.0
Prop In Lane	0.31		0.58	0.10		0.52	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	0	0	209	0	0	64	2588	1154	11	2442	1088
V/C Ratio(X)	0.52	0.00	0.00	0.24	0.00	0.00	0.68	0.78	0.01	0.45	0.43	0.02
Avail Cap(c_a), veh/h	364	0	0	377	0	0	129	2588	1154	95	2442	1088
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.55	0.55	0.55	0.87	0.87	0.87
Uniform Delay (d), s/veh	39.2	0.0	0.0	37.8	0.0	0.0	42.8	6.9	2.9	44.3	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.6	0.0	0.0	6.8	1.3	0.0	22.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	1.1	0.0	0.0	1.1	7.6	0.0	0.2	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	0.0	0.0	38.4	0.0	0.0	49.6	8.2	2.9	66.8	0.5	0.0
LnGrp LOS	D	A	A	D	A	A	D	A	A	E	A	A
Approach Vol, veh/h		108			50			2065				1069
Approach Delay, s/veh		41.3			38.4			9.0				0.8
Approach LOS		D			D			A				A
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	71.6		13.3	7.8	68.9		13.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	53.5		18.0	6.7	51.8		18.0				
Max Q Clear Time (g_c+I1), s	2.3	33.3		7.8	4.2	2.0		4.5				
Green Ext Time (p_c), s	0.0	15.1		0.4	0.0	9.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				7.9								
HCM 6th LOS				A								

Lanes, Volumes, Timings
3: SE Oak Street & OR-224

09/20/2019

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	60	170	96	80	276	193	88	936	31	149	1651	168
Future Volume (vph)	60	170	96	80	276	193	88	936	31	149	1651	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		80	180		180	400		250	540		150
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
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
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	3438	1538	1719	3438	1538	1719	3438	1538	1703	3406	1524
Flt Permitted	0.473			0.643			0.950			0.950		
Satd. Flow (perm)	852	3438	1511	1158	3438	1507	1719	3438	1538	1703	3406	1489
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			73			127			124
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		181			870			831			1978	
Travel Time (s)		4.9			23.7			14.2			33.7	
Confl. Peds. (#/hr)	5		4	4		5	1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%	6%
Adj. Flow (vph)	61	173	98	82	282	197	90	955	32	152	1685	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	173	98	82	282	197	90	955	32	152	1685	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: SE Oak Street & OR-224

09/20/2019

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
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
Detector Phase	4	4	4	8	8	5	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	12.1	12.1	47.2	47.2	20.3	55.4	55.4
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	13.4%	13.4%	52.4%	52.4%	22.6%	61.6%	61.6%
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0	7.6	7.6	42.7	42.7	15.8	50.9	50.9
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	0
Act Effect Green (s)	13.2	13.2	13.2	13.2	13.2	21.9	8.7	50.6	50.6	12.7	54.6	54.6
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.24	0.10	0.56	0.56	0.14	0.61	0.61
v/c Ratio	0.49	0.34	0.30	0.49	0.56	0.46	0.54	0.49	0.03	0.63	0.82	0.18
Control Delay	47.8	35.6	5.7	44.2	39.6	18.6	47.2	9.8	0.1	27.2	27.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	35.6	5.7	44.2	39.6	18.6	47.2	9.8	0.1	27.2	27.3	10.2
LOS	D	D	A	D	D	B	D	A	A	C	C	B
Approach Delay		29.0			32.9			12.6			25.9	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 23.5 Intersection LOS: C
 Intersection Capacity Utilization 78.4% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 3: SE Oak Street & OR-224



























Monroe Apartments 03/07/2019 2022 Background Conditions - AM Peak Hour
DS

Synchro 10 Report
Page 10

HCM Signalized Intersection Capacity Analysis

3: SE Oak Street & OR-224

























09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	60	170	96	80	276	193	88	936	31	149	1651	168
Future Volume (vph)	60	170	96	80	276	193	88	936	31	149	1651	168
Ideal Flow (vphp)	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)	853	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)	61	173	98	82	282	197	90	955	32	152	1685	171
RTOR Reduction (vph)	0	0	84	0	0	55	0	0	14	0	0	49
Lane Group Flow (vph)	61	173	14	82	282	142	90	955	18	152	1685	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	50.6	50.6	12.7	54.6	54.6
Effective Green, g (s)	13.2	13.2	13.2	13.2	13.2	21.9	8.7	50.6	50.6	12.7	54.6	54.6
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.24	0.10	0.56	0.56	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	1932	864	240	2066	903
v/s Ratio Prot		0.05			c0.08	0.03	0.05	0.28		c0.09	c0.49	
v/s Ratio Perm	0.07		0.01	0.07		0.06			0.01			0.08
v/c Ratio	0.49	0.34	0.07	0.49	0.56	0.32	0.54	0.49	0.02	0.63	0.82	0.14
Uniform Delay, d1	35.3	34.5	33.1	35.3	35.7	27.9	38.8	11.9	8.7	36.5	13.8	7.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.67	1.00	0.59	1.69	3.22
Incremental Delay, d2	3.0	0.4	0.1	2.2	1.4	0.4	3.3	0.8	0.0	2.7	1.8	0.2
Delay (s)	38.3	34.9	33.2	37.5	37.0	28.3	38.0	8.9	8.8	24.0	25.2	24.6
Level of Service	D	C	C	D	D	C	D	A	A	C	C	C
Approach Delay (s)		35.0			34.1			11.3			25.0	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			23.4								HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			90.0							13.5		
Intersection Capacity Utilization			78.4%								ICU Level of Service	D
Analysis Period (min)			15									
c	Critical Lane Group											

HCM 6th Signalized Intersection Summary

3: SE Oak Street & OR-224

09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	60	170	96	80	276	193	88	936	31	149	1651	168
Future Volume (veh/h)	60	170	96	80	276	193	88	936	31	149	1651	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	61	173	98	82	282	197	90	955	32	152	1685	171
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	6	6	6
Cap, veh/h	168	597	264	218	597	362	114	1978	881	186	2107	939
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.07	0.57	0.57	0.11	0.61	0.61
Sat Flow, veh/h	891	3469	1534	1076	3469	1514	1739	3469	1546	1725	3441	1534
Grp Volume(v), veh/h	61	173	98	82	282	197	90	955	32	152	1685	171
Grp Sat Flow(s),veh/h/ln	891	1735	1534	1076	1735	1514	1739	1735	1546	1725	1721	1534
Q Serve(g_s), s	6.0	3.9	5.1	6.5	6.6	10.3	4.6	14.7	0.8	7.8	33.5	4.4
Cycle Q Clear(g_c), s	12.6	3.9	5.1	10.4	6.6	10.3	4.6	14.7	0.8	7.8	33.5	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	168	597	264	218	597	362	114	1978	881	186	2107	939
V/C Ratio(X)	0.36	0.29	0.37	0.38	0.47	0.54	0.79	0.48	0.04	0.82	0.80	0.18
Avail Cap(c_a), veh/h	193	694	307	248	694	404	147	1978	881	303	2107	939
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.91	0.35	0.35	0.35
Uniform Delay (d), s/veh	39.2	32.5	33.0	37.0	33.6	30.1	41.4	11.5	8.5	39.3	13.2	7.6
Incr Delay (d2), s/veh	1.3	0.3	0.9	1.1	0.6	1.3	17.7	0.8	0.1	3.2	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.7	2.0	1.8	2.8	3.8	2.5	5.1	0.3	3.3	10.8	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	32.7	33.8	38.1	34.2	31.3	59.1	12.2	8.6	42.4	14.4	7.8
LnGrp LOS	D	C	C	D	C	C	E	B	A	D	B	A
Approach Vol, veh/h		332			561			1077			2008	
Approach Delay, s/veh		34.5			33.7			16.1			16.0	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.2	55.8		20.0	10.4	59.6		20.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.8	42.7		18.0	7.6	50.9		18.0				
Max Q Clear Time (g_c+I1), s	9.8	16.7		14.6	6.6	35.5		12.4				
Green Ext Time (p_c), s	0.2	7.2		0.6	0.0	10.8		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				20.1								
HCM 6th LOS				C								

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕		↕	↕↕	↕
Traffic Volume (vph)	17	52	24	66	31	22	7	1829	0	106	974	19
Future Volume (vph)	17	52	24	66	31	22	7	1829	0	106	974	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	550		0	550		80
Storage Lanes	0		0	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00				0.99						
Frt		0.966				0.850						0.850
Flt Protected		0.991			0.967		0.950			0.950		
Satd. Flow (prot)	0	1759	0	0	1733	1524	1719	3438	0	1687	3374	1509
Flt Permitted		0.926			0.699		0.950			0.950		
Satd. Flow (perm)	0	1644	0	0	1253	1503	1719	3438	0	1687	3374	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				73						73
Link Speed (mph)		25			25			50				50
Link Distance (ft)		167			225			581				1978
Travel Time (s)		4.6			6.1			7.9				27.0
Confl. Peds. (#/hr)	1						1					
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	18	55	25	69	33	23	7	1925	0	112	1025	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	102	23	7	1925	0	112	1025	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
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
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	56.0		11.5	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%	25.0%	10.6%	62.2%		12.8%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0	18.0	5.0	51.5		7.0	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	0
Act Effct Green (s)		11.7			11.9	11.9	5.8	56.6		10.2	70.1	70.1
Actuated g/C Ratio		0.13			0.13	0.13	0.06	0.63		0.11	0.78	0.78
v/c Ratio		0.43			0.61	0.09	0.06	0.89		0.59	0.39	0.02
Control Delay		34.2			52.0	0.7	40.7	23.2		44.4	10.3	1.5
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		34.2			52.0	0.7	40.7	23.2		44.4	10.3	1.5
LOS		C			D	A	D	C		D	B	A
Approach Delay		34.2			42.5			23.2			13.4	
Approach LOS		C			D			C			B	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	20.9
Intersection LOS:	C
Intersection Capacity Utilization:	79.7%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 4: OR-224 & SE Edison Street























Monroe Apartments 03/07/2019 2022 Background Conditions - AM Peak Hour
DS

Synchro 10 Report
Page 14

HCM Signalized Intersection Capacity Analysis

4: OR-224 & SE Edison Street





















09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	52	24	66	31	22	7	1829	0	106	974	19
Future Volume (vph)	17	52	24	66	31	22	7	1829	0	106	974	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	1.00	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.99	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)		1757			1734	1503	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)		1642			1253	1503	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	55	25	69	33	23	7	1925	0	112	1025	20
RTOR Reduction (vph)	0	15	0	0	0	20	0	0	0	0	0	6
Lane Group Flow (vph)	0	83	0	0	102	3	7	1925	0	112	1025	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)		10.6			10.6	10.6	1.2	55.7		10.2	64.7	64.7
Effective Green, g (s)		10.6			10.6	10.6	1.2	55.7		10.2	64.7	64.7
Actuated g/C Ratio		0.12			0.12	0.12	0.01	0.62		0.11	0.72	0.72
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)		193			147	177	22	2127		191	2425	1084
v/s Ratio Prot							0.00	c0.56		c0.07	0.30	
v/s Ratio Perm		0.05			c0.08	0.00						0.01
v/c Ratio		0.43			0.69	0.02	0.32	0.91		0.59	0.42	0.01
Uniform Delay, d1		36.9			38.1	35.1	44.0	14.9		37.9	5.1	3.6
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.80	1.92	1.00
Incremental Delay, d2		1.5			13.3	0.0	8.2	6.9		4.1	0.5	0.0
Delay (s)		38.4			51.4	35.1	52.2	21.8		34.5	10.3	3.6
Level of Service		D			D	D	D	C		C	B	A
Approach Delay (s)		38.4			48.4			21.9			12.5	
Approach LOS		D			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			20.1									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			90.0								13.5	
Intersection Capacity Utilization			79.7%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

4: OR-224 & SE Edison Street

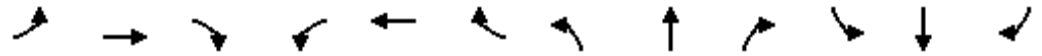
09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	52	24	66	31	22	7	1829	0	106	974	19
Future Volume (veh/h)	17	52	24	66	31	22	7	1829	0	106	974	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1811	1811	1811	1826	1826	0	1796	1796	1796
Adj Flow Rate, veh/h	18	55	25	69	33	23	7	1925	0	112	1025	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	6	6	6	5	5	0	7	7	7
Cap, veh/h	58	93	36	155	58	175	16	2282	0	133	2480	1106
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.01	0.66	0.00	0.08	0.73	0.73
Sat Flow, veh/h	94	814	311	771	509	1531	1739	3561	0	1711	3413	1522
Grp Volume(v), veh/h	98	0	0	102	0	23	7	1925	0	112	1025	20
Grp Sat Flow(s),veh/h/ln	1220	0	0	1280	0	1531	1739	1735	0	1711	1706	1522
Q Serve(g_s), s	0.8	0.0	0.0	0.0	0.0	1.2	0.4	38.4	0.0	5.8	10.6	0.3
Cycle Q Clear(g_c), s	7.9	0.0	0.0	7.1	0.0	1.2	0.4	38.4	0.0	5.8	10.6	0.3
Prop In Lane	0.18		0.26	0.68		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	187	0	0	214	0	175	16	2282	0	133	2480	1106
V/C Ratio(X)	0.52	0.00	0.00	0.48	0.00	0.13	0.45	0.84	0.00	0.84	0.41	0.02
Avail Cap(c_a), veh/h	328	0	0	334	0	306	97	2282	0	133	2480	1106
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.88	0.88	0.88
Uniform Delay (d), s/veh	37.8	0.0	0.0	38.3	0.0	35.8	44.4	11.8	0.0	41.0	4.8	3.4
Incr Delay (d2), s/veh	2.3	0.0	0.0	1.7	0.0	0.3	19.1	4.0	0.0	32.6	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	2.3	0.0	0.5	0.2	11.6	0.0	3.5	2.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	0.0	0.0	39.9	0.0	36.2	63.5	15.9	0.0	73.6	5.3	3.4
LnGrp LOS	D	A	A	D	A	D	E	B	A	E	A	A
Approach Vol, veh/h		98			125			1932			1157	
Approach Delay, s/veh		40.0			39.2			16.0			11.8	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.5	63.7		14.8	5.3	69.9		14.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.0	51.5		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	7.8	40.4		9.9	2.4	12.6		9.1				
Green Ext Time (p_c), s	0.0	8.6		0.2	0.0	8.0		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				16.2								
HCM 6th LOS				B								

Lanes, Volumes, Timings

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

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↑			↕	
Traffic Volume (vph)	47	111	0	0	33	44	0	91	42	119	0	81
Future Volume (vph)	47	111	0	0	33	44	0	91	42	119	0	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		30	0		0	100		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Fr _t						0.850		0.957				0.946
Fl _t Protected		0.985										0.971
Satd. Flow (prot)	0	1800	0	0	3167	1417	0	1783	0	0	1728	0
Fl _t Permitted		0.985										0.971
Satd. Flow (perm)	0	1800	0	0	3167	1417	0	1783	0	0	1728	0
Link Speed (mph)		25			25			35				35
Link Distance (ft)		225			302			180				1370
Travel Time (s)		6.1			8.2			3.5				26.7
Confl. Bikes (#/hr)			2									
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
Heavy Vehicles (%)	4%	4%	4%	14%	14%	14%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	56	132	0	0	39	52	0	108	50	142	0	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	188	0	0	39	52	0	158	0	0	238	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Stop			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.0%
Analysis Period (min)	15
	ICU Level of Service A

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

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↗			↕	
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	47	111	0	0	33	44	0	91	42	119	0	81
Future Volume (vph)	47	111	0	0	33	44	0	91	42	119	0	81
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)	56	132	0	0	39	52	0	108	50	142	0	96

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	188	20	20	52	158	238
Volume Left (vph)	56	0	0	0	0	142
Volume Right (vph)	0	0	0	52	50	96
Hadj (s)	0.13	0.24	0.24	-0.46	-0.16	-0.11
Departure Headway (s)	5.1	5.9	5.9	3.2	4.6	4.6
Degree Utilization, x	0.27	0.03	0.03	0.05	0.20	0.30
Capacity (veh/h)	652	551	552	1121	728	740
Control Delay (s)	10.0	7.9	7.9	5.2	8.8	9.6
Approach Delay (s)	10.0	6.3			8.8	9.6
Approach LOS	B	A			A	A

Intersection Summary	
Delay	9.1
Level of Service	A
Intersection Capacity Utilization	44.0% ICU Level of Service A
Analysis Period (min)	15

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	125	6	21	390	20	36	140	16	21	117	159
Future Volume (vph)	123	125	6	21	390	20	36	140	16	21	117	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	110		0	0		80	0		80
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00				0.97		1.00	0.98
Frt		0.994			0.993				0.850			0.850
Flt Protected	0.950			0.950				0.990			0.992	
Satd. Flow (prot)	1656	1733	0	1752	1829	0	0	1826	1568	0	1761	1509
Flt Permitted	0.950			0.950				0.904			0.928	
Satd. Flow (perm)	1650	1733	0	1752	1829	0	0	1668	1524	0	1646	1475
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			5				109			171
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		677			337			235			394	
Travel Time (s)		18.5			9.2			6.4			10.7	
Confl. Peds. (#/hr)	4					4			5	5		
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	9%	9%	9%	3%	3%	3%	3%	3%	3%	7%	7%	7%
Adj. Flow (vph)	132	134	6	23	419	22	39	151	17	23	126	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	132	140	0	23	441	0	0	190	17	0	149	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019

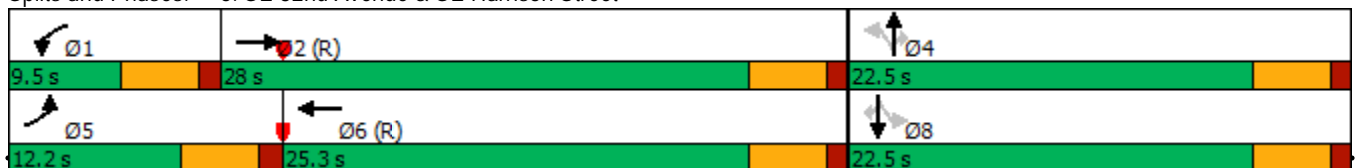


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4		8		8
Permitted Phases							4		4	8		8
Detector Phase	5	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	12.2	28.0		9.5	25.3		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	20.3%	46.7%		15.8%	42.2%		37.5%	37.5%	37.5%	37.5%	37.5%	37.5%
Maximum Green (s)	7.7	23.5		5.0	20.8		18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effect Green (s)	9.3	36.9		6.1	27.5			11.9	11.9		11.9	11.9
Actuated g/C Ratio	0.16	0.62		0.10	0.46			0.20	0.20		0.20	0.20
v/c Ratio	0.52	0.13		0.13	0.52			0.58	0.04		0.46	0.40
Control Delay	30.7	7.5		26.0	17.2			28.1	0.2		24.8	6.6
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	30.7	7.5		26.0	17.2			28.1	0.2		24.8	6.6
LOS	C	A		C	B			C	A		C	A
Approach Delay		18.7			17.7			25.8			15.1	
Approach LOS		B			B			C			B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 18.6
 Intersection LOS: B
 Intersection Capacity Utilization 61.1%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 6: SE 32nd Avenue & SE Harrison Street



Monroe Apartments 03/07/2019 2022 Background Conditions - AM Peak Hour
DS

Synchro 10 Report
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HCM Signalized Intersection Capacity Analysis
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↖	↗			↖	↗		↖	↗
Traffic Volume (vph)	123	125	6	21	390	20	36	140	16	21	117	159
Future Volume (vph)	123	125	6	21	390	20	36	140	16	21	117	159
Ideal Flow (vphp)	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	1732		1752	1828			1826	1524		1760	1474
Flt Permitted	0.95	1.00		0.95	1.00			0.90	1.00		0.93	1.00
Satd. Flow (perm)	1656	1732		1752	1828			1668	1524		1647	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)	132	134	6	23	419	22	39	151	17	23	126	171
RTOR Reduction (vph)	0	2	0	0	3	0	0	0	14	0	0	137
Lane Group Flow (vph)	132	138	0	23	438	0	0	190	3	0	149	34
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)	8.0	33.3		1.3	26.6			11.9	11.9		11.9	11.9
Effective Green, g (s)	8.0	33.3		1.3	26.6			11.9	11.9		11.9	11.9
Actuated g/C Ratio	0.13	0.55		0.02	0.44			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)	220	961		37	810			330	302		326	292
v/s Ratio Prot	c0.08	0.08		0.01	c0.24							
v/s Ratio Perm								c0.11	0.00		0.09	0.02
v/c Ratio	0.60	0.14		0.62	0.54			0.58	0.01		0.46	0.12
Uniform Delay, d1	24.5	6.5		29.1	12.2			21.8	19.3		21.2	19.7
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		28.2	2.6			2.4	0.0		1.0	0.2
Delay (s)	28.9	6.8		57.3	14.8			24.2	19.3		22.2	19.9
Level of Service	C	A		E	B			C	B		C	B
Approach Delay (s)		17.5			16.9			23.8			21.0	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	19.2	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	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
6: SE 32nd Avenue & SE Harrison Street











09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	125	6	21	390	20	36	140	16	21	117	159
Future Volume (veh/h)	123	125	6	21	390	20	36	140	16	21	117	159
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1856	1856	1856	1856	1856	1856	1796	1796	1796
Adj Flow Rate, veh/h	132	134	6	23	419	22	39	151	17	23	126	171
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	9	9	9	3	3	3	3	3	3	7	7	7
Cap, veh/h	166	752	34	47	658	35	72	209	468	69	255	443
Arrive On Green	0.10	0.45	0.45	0.03	0.38	0.38	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1682	1678	75	1767	1747	92	0	697	1559	0	852	1476
Grp Volume(v), veh/h	132	0	140	23	0	441	190	0	17	149	0	171
Grp Sat Flow(s),veh/h/ln	1682	0	1753	1767	0	1838	697	0	1559	852	0	1476
Q Serve(g_s), s	4.6	0.0	2.9	0.8	0.0	11.8	0.0	0.0	0.5	0.0	0.0	5.5
Cycle Q Clear(g_c), s	4.6	0.0	2.9	0.8	0.0	11.8	18.0	0.0	0.5	18.0	0.0	5.5
Prop In Lane	1.00		0.04	1.00		0.05	0.21		1.00	0.15		1.00
Lane Grp Cap(c), veh/h	166	0	786	47	0	692	282	0	468	325	0	443
V/C Ratio(X)	0.80	0.00	0.18	0.49	0.00	0.64	0.67	0.00	0.04	0.46	0.00	0.39
Avail Cap(c_a), veh/h	216	0	786	147	0	692	282	0	468	325	0	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.00	0.86	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	9.9	28.8	0.0	15.3	17.4	0.0	14.9	16.8	0.0	16.6
Incr Delay (d2), s/veh	12.6	0.0	0.4	7.7	0.0	4.4	6.2	0.0	0.0	1.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	1.1	0.4	0.0	5.3	2.4	0.0	0.2	1.6	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	0.0	10.3	36.5	0.0	19.8	23.7	0.0	14.9	17.8	0.0	17.2
LnGrp LOS	D	A	B	D	A	B	C	A	B	B	A	B
Approach Vol, veh/h		272			464			207			320	
Approach Delay, s/veh		24.3			20.6			23.0			17.5	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	31.4		22.5	10.4	27.1		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	7.7	20.8		18.0				
Max Q Clear Time (g_c+I1), s	2.8	4.9		20.0	6.6	13.8		20.0				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	1.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				21.0								
HCM 6th LOS				C								

Lanes, Volumes, Timings
7: SE Oak Street & SE Monroe Street

09/20/2019











						
Lane Group	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (vph)	123	112	58	116	342	72
Future Volume (vph)	123	112	58	116	342	72
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.910			
Flt Protected	0.950					0.960
Satd. Flow (prot)	1719	1538	1662	0	0	1771
Flt Permitted	0.950					0.960
Satd. Flow (perm)	1719	1538	1662	0	0	1771
Link Speed (mph)	25		25			25
Link Distance (ft)	870		163			887
Travel Time (s)	23.7		4.4			24.2
Confl. Peds. (#/hr)	1	2				
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	4%	4%	3%	3%
Adj. Flow (vph)	140	127	66	132	389	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	140	127	198	0	0	471
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Stop			Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
7: SE Oak Street & SE Monroe Street

09/20/2019

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	123	112	58	116	342	72
Future Volume (Veh/h)	123	112	58	116	342	72
Sign Control	Free		Stop			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	140	127	66	132	389	82
Pedestrians			1			2
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					
Median storage (veh)						
Upstream signal (ft)	870					
pX, platoon unblocked						
vC, conflicting volume	1		410	1	447	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1		410	1	447	283
tC, single (s)	4.1		6.5	6.2	7.1	6.5
tC, 2 stage (s)						
tF (s)	2.2		4.0	3.3	3.5	4.0
p0 queue free %	91		86	88	0	86
cM capacity (veh/h)	1601		481	1077	380	568
Direction, Lane #	NB 1	NB 2	SE 1	NW 1		
Volume Total	140	127	198	471		
Volume Left	140	0	0	389		
Volume Right	0	127	132	0		
cSH	1601	1700	762	403		
Volume to Capacity	0.09	0.07	0.26	1.17		
Queue Length 95th (ft)	7	0	26	455		
Control Delay (s)	7.5	0.0	11.4	130.0		
Lane LOS	A		B	F		
Approach Delay (s)	3.9		11.4	130.0		
Approach LOS			B	F		
Intersection Summary						
Average Delay			68.9			
Intersection Capacity Utilization			50.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
8: SE 37th Avenue & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Volume (vph)	4	98	75	59	226	1	151	37	45	1	60	30
Future Volume (vph)	4	98	75	59	226	1	151	37	45	1	60	30
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.943						0.918			0.955	
Flt Protected		0.999			0.990		0.950					
Satd. Flow (prot)	0	1705	0	0	1826	0	1736	1677	0	0	1728	0
Flt Permitted		0.999			0.990		0.950					
Satd. Flow (perm)	0	1705	0	0	1826	0	1736	1677	0	0	1728	0
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		887			352			519			331	
Travel Time (s)		24.2			9.6			10.1			9.0	
Confl. Peds. (#/hr)			3	3			3		1	1		3
Confl. Bikes (#/hr)									1			
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
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	4	110	84	66	254	1	170	42	51	1	67	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	198	0	0	321	0	170	93	0	0	102	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	


















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

8: SE 37th Avenue & SE Monroe Street

09/20/2019

												
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	59	226	1	151	37	45	1	60	30
Future Volume (vph)	4	98	75	59	226	1	151	37	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	66	254	1	170	42	51	1	67	34
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	198	321	170	93	102							
Volume Left (vph)	4	66	170	0	1							
Volume Right (vph)	84	1	0	51	34							
Hadj (s)	-0.17	0.09	0.57	-0.32	-0.11							
Departure Headway (s)	5.3	5.4	6.7	5.8	5.8							
Degree Utilization, x	0.29	0.48	0.31	0.15	0.17							
Capacity (veh/h)	622	636	498	579	546							
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 6th AWSC
8: SE 37th Avenue & SE Monroe Street

09/20/2019

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	4	98	75	59	226	1	151	37	45	1	60	30
Future Vol, veh/h	4	98	75	59	226	1	151	37	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
Heavy Vehicles, %	5	5	5	3	3	3	4	4	4	5	5	5
Mvmt Flow	4	110	84	66	254	1	170	42	51	1	67	34
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.6	13.3	11.4	10
HCM LOS	B	B	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	2%	21%	1%
Vol Thru, %	0%	45%	55%	79%	66%
Vol Right, %	0%	55%	42%	0%	33%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	151	82	177	286	91
LT Vol	151	0	4	59	1
Through Vol	0	37	98	226	60
RT Vol	0	45	75	1	30
Lane Flow Rate	170	92	199	321	102
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.313	0.147	0.294	0.48	0.165
Departure Headway (Hd)	6.65	5.753	5.325	5.373	5.808
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	541	623	674	672	617
Service Time	4.391	3.493	3.367	3.409	3.858
HCM Lane V/C Ratio	0.314	0.148	0.295	0.478	0.165
HCM Control Delay	12.4	9.5	10.6	13.3	10
HCM Lane LOS	B	A	B	B	A
HCM 95th-tile Q	1.3	0.5	1.2	2.6	0.6

Lanes, Volumes, Timings
 9: SE 37th Avenue & SE Washington Street

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	3	204	3	1	197
Future Volume (vph)	10	3	204	3	1	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.971		0.998			
Flt Protected	0.962					
Satd. Flow (prot)	1775	0	1841	0	0	1900
Flt Permitted	0.962					
Satd. Flow (perm)	1775	0	1841	0	0	1900
Link Speed (mph)	25		35			35
Link Distance (ft)	291		185			519
Travel Time (s)	7.9		3.6			10.1
Confl. Peds. (#/hr)	1			1	1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	3%	3%	0%	0%
Adj. Flow (vph)	11	3	232	3	1	224
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	235	0	0	225
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.2%
Analysis Period (min)	15
	ICU Level of Service A

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

09/20/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	3	204	3	1	197
Future Volume (Veh/h)	10	3	204	3	1	197
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	232	3	1	224
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	234			236	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	462	234			236	
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	809			1342	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	14	235	225			
Volume Left	11	0	1			
Volume Right	3	3	0			
cSH	600	1700	1342			
Volume to Capacity	0.02	0.14	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	11.1	0.0	0.0			
Lane LOS	B		A			
Approach Delay (s)	11.1	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			21.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM 6th TWSC
 9: SE 37th Avenue & SE Washington Street

09/20/2019

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	10	3	204	3	1	197
Future Vol, veh/h	10	3	204	3	1	197
Conflicting Peds, #/hr	1	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	3	3	0	0
Mvmt Flow	11	3	232	3	1	224

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	462	235	0	0	236
Stage 1	235	-	-	-	-
Stage 2	227	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	562	809	-	-	1343
Stage 1	809	-	-	-	-
Stage 2	815	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	560	808	-	-	1342
Mov Cap-2 Maneuver	560	-	-	-	-
Stage 1	808	-	-	-	-
Stage 2	813	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	603	1342
HCM Lane V/C Ratio	-	-	0.024	0.001
HCM Control Delay (s)	-	-	11.1	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Lanes, Volumes, Timings
 10: SE 37th Avenue & SE Railroad Avenue

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	162	144	82	33	61	148
Future Volume (vph)	162	144	82	33	61	148
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	30		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.961			
Flt Protected	0.950					0.986
Satd. Flow (prot)	1770	1583	1773	0	0	1819
Flt Permitted	0.950					0.986
Satd. Flow (perm)	1770	1583	1773	0	0	1819
Link Speed (mph)	35		35			35
Link Distance (ft)	419		1370			185
Travel Time (s)	8.2		26.7			3.6
Confl. Peds. (#/hr)		1				
Confl. Bikes (#/hr)		2				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Adj. Flow (vph)	178	158	90	36	67	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	178	158	126	0	0	230
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.6%
Analysis Period (min)	15
	ICU Level of Service A

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

09/20/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	162	144	82	33	61	148
Future Volume (Veh/h)	162	144	82	33	61	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)	178	158	90	36	67	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	405	109			126	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	405	109			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 %	69	83			95	
cM capacity (veh/h)	574	944			1454	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	336	126	230			
Volume Left	178	0	67			
Volume Right	158	36	0			
cSH	894	1700	1454			
Volume to Capacity	0.38	0.07	0.05			
Queue Length 95th (ft)	44	0	4			
Control Delay (s)	11.4	0.0	2.5			
Lane LOS	B		A			
Approach Delay (s)	11.4	0.0	2.5			
Approach LOS	B					
Intersection Summary						
Average Delay			6.4			
Intersection Capacity Utilization			33.6%	ICU Level of Service		A
Analysis Period (min)	15					

HCM 6th TWSC
 10: SE 37th Avenue & SE Railroad Avenue

09/20/2019

Intersection						
Int Delay, s/veh	6.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	162	144	82	33	61	148
Future Vol, veh/h	162	144	82	33	61	148
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	30	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	3	3	3	3
Mvmt Flow	178	158	90	36	67	163

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	405	109	0	0	126	0
Stage 1	108	-	-	-	-	-
Stage 2	297	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.13	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.227	-
Pot Cap-1 Maneuver	602	945	-	-	1454	-
Stage 1	916	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	571	944	-	-	1454	-
Mov Cap-2 Maneuver	571	-	-	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	716	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	2.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	571	944	1454
HCM Lane V/C Ratio	-	-	0.312	0.168	0.046
HCM Control Delay (s)	-	-	14.1	9.6	7.6
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0.6	0.1

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕		↗	↕↕	↗	↗	↗	↕↕	↗
Traffic Volume (vph)	13	276	62	70	195	175	70	1471	86	317	1756	39	
Future Volume (vph)	13	276	62	70	195	175	70	1471	86	317	1756	39	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		200	0		200	170		200	640		160	
Storage Lanes	0		1	0		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Ped Bike Factor		1.00			0.99		1.00		0.99	1.00		0.99	
Frt		0.973			0.940				0.850			0.850	
Flt Protected		0.998			0.992		0.950			0.950			
Satd. Flow (prot)	0	3326	0	0	3210	0	1752	3505	1568	1752	3505	1568	
Flt Permitted		0.912			0.711		0.950			0.950			
Satd. Flow (perm)	0	3039	0	0	2300	0	1752	3505	1545	1752	3505	1547	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		25			155				127			73	
Link Speed (mph)		25			25			40				40	
Link Distance (ft)		532			677			514				440	
Travel Time (s)		14.5			18.5			8.8				7.5	
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1	
Confl. Bikes (#/hr)			3						2				
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%	
Adj. Flow (vph)	13	285	64	72	201	180	72	1516	89	327	1810	40	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	362	0	0	453	0	72	1516	89	327	1810	40	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		0			0			12				12	
Link Offset(ft)		0			0			0				0	
Crosswalk Width(ft)		16			16			16				16	
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15		9	15		9	15		9	15		9	
Number of Detectors	1	2		1	2		1	2	1	1	2	1	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel													
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94				94	
Detector 2 Size(ft)		6			6			6				6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex	
Detector 2 Channel													

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019

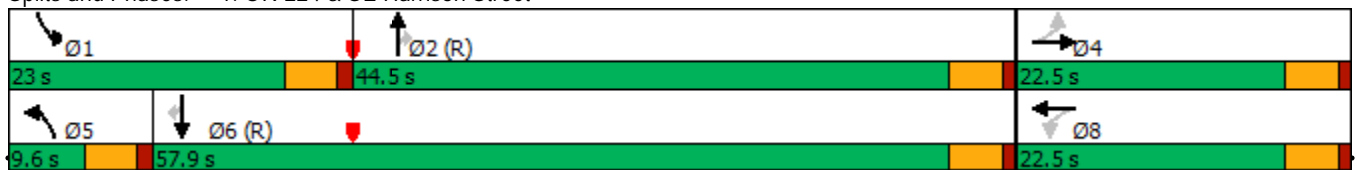


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		9.6	44.5	44.5	23.0	57.9	57.9
Total Split (%)	25.0%	25.0%		25.0%	25.0%		10.7%	49.4%	49.4%	25.6%	64.3%	64.3%
Maximum Green (s)	18.0	18.0		18.0	18.0		5.1	40.0	40.0	18.5	53.4	53.4
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)		15.9			15.9		6.0	41.8	41.8	18.8	56.8	56.8
Actuated g/C Ratio		0.18			0.18		0.07	0.46	0.46	0.21	0.63	0.63
v/c Ratio		0.65			0.85		0.62	0.93	0.11	0.89	0.82	0.04
Control Delay		37.5			39.1		54.9	31.5	4.0	63.1	18.1	0.7
Queue Delay		0.0			0.1		0.0	0.6	0.0	0.0	0.7	0.0
Total Delay		37.5			39.1		54.9	32.1	4.0	63.1	18.9	0.7
LOS		D			D		D	C	A	E	B	A
Approach Delay		37.5			39.1			31.6			25.2	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 29.8 Intersection LOS: C
 Intersection Capacity Utilization 97.5% ICU Level of Service F
 Analysis Period (min) 15





















Splits and Phases: 1: OR-224 & SE Harrison Street



HCM Signalized Intersection Capacity Analysis

1: OR-224 & SE Harrison Street

09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	276	62	70	195	175	70	1471	86	317	1756	39
Future Volume (vph)	13	276	62	70	195	175	70	1471	86	317	1756	39
Ideal Flow (vphp)	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)		3328			3210		1752	3505	1545	1752	3505	1547
Flt Permitted		0.91			0.71		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3040			2299		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)	13	285	64	72	201	180	72	1516	89	327	1810	40
RTOR Reduction (vph)	0	21	0	0	128	0	0	0	48	0	0	15
Lane Group Flow (vph)	0	341	0	0	325	0	72	1516	41	327	1810	25
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)		15.9			15.9		4.7	41.8	41.8	18.8	55.9	55.9
Effective Green, g (s)		15.9			15.9		4.7	41.8	41.8	18.8	55.9	55.9
Actuated g/C Ratio		0.18			0.18		0.05	0.46	0.46	0.21	0.62	0.62
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)		537			406		91	1627	717	365	2176	960
v/s Ratio Prot							0.04	c0.43		c0.19	0.52	
v/s Ratio Perm		0.11			c0.14				0.03			0.02
v/c Ratio		0.64			0.80		0.79	0.93	0.06	0.90	0.83	0.03
Uniform Delay, d1		34.4			35.5		42.2	22.8	13.3	34.6	13.4	6.6
Progression Factor		1.00			1.00		0.82	0.91	3.08	1.00	1.00	1.00
Incremental Delay, d2		2.5			10.9		29.5	9.1	0.1	23.3	3.9	0.0
Delay (s)		36.8			46.4		64.1	29.7	40.9	58.0	17.3	6.6
Level of Service		D			D		E	C	D	E	B	A
Approach Delay (s)		36.8			46.4			31.8			23.2	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			97.5%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

1: OR-224 & SE Harrison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↕↕	↗	↗	↕↕	↗
Traffic Volume (veh/h)	13	276	62	70	195	175	70	1471	86	317	1756	39
Future Volume (veh/h)	13	276	62	70	195	175	70	1471	86	317	1756	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	13	285	64	72	201	180	72	1516	89	327	1810	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	3	3	3	3	3	3
Cap, veh/h	49	486	113	98	212	232	92	1575	693	359	2108	940
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.05	0.45	0.45	0.20	0.60	0.60
Sat Flow, veh/h	32	2431	564	226	1058	1158	1767	3526	1551	1767	3526	1572
Grp Volume(v), veh/h	187	0	175	227	0	226	72	1516	89	327	1810	40
Grp Sat Flow(s),veh/h/ln	1483	0	1544	988	0	1454	1767	1763	1551	1767	1763	1572
Q Serve(g_s), s	0.4	0.0	9.2	8.8	0.0	13.2	3.6	37.6	3.0	16.3	38.2	0.9
Cycle Q Clear(g_c), s	13.6	0.0	9.2	18.0	0.0	13.2	3.6	37.6	3.0	16.3	38.2	0.9
Prop In Lane	0.07		0.37	0.32		0.80	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	339	0	309	250	0	291	92	1575	693	359	2108	940
V/C Ratio(X)	0.55	0.00	0.57	0.91	0.00	0.78	0.78	0.96	0.13	0.91	0.86	0.04
Avail Cap(c_a), veh/h	339	0	309	250	0	291	100	1575	693	363	2108	940
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.91	0.00	0.91	0.73	0.73	0.73	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	0.0	32.5	38.2	0.0	34.1	42.1	24.2	14.6	35.0	15.0	7.5
Incr Delay (d2), s/veh	1.9	0.0	2.4	31.3	0.0	11.5	23.1	12.4	0.3	26.0	4.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	3.6	7.2	0.0	5.6	2.1	16.7	1.0	9.2	13.9	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	0.0	34.9	69.5	0.0	45.6	65.2	36.6	14.9	61.1	19.8	7.6
LnGrp LOS	C	A	C	E	A	D	E	D	B	E	B	A
Approach Vol, veh/h		362			453			1677			2177	
Approach Delay, s/veh		34.5			57.5			36.6			25.8	
Approach LOS		C			E			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.8	44.7		22.5	9.2	58.3		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.5	40.0		18.0	5.1	53.4		18.0				
Max Q Clear Time (g_c+I1), s	18.3	39.6		15.6	5.6	40.2		20.0				
Green Ext Time (p_c), s	0.0	0.4		0.5	0.0	9.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Traffic Volume (vph)	29	31	85	16	20	21	33	1588	14	22	1850	24
Future Volume (vph)	29	31	85	16	20	21	33	1588	14	22	1850	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	240		260	150		250
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			0.99		1.00					0.97
Frt		0.921			0.950				0.850			0.850
Flt Protected		0.990			0.987		0.950			0.950		
Satd. Flow (prot)	0	1666	0	0	1773	0	1752	3505	1568	1752	3505	1568
Flt Permitted		0.936			0.819		0.950			0.950		
Satd. Flow (perm)	0	1574	0	0	1470	0	1751	3505	1568	1752	3505	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71			22				73			73
Link Speed (mph)		25			25			40				40
Link Distance (ft)		550			530			831				514
Travel Time (s)		15.0			14.5			14.2				8.8
Confl. Peds. (#/hr)	1		3	3		1	4					4
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	30	32	88	16	21	22	34	1637	14	23	1907	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	59	0	34	1637	14	23	1907	25
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		9.5	58.0	58.0	9.5	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		10.6%	64.4%	64.4%	10.6%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0		5.0	53.5	53.5	5.0	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effect Green (s)		10.3			10.3		6.8	66.0	66.0	6.5	63.5	63.5
Actuated g/C Ratio		0.11			0.11		0.08	0.73	0.73	0.07	0.71	0.71
v/c Ratio		0.62			0.32		0.26	0.64	0.01	0.18	0.77	0.02
Control Delay		31.2			28.6		42.0	5.1	0.0	55.5	6.7	0.0
Queue Delay		0.0			0.0		0.0	0.1	0.0	0.0	0.5	0.0
Total Delay		31.3			28.6		42.0	5.2	0.0	55.5	7.1	0.0
LOS		C			C		D	A	A	E	A	A
Approach Delay		31.3			28.6			5.9			7.6	
Approach LOS		C			C			A			A	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	8.1
Intersection LOS:	A
Intersection Capacity Utilization	69.4%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 2: OR-224 & SE Monroe Street



HCM Signalized Intersection Capacity Analysis

2: OR-224 & SE Monroe Street

09/20/2019



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	1588	14	22	1850	24
Future Volume (vph)	29	31	85	16	20	21	33	1588	14	22	1850	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	1637	14	23	1907	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	1637	10	23	1907	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	0.47		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	9.8	4.5
Progression Factor		1.00			1.00		1.00	0.54	1.00	1.37	0.40	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		43.2	4.8	4.0	61.2	5.5	4.5
Level of Service		D			D		D	A	A	E	A	A
Approach Delay (s)		39.4			37.0			5.6			6.1	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.6									A
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			90.0							13.5		
Intersection Capacity Utilization			69.4%									C
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th Signalized Intersection Summary
 2: OR-224 & SE Monroe Street

09/20/2019



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↕	↗	↗	↕	↗
Traffic Volume (veh/h)	29	31	85	16	20	21	33	1588	14	22	1850	24
Future Volume (veh/h)	29	31	85	16	20	21	33	1588	14	22	1850	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1900	1900	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	30	32	88	16	21	22	34	1637	14	23	1907	25
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	0	0	0	3	3	3	3	3	3
Cap, veh/h	75	55	115	86	101	81	56	2477	1102	43	2451	1090
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.03	0.70	0.70	0.05	1.00	1.00
Sat Flow, veh/h	217	443	937	283	818	655	1767	3526	1568	1767	3526	1568
Grp Volume(v), veh/h	150	0	0	59	0	0	34	1637	14	23	1907	25
Grp Sat Flow(s),veh/h/ln	1596	0	0	1756	0	0	1767	1763	1568	1767	1763	1568
Q Serve(g_s), s	4.7	0.0	0.0	0.0	0.0	0.0	1.7	23.2	0.2	1.1	0.0	0.0
Cycle Q Clear(g_c), s	8.1	0.0	0.0	2.7	0.0	0.0	1.7	23.2	0.2	1.1	0.0	0.0
Prop In Lane	0.20		0.59	0.27		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	0	0	267	0	0	56	2477	1102	43	2451	1090
V/C Ratio(X)	0.61	0.00	0.00	0.22	0.00	0.00	0.60	0.66	0.01	0.54	0.78	0.02
Avail Cap(c_a), veh/h	365	0	0	389	0	0	98	2477	1102	98	2451	1090
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.49	0.49	0.49	0.47	0.47	0.47
Uniform Delay (d), s/veh	38.1	0.0	0.0	35.8	0.0	0.0	43.0	7.4	4.0	42.3	0.0	0.0
Incr Delay (d2), s/veh	2.5	0.0	0.0	0.4	0.0	0.0	5.0	0.7	0.0	4.8	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.0	1.2	0.0	0.0	0.8	6.5	0.1	0.5	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	0.0	0.0	36.2	0.0	0.0	48.1	8.1	4.0	47.1	1.2	0.0
LnGrp LOS	D	A	A	D	A	A	D	A	A	D	A	A
Approach Vol, veh/h		150			59			1685			1955	
Approach Delay, s/veh		40.6			36.2			8.9			1.7	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	67.7		15.6	7.4	67.1		15.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	53.5		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	3.1	25.2		10.1	3.7	2.0		4.7				
Green Ext Time (p_c), s	0.0	15.0		0.5	0.0	25.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay	6.9
HCM 6th LOS	A

Lanes, Volumes, Timings
3: SE Oak Street & OR-224

09/20/2019

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	35	211	88	129	244	139	227	1682	64	113	1469	173
Future Volume (vph)	35	211	88	129	244	139	227	1682	64	113	1469	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		80	180		180	400		250	540		150
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
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
Ped Bike Factor	1.00		0.97	0.99		0.98	1.00		0.99	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	1752	3505	1568	1752	3505	1568	1770	3539	1583
Flt Permitted	0.525			0.578			0.950			0.950		
Satd. Flow (perm)	956	3471	1506	1055	3505	1542	1750	3505	1547	1769	3539	1531
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			18			73			127
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		181			870			831			1978	
Travel Time (s)		4.9			23.7			14.2			33.7	
Confl. Peds. (#/hr)	3		10	10		3	5		1	1		5
Confl. Bikes (#/hr)			3									1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	38	227	95	139	262	149	244	1809	69	122	1580	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	227	95	139	262	149	244	1809	69	122	1580	186
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
 3: SE Oak Street & OR-224

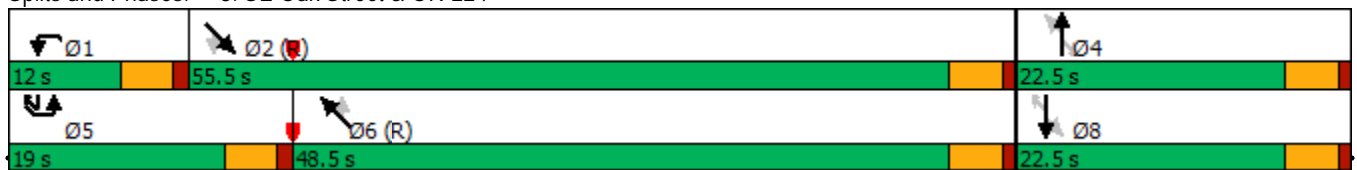
09/20/2019

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
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
Detector Phase	4	4	4	8	8	5	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	19.0	19.0	55.5	55.5	12.0	48.5	48.5
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	21.1%	21.1%	61.7%	61.7%	13.3%	53.9%	53.9%
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0	14.5	14.5	51.0	51.0	7.5	44.0	44.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	0
Act Effct Green (s)	15.3	15.3	15.3	15.3	15.3	30.1	14.8	52.7	52.7	8.5	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
v/c Ratio	0.23	0.38	0.26	0.78	0.44	0.28	0.85	0.88	0.07	0.73	0.87	0.22
Control Delay	34.7	34.4	4.7	63.4	35.2	17.3	58.7	17.0	4.5	51.9	32.3	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	34.4	4.7	63.4	35.2	17.3	58.7	17.0	4.5	51.9	32.3	13.0
LOS	C	C	A	E	D	B	E	B	A	D	C	B
Approach Delay		26.6			37.5			21.4			31.7	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 27.5
 Intersection LOS: C
 Intersection Capacity Utilization 83.8%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 3: SE Oak Street & OR-224



























Monroe Apartments 03/07/2019 2022 Background Conditions - PM Peak Hour
 DS

Synchro 10 Report
 Page 10

HCM Signalized Intersection Capacity Analysis

3: SE Oak Street & OR-224

























09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	35	211	88	129	244	139	227	1682	64	113	1469	173
Future Volume (vph)	35	211	88	129	244	139	227	1682	64	113	1469	173
Ideal Flow (vphp)	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	0.52	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)	955	3471	1505	1054	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)	38	227	95	139	262	149	244	1809	69	122	1580	186
RTOR Reduction (vph)	0	0	79	0	0	12	0	0	29	0	0	62
Lane Group Flow (vph)	38	227	16	139	262	137	244	1809	40	122	1580	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	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	52.7	52.7	8.5	46.4	46.4
Effective Green, g (s)	15.3	15.3	15.3	15.3	15.3	30.1	14.8	52.7	52.7	8.5	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	2052	905	167	1824	789
v/s Ratio Prot		0.07			0.07	0.04	c0.14	c0.52		0.07	0.45	
v/s Ratio Perm	0.04		0.01	c0.13		0.05			0.03			0.08
v/c Ratio	0.23	0.38	0.06	0.78	0.44	0.23	0.85	0.88	0.04	0.73	0.87	0.16
Uniform Delay, d1	32.3	33.2	31.3	35.7	33.5	21.6	36.5	16.0	7.9	39.6	19.1	11.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.05	0.72	1.97	0.72	1.37	2.62
Incremental Delay, d2	0.7	0.4	0.1	18.8	0.5	0.2	14.7	4.2	0.1	11.9	4.6	0.3
Delay (s)	33.0	33.6	31.4	54.5	34.0	21.8	53.0	15.7	15.7	40.5	30.7	30.4
Level of Service	C	C	C	D	C	C	D	B	B	D	C	C
Approach Delay (s)		33.0			35.9			20.0			31.3	
Approach LOS		C			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			27.0				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			83.8%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

3: SE Oak Street & OR-224

09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	35	211	88	129	244	139	227	1682	64	113	1469	173
Future Volume (veh/h)	35	211	88	129	244	139	227	1682	64	113	1469	173
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1856	1856	1856	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	38	227	95	139	262	149	244	1809	69	122	1580	186
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	3	3	3	3	3	3	2	2	2
Cap, veh/h	209	699	303	230	705	557	278	1998	887	148	1751	769
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.16	0.57	0.57	0.08	0.49	0.49
Sat Flow, veh/h	953	3497	1513	1041	3526	1549	1767	3526	1566	1781	3554	1561
Grp Volume(v), veh/h	38	227	95	139	262	149	244	1809	69	122	1580	186
Grp Sat Flow(s),veh/h/ln	953	1749	1513	1041	1763	1549	1767	1763	1566	1781	1777	1561
Q Serve(g_s), s	3.2	5.0	4.8	11.9	5.8	6.2	12.2	41.1	1.8	6.1	36.5	6.2
Cycle Q Clear(g_c), s	9.0	5.0	4.8	16.9	5.8	6.2	12.2	41.1	1.8	6.1	36.5	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	209	699	303	230	705	557	278	1998	887	148	1751	769
V/C Ratio(X)	0.18	0.32	0.31	0.60	0.37	0.27	0.88	0.91	0.08	0.82	0.90	0.24
Avail Cap(c_a), veh/h	209	699	303	230	705	557	285	1998	887	148	1751	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.55	0.55	0.55	0.65	0.65	0.65
Uniform Delay (d), s/veh	35.0	30.8	30.7	38.0	31.1	20.6	37.1	17.4	8.8	40.6	20.8	13.1
Incr Delay (d2), s/veh	0.4	0.3	0.6	4.4	0.3	0.3	15.6	4.3	0.1	20.8	5.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.1	1.8	3.3	2.5	2.2	6.2	15.1	0.6	3.4	14.6	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.4	31.1	31.3	42.4	31.4	20.8	52.6	21.7	8.9	61.4	26.3	13.6
LnGrp LOS	D	C	C	D	C	C	D	C	A	E	C	B
Approach Vol, veh/h		360			550			2122			1888	
Approach Delay, s/veh		31.6			31.3			24.8			27.3	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	55.5		22.5	18.6	48.9		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	51.0		18.0	14.5	44.0		18.0				
Max Q Clear Time (g_c+1), s	8.1	43.1		11.0	14.2	38.5		18.9				
Green Ext Time (p_c), s	0.0	6.4		1.1	0.0	4.4		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				27.0								
HCM 6th LOS				C								

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕		↕	↕↕	↕
Traffic Volume (vph)	18	84	14	109	64	85	31	1522	0	49	1834	19
Future Volume (vph)	18	84	14	109	64	85	31	1522	0	49	1834	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	550		0	550		80
Storage Lanes	0		0	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00	0.99				1.00		
Frt		0.984				0.850						0.850
Flt Protected		0.992			0.969		0.950			0.950		
Satd. Flow (prot)	0	1833	0	0	1823	1599	1770	3539	0	1736	3471	1553
Flt Permitted		0.935			0.685		0.950			0.950		
Satd. Flow (perm)	0	1728	0	0	1288	1578	1770	3539	0	1735	3471	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				90						73
Link Speed (mph)		25			25			50				50
Link Distance (ft)		167			225			581				1978
Travel Time (s)		4.6			6.1			7.9				27.0
Confl. Peds. (#/hr)			1	1						1	1	
Confl. Bikes (#/hr)						1				1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	19	89	15	116	68	90	33	1619	0	52	1951	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	123	0	0	184	90	33	1619	0	52	1951	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings

4: OR-224 & SE Edison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
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
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	58.0		9.5	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%	25.0%	10.6%	64.4%		10.6%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0	18.0	5.0	53.5		5.0	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	0
Act Effct Green (s)		16.0			16.0	16.0	5.3	57.0		5.5	59.3	59.3
Actuated g/C Ratio		0.18			0.18	0.18	0.06	0.63		0.06	0.66	0.66
v/c Ratio		0.39			0.80	0.25	0.32	0.72		0.49	0.85	0.02
Control Delay		34.0			61.2	8.9	49.2	14.7		45.8	14.7	0.3
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		34.0			61.2	8.9	49.2	14.7		45.8	14.7	0.3
LOS		C			E	A	D	B		D	B	A
Approach Delay		34.0			44.1			15.4			15.4	
Approach LOS		C			D			B			B	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 17.9
 Intersection LOS: B
 Intersection Capacity Utilization 74.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 4: OR-224 & SE Edison Street



HCM Signalized Intersection Capacity Analysis

4: OR-224 & SE Edison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕		↔	↕	↔
Traffic Volume (vph)	18	84	14	109	64	85	31	1522	0	49	1834	19
Future Volume (vph)	18	84	14	109	64	85	31	1522	0	49	1834	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	1.00	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.99	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)		1833			1822	1578	1770	3539		1736	3471	1553
Flt Permitted		0.93			0.68	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1726			1287	1578	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	89	15	116	68	90	33	1619	0	52	1951	20
RTOR Reduction (vph)	0	6	0	0	0	74	0	0	0	0	0	7
Lane Group Flow (vph)	0	117	0	0	184	16	33	1619	0	52	1951	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)		16.0			16.0	16.0	3.0	56.1		4.4	57.5	57.5
Effective Green, g (s)		16.0			16.0	16.0	3.0	56.1		4.4	57.5	57.5
Actuated g/C Ratio		0.18			0.18	0.18	0.03	0.62		0.05	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)		306			228	280	59	2205		84	2217	992
v/s Ratio Prot							0.02	0.46		c0.03	c0.56	
v/s Ratio Perm		0.07			c0.14	0.01						0.01
v/c Ratio		0.38			0.81	0.06	0.56	0.73		0.62	0.88	0.01
Uniform Delay, d1		32.6			35.5	30.7	42.8	11.8		42.0	13.4	5.9
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.87	0.82	1.00
Incremental Delay, d2		0.8			18.5	0.1	11.0	2.2		6.9	2.9	0.0
Delay (s)		33.4			54.0	30.8	53.9	14.0		43.5	13.9	5.9
Level of Service		C			D	C	D	B		D	B	A
Approach Delay (s)		33.4			46.4			14.8			14.6	
Approach LOS		C			D			B			B	

Intersection Summary		
HCM 2000 Control Delay	17.4	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	74.3%	13.5
Analysis Period (min)	15	ICU Level of Service
		D
c	Critical Lane Group	

HCM 6th Signalized Intersection Summary

4: OR-224 & SE Edison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕		↔	↕	↔
Traffic Volume (veh/h)	18	84	14	109	64	85	31	1522	0	49	1834	19
Future Volume (veh/h)	18	84	14	109	64	85	31	1522	0	49	1834	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1870	1870	0	1841	1841	1841
Adj Flow Rate, veh/h	19	89	15	116	68	90	33	1619	0	52	1951	20
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	0	4	4	4
Cap, veh/h	46	153	21	152	66	315	56	2166	0	71	2164	964
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.03	0.61	0.00	0.04	0.62	0.62
Sat Flow, veh/h	0	765	106	434	329	1574	1781	3647	0	1753	3497	1559
Grp Volume(v), veh/h	123	0	0	184	0	90	33	1619	0	52	1951	20
Grp Sat Flow(s),veh/h/ln	872	0	0	763	0	1574	1781	1777	0	1753	1749	1559
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	4.4	1.6	29.4	0.0	2.6	43.3	0.4
Cycle Q Clear(g_c), s	18.0	0.0	0.0	18.0	0.0	4.4	1.6	29.4	0.0	2.6	43.3	0.4
Prop In Lane	0.15		0.12	0.63		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	0	0	218	0	315	56	2166	0	71	2164	964
V/C Ratio(X)	0.56	0.00	0.00	0.84	0.00	0.29	0.59	0.75	0.00	0.73	0.90	0.02
Avail Cap(c_a), veh/h	220	0	0	218	0	315	99	2166	0	97	2164	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.42	0.42	0.42
Uniform Delay (d), s/veh	31.4	0.0	0.0	37.1	0.0	30.5	43.0	12.6	0.0	42.7	14.8	6.6
Incr Delay (d2), s/veh	3.1	0.0	0.0	25.0	0.0	0.5	9.7	2.4	0.0	7.5	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	5.6	0.0	1.7	0.8	9.6	0.0	1.2	13.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	0.0	0.0	62.1	0.0	31.0	52.7	15.0	0.0	50.2	17.8	6.6
LnGrp LOS	C	A	A	E	A	C	D	B	A	D	B	A
Approach Vol, veh/h		123			274			1652			2023	
Approach Delay, s/veh		34.5			51.9			15.8			18.5	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	59.4		22.5	7.3	60.2		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	53.5		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	4.6	31.4		20.0	3.6	45.3		20.0				
Green Ext Time (p_c), s	0.0	12.0		0.0	0.0	6.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Lanes, Volumes, Timings

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

09/20/2019




















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↖			↕	
Traffic Volume (vph)	139	1	0	0	152	219	0	134	14	42	0	93
Future Volume (vph)	139	1	0	0	152	219	0	134	14	42	0	93
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		30	0		0	100		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Fr _t						0.850		0.987				0.907
Fl _t Protected		0.953										0.985
Satd. Flow (prot)	0	1758	0	0	3505	1568	0	1839	0	0	1697	0
Fl _t Permitted		0.953										0.985
Satd. Flow (perm)	0	1758	0	0	3505	1568	0	1839	0	0	1697	0
Link Speed (mph)		25			25			35				35
Link Distance (ft)		225			302			180				1370
Travel Time (s)		6.1			8.2			3.5				26.7
Confl. Peds. (#/hr)	1						1					
Confl. Bikes (#/hr)							3					
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	153	1	0	0	167	241	0	147	15	46	0	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	154	0	0	167	241	0	162	0	0	148	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Stop			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.5%
ICU Level of Service	A
Analysis Period (min)	15

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

09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	139	1	0	0	152	219	0	134	14	42	0	93
Future Volume (vph)	139	1	0	0	152	219	0	134	14	42	0	93
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)	153	1	0	0	167	241	0	147	15	46	0	102
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total (vph)	154	84	84	241	162	148						
Volume Left (vph)	153	0	0	0	0	46						
Volume Right (vph)	0	0	0	241	15	102						
Hadj (s)	0.25	0.05	0.05	-0.65	-0.02	-0.35						
Departure Headway (s)	5.3	5.5	5.5	3.2	4.9	4.6						
Degree Utilization, x	0.23	0.13	0.13	0.21	0.22	0.19						
Capacity (veh/h)	637	612	614	1122	685	720						
Control Delay (s)	9.8	8.1	8.1	5.9	9.3	8.7						
Approach Delay (s)	9.8	6.8			9.3	8.7						
Approach LOS	A	A			A	A						
Intersection Summary												
Delay			8.1									
Level of Service			A									
Intersection Capacity Utilization			41.5%	ICU Level of Service		A						
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	448	3	31	258	23	33	133	32	56	151	157
Future Volume (vph)	173	448	3	31	258	23	33	133	32	56	151	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	110		0	0		80	0		80
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00				0.95		0.99	
Frt		0.999			0.988				0.850			0.850
Flt Protected	0.950			0.950				0.990			0.987	
Satd. Flow (prot)	1736	1825	0	1736	1799	0	0	1862	1599	0	1821	1568
Flt Permitted	0.950			0.950				0.896			0.860	
Satd. Flow (perm)	1715	1825	0	1736	1799	0	0	1686	1513	0	1575	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			8				191			191
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		677			337			235			394	
Travel Time (s)		18.5			9.2			6.4			10.7	
Confl. Peds. (#/hr)	11					11			20	20		
Confl. Bikes (#/hr)			1						1			
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	192	498	3	34	287	26	37	148	36	62	168	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	192	501	0	34	313	0	0	185	36	0	230	174
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019

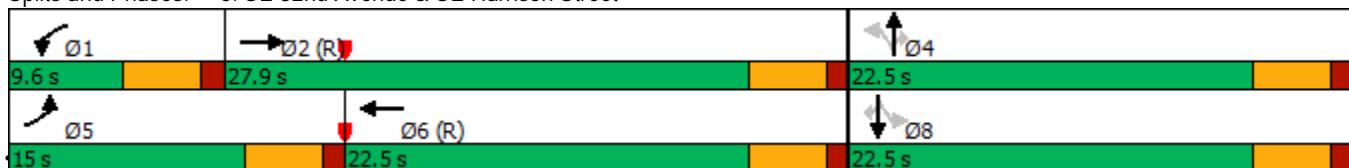


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4		8		8
Permitted Phases							4		4	8		8
Detector Phase	5	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	15.0	27.9		9.6	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	25.0%	46.5%		16.0%	37.5%		37.5%	37.5%	37.5%	37.5%	37.5%	37.5%
Maximum Green (s)	10.5	23.4		5.1	18.0		18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	10.4	33.2		5.9	22.4			13.7	13.7		13.7	13.7
Actuated g/C Ratio	0.17	0.55		0.10	0.37			0.23	0.23		0.23	0.23
v/c Ratio	0.64	0.50		0.20	0.46			0.48	0.07		0.64	0.35
Control Delay	34.2	13.3		28.2	18.3			23.5	0.3		28.8	4.6
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	34.2	13.3		28.2	18.3			23.5	0.3		28.8	4.6
LOS	C	B		C	B			C	A		C	A
Approach Delay		19.1			19.3			19.7			18.4	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 19.0 Intersection LOS: B
 Intersection Capacity Utilization 65.8% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 6: SE 32nd Avenue & SE Harrison Street



Monroe Apartments 03/07/2019 2022 Background Conditions - PM Peak Hour
DS

Synchro 10 Report
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HCM Signalized Intersection Capacity Analysis
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↖	↗			↖	↗		↖	↗
Traffic Volume (vph)	173	448	3	31	258	23	33	133	32	56	151	157
Future Volume (vph)	173	448	3	31	258	23	33	133	32	56	151	157
Ideal Flow (vphp)	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	1798			1863	1512		1808	1568
Flt Permitted	0.95	1.00		0.95	1.00			0.90	1.00		0.86	1.00
Satd. Flow (perm)	1736	1825		1736	1798			1685	1512		1576	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)	192	498	3	34	287	26	37	148	36	62	168	174
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	28	0	0	134
Lane Group Flow (vph)	192	501	0	34	308	0	0	185	8	0	230	40
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)	10.4	30.5		2.3	22.4			13.7	13.7		13.7	13.7
Effective Green, g (s)	10.4	30.5		2.3	22.4			13.7	13.7		13.7	13.7
Actuated g/C Ratio	0.17	0.51		0.04	0.37			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)	300	927		66	671			384	345		359	358
v/s Ratio Prot	c0.11	c0.27		0.02	0.17							
v/s Ratio Perm								0.11	0.01		c0.15	0.03
v/c Ratio	0.64	0.54		0.52	0.46			0.48	0.02		0.64	0.11
Uniform Delay, d1	23.1	10.0		28.3	14.2			20.1	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	4.6	2.3		6.6	2.3			1.0	0.0		3.9	0.1
Delay (s)	27.7	12.2		34.9	16.5			21.0	18.0		24.8	18.5
Level of Service	C	B		C	B			C	B		C	B
Approach Delay (s)		16.5			18.3			20.5			22.1	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.62	B
Actuated Cycle Length (s)	60.0	Sum of lost time (s)
Intersection Capacity Utilization	65.8%	13.5
Analysis Period (min)	15	ICU Level of Service
		C
c Critical Lane Group		

HCM 6th Signalized Intersection Summary
6: SE 32nd Avenue & SE Harrison Street

09/20/2019













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	448	3	31	258	23	33	133	32	56	151	157
Future Volume (veh/h)	173	448	3	31	258	23	33	133	32	56	151	157
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	0.99		0.95	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1885	1885	1885	1856	1856	1856
Adj Flow Rate, veh/h	192	498	3	34	287	26	37	148	36	62	168	174
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
Percent Heavy Veh, %	4	4	4	4	4	4	1	1	1	3	3	3
Cap, veh/h	238	802	5	63	563	51	72	218	453	76	158	456
Arrive On Green	0.14	0.44	0.44	0.04	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1753	1827	11	1753	1660	150	0	725	1512	0	526	1520
Grp Volume(v), veh/h	192	0	501	34	0	313	185	0	36	230	0	174
Grp Sat Flow(s),veh/h/ln	1753	0	1838	1753	0	1811	725	0	1512	526	0	1520
Q Serve(g_s), s	6.4	0.0	12.6	1.1	0.0	8.3	0.0	0.0	1.0	0.0	0.0	5.4
Cycle Q Clear(g_c), s	6.4	0.0	12.6	1.1	0.0	8.3	18.0	0.0	1.0	18.0	0.0	5.4
Prop In Lane	1.00		0.01	1.00		0.08	0.20		1.00	0.27		1.00
Lane Grp Cap(c), veh/h	238	0	807	63	0	614	290	0	453	234	0	456
V/C Ratio(X)	0.81	0.00	0.62	0.54	0.00	0.51	0.64	0.00	0.08	0.98	0.00	0.38
Avail Cap(c_a), veh/h	307	0	807	149	0	614	290	0	453	234	0	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.00	0.66	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.2	0.0	13.0	28.4	0.0	15.8	17.3	0.0	15.1	19.4	0.0	16.6
Incr Delay (d2), s/veh	7.9	0.0	2.4	6.9	0.0	3.0	4.6	0.0	0.1	54.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	5.1	0.6	0.0	3.7	2.2	0.0	0.3	5.9	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	0.0	15.4	35.4	0.0	18.8	22.0	0.0	15.1	73.4	0.0	17.1
LnGrp LOS	C	A	B	D	A	B	C	A	B	E	A	B
Approach Vol, veh/h		693			347			221				404
Approach Delay, s/veh		20.3			20.5			20.8				49.2
Approach LOS		C			C			C				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	30.8		22.5	12.6	24.9		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	23.4		18.0	10.5	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.1	14.6		20.0	8.4	10.3		20.0				
Green Ext Time (p_c), s	0.0	2.2		0.0	0.1	1.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Lanes, Volumes, Timings
7: SE Oak Street & SE Monroe Street

09/20/2019

						
Lane Group	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (vph)	147	346	126	152	225	46
Future Volume (vph)	147	346	126	152	225	46
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.926			
Flt Protected	0.950					0.960
Satd. Flow (prot)	1787	1599	1725	0	0	1788
Flt Permitted	0.950					0.960
Satd. Flow (perm)	1787	1599	1725	0	0	1788
Link Speed (mph)	25		25			25
Link Distance (ft)	870		163			887
Travel Time (s)	23.7		4.4			24.2
Confl. Peds. (#/hr)	4	7		2	2	
Confl. Bikes (#/hr)		5		4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%
Adj. Flow (vph)	160	376	137	165	245	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	160	376	302	0	0	295
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Stop			Stop











Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.2%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

7: SE Oak Street & SE Monroe Street

09/20/2019

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	147	346	126	152	225	46
Future Volume (Veh/h)	147	346	126	152	225	46
Sign Control	Free		Stop		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	160	376	137	165	245	50
Pedestrians	2		4		7	
Lane Width (ft)	12.0		12.0		12.0	
Walking Speed (ft/s)	3.5		3.5		3.5	
Percent Blockage	0		0		1	
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)	870					
pX, platoon unblocked						
vC, conflicting volume	4		707	6	562	331
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4		707	6	562	331
tC, single (s)	4.1		6.5	6.2	7.1	6.5
tC, 2 stage (s)						
tF (s)	2.2		4.0	3.3	3.5	4.0
p0 queue free %	90		57	85	0	90
cM capacity (veh/h)	1618		321	1071	226	525
Direction, Lane #	NB 1	NB 2	SE 1	NW 1		
Volume Total	160	376	302	295		
Volume Left	160	0	0	245		
Volume Right	0	376	165	0		
cSH	1618	1700	520	250		
Volume to Capacity	0.10	0.22	0.58	1.18		
Queue Length 95th (ft)	8	0	92	343		
Control Delay (s)	7.5	0.0	21.1	156.4		
Lane LOS	A		C	F		
Approach Delay (s)	2.2		21.1	156.4		
Approach LOS			C	F		
Intersection Summary						
Average Delay			47.4			
Intersection Capacity Utilization			50.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
8: SE 37th Avenue & SE Monroe Street

09/20/2019




















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘			↕	
Traffic Volume (vph)	15	288	154	62	149	6	91	87	203	5	65	8
Future Volume (vph)	15	288	154	62	149	6	91	87	203	5	65	8
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.955			0.996			0.895			0.986	
Flt Protected		0.998			0.986		0.950				0.997	
Satd. Flow (prot)	0	1775	0	0	1829	0	1787	1684	0	0	1813	0
Flt Permitted		0.998			0.986		0.950				0.997	
Satd. Flow (perm)	0	1775	0	0	1829	0	1787	1684	0	0	1813	0
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		887			352			523			331	
Travel Time (s)		24.2			9.6			10.2			9.0	
Confl. Peds. (#/hr)	6		2	2		6			4	4		
Confl. Bikes (#/hr)			2			1			3			
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	17	320	171	69	166	7	101	97	226	6	72	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	508	0	0	242	0	101	323	0	0	87	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	63.3%
ICU Level of Service	B
Analysis Period (min)	15

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

09/20/2019

												
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	154	62	149	6	91	87	203	5	65	8
Future Volume (vph)	15	288	154	62	149	6	91	87	203	5	65	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	171	69	166	7	101	97	226	6	72	9
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	508	242	101	323	87							
Volume Left (vph)	17	69	101	0	6							
Volume Right (vph)	171	7	0	226	9							
Hadj (s)	-0.16	0.07	0.52	-0.47	0.00							
Departure Headway (s)	5.8	6.6	7.5	6.5	7.4							
Degree Utilization, x	0.82	0.44	0.21	0.58	0.18							
Capacity (veh/h)	601	498	455	518	434							
Control Delay (s)	30.4	14.7	11.3	17.0	12.0							
Approach Delay (s)	30.4	14.7	15.6		12.0							
Approach LOS	D	B	C		B							
Intersection Summary												
Delay			21.1									
Level of Service			C									
Intersection Capacity Utilization			63.3%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM 6th AWSC
8: SE 37th Avenue & SE Monroe Street

09/20/2019

Intersection	
Intersection Delay, s/veh	21.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	15	288	154	62	149	6	91	87	203	5	65	8
Future Vol, veh/h	15	288	154	62	149	6	91	87	203	5	65	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
Heavy Vehicles, %	2	2	2	2	2	2	1	1	1	3	3	3
Mvmt Flow	17	320	171	69	166	7	101	97	226	6	72	9
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	30.5	14.8	16.5	12
HCM LOS	D	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	3%	29%	6%
Vol Thru, %	0%	30%	63%	69%	83%
Vol Right, %	0%	70%	34%	3%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	290	457	217	78
LT Vol	91	0	15	62	5
Through Vol	0	87	288	149	65
RT Vol	0	203	154	6	8
Lane Flow Rate	101	322	508	241	87
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.21	0.58	0.824	0.441	0.177
Departure Headway (Hd)	7.493	6.48	5.842	6.581	7.34
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	479	557	619	547	487
Service Time	5.241	4.227	3.881	4.632	5.41
HCM Lane V/C Ratio	0.211	0.578	0.821	0.441	0.179
HCM Control Delay	12.2	17.8	30.5	14.8	12
HCM Lane LOS	B	C	D	B	B
HCM 95th-tile Q	0.8	3.7	8.6	2.2	0.6

Lanes, Volumes, Timings
 9: SE 37th Avenue & SE Washington Street

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	1	356	8	2	250
Future Volume (vph)	3	1	356	8	2	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.966		0.997			
Flt Protected	0.964					
Satd. Flow (prot)	1769	0	1876	0	0	1863
Flt Permitted	0.964					
Satd. Flow (perm)	1769	0	1876	0	0	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	295		182			523
Travel Time (s)	8.0		3.5			10.2
Confl. Peds. (#/hr)	6	1		1	1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	1%	1%	2%	2%
Adj. Flow (vph)	3	1	391	9	2	275
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	400	0	0	277
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: SE 37th Avenue & SE Washington Street

09/20/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	1	356	8	2	250
Future Volume (Veh/h)	3	1	356	8	2	250
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	391	9	2	275
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	682	398			401	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	682	398			401	
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)	415	655			1157	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	400	277			
Volume Left	3	0	2			
Volume Right	1	9	0			
cSH	457	1700	1157			
Volume to Capacity	0.01	0.24	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	12.9	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	12.9	0.0	0.1			
Approach LOS	B					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			29.6%	ICU Level of Service		A
Analysis Period (min)	15					

HCM 6th TWSC
 9: SE 37th Avenue & SE Washington Street

09/20/2019

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	1	356	8	2	250
Future Vol, veh/h	3	1	356	8	2	250
Conflicting Peds, #/hr	6	1	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	3	1	391	9	2	275

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	682	398	0	0	401
Stage 1	397	-	-	-	-
Stage 2	285	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218
Pot Cap-1 Maneuver	419	656	-	-	1158
Stage 1	683	-	-	-	-
Stage 2	768	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	415	655	-	-	1157
Mov Cap-2 Maneuver	415	-	-	-	-
Stage 1	682	-	-	-	-
Stage 2	762	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	457	1157
HCM Lane V/C Ratio	-	-	0.01	0.002
HCM Control Delay (s)	-	-	13	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Lanes, Volumes, Timings
 10: SE 37th Avenue & SE Railroad Avenue

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	110	99	296	192	164	121
Future Volume (vph)	110	99	296	192	164	121
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	30		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.947			
Flt Protected	0.950					0.972
Satd. Flow (prot)	1787	1599	1781	0	0	1811
Flt Permitted	0.950					0.972
Satd. Flow (perm)	1787	1599	1781	0	0	1811
Link Speed (mph)	35		35			35
Link Distance (ft)	419		1370			182
Travel Time (s)	8.2		26.7			3.5
Confl. Peds. (#/hr)		2				
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%
Adj. Flow (vph)	125	113	336	218	186	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	125	113	554	0	0	324
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	59.3%
ICU Level of Service	B
Analysis Period (min)	15

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

09/20/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	110	99	296	192	164	121
Future Volume (Veh/h)	110	99	296	192	164	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)	125	113	336	218	186	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	955	447			554	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	955	447			554	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	82			82	
cM capacity (veh/h)	235	612			1016	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	238	554	324			
Volume Left	125	0	186			
Volume Right	113	218	0			
cSH	390	1700	1016			
Volume to Capacity	0.61	0.33	0.18			
Queue Length 95th (ft)	97	0	17			
Control Delay (s)	27.6	0.0	6.2			
Lane LOS	D		A			
Approach Delay (s)	27.6	0.0	6.2			
Approach LOS	D					
Intersection Summary						
Average Delay			7.7			
Intersection Capacity Utilization			59.3%	ICU Level of Service		B
Analysis Period (min)	15					

HCM 6th TWSC
10: SE 37th Avenue & SE Railroad Avenue

09/20/2019

Intersection						
Int Delay, s/veh	7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	110	99	296	192	164	121
Future Vol, veh/h	110	99	296	192	164	121
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	30	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	125	113	336	218	186	138

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	955	447	0	0	554	0
Stage 1	445	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.12	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.218	-
Pot Cap-1 Maneuver	288	614	-	-	1016	-
Stage 1	648	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	231	613	-	-	1016	-
Mov Cap-2 Maneuver	231	-	-	-	-	-
Stage 1	648	-	-	-	-	-
Stage 2	485	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.6	0	5.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	231	613	1016	-
HCM Lane V/C Ratio	-	-	0.541	0.184	0.183	-
HCM Control Delay (s)	-	-	37.6	12.2	9.3	0
HCM Lane LOS	-	-	E	B	A	A
HCM 95th %tile Q(veh)	-	-	2.9	0.7	0.7	-

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕		↗	↕↕	↗	↗	↗	↕↕	↗
Traffic Volume (vph)	20	128	43	57	195	339	63	1822	64	105	907	15	
Future Volume (vph)	20	128	43	57	195	339	63	1822	64	105	907	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		200	0		200	170		200	640		160	
Storage Lanes	0		1	0		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Ped Bike Factor		1.00			0.99								
Frt		0.967			0.914				0.850			0.850	
Flt Protected		0.995			0.995		0.950			0.950			
Satd. Flow (prot)	0	3020	0	0	3130	0	1719	3438	1538	1703	3406	1524	
Flt Permitted		0.727			0.892		0.950			0.950			
Satd. Flow (perm)	0	2207	0	0	2806	0	1719	3438	1538	1703	3406	1524	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		37			138				73			73	
Link Speed (mph)		25			25			40				40	
Link Distance (ft)		532			677			514				440	
Travel Time (s)		14.5			18.5			8.8				7.5	
Confl. Peds. (#/hr)	2						2						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%	
Adj. Flow (vph)	22	138	46	61	210	365	68	1959	69	113	975	16	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	206	0	0	636	0	68	1959	69	113	975	16	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		0			0			12				12	
Link Offset(ft)		0			0			0				0	
Crosswalk Width(ft)		16			16			16				16	
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15		9	15		9	15		9	15		9	
Number of Detectors	1	2		1	2		1	2	1	1	2	1	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel													
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94		
Detector 2 Size(ft)		6			6			6			6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel													
Detector 2 Extend (s)		0.0			0.0			0.0			0.0		

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		13.8	56.4	56.4	11.1	53.7	53.7
Total Split (%)	25.0%	25.0%		25.0%	25.0%		15.3%	62.7%	62.7%	12.3%	59.7%	59.7%
Maximum Green (s)	18.0	18.0		18.0	18.0		9.3	51.9	51.9	6.6	49.2	49.2
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effect Green (s)		18.0			18.0		8.1	51.9	51.9	6.6	52.4	52.4
Actuated g/C Ratio		0.20			0.20		0.09	0.58	0.58	0.07	0.58	0.58
v/c Ratio		0.44			0.95		0.44	0.99	0.08	0.91	0.49	0.02
Control Delay		29.1			53.2		49.9	26.1	1.5	104.3	12.8	0.1
Queue Delay		0.0			0.0		0.0	3.7	0.0	0.0	0.0	0.0
Total Delay		29.1			53.2		49.9	29.8	1.5	104.3	12.8	0.1
LOS		C			D		D	C	A	F	B	A
Approach Delay		29.1			53.2			29.5			22.0	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.99
Intersection Signal Delay:	31.2
Intersection LOS:	C
Intersection Capacity Utilization:	94.8%
ICU Level of Service:	F
Analysis Period (min):	15





















Splits and Phases: 1: OR-224 & SE Harrison Street



HCM Signalized Intersection Capacity Analysis

1: OR-224 & SE Harrison Street

09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	128	43	57	195	339	63	1822	64	105	907	15
Future Volume (vph)	20	128	43	57	195	339	63	1822	64	105	907	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		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			3130		1719	3438	1538	1703	3406	1524
Flt Permitted		0.73			0.89		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2205			2806		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)	22	138	46	61	210	365	68	1959	69	113	975	16
RTOR Reduction (vph)	0	30	0	0	110	0	0	0	29	0	0	7
Lane Group Flow (vph)	0	176	0	0	526	0	68	1959	40	113	975	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)		18.0			18.0		7.0	51.9	51.9	6.6	51.5	51.5
Effective Green, g (s)		18.0			18.0		7.0	51.9	51.9	6.6	51.5	51.5
Actuated g/C Ratio		0.20			0.20		0.08	0.58	0.58	0.07	0.57	0.57
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			561		133	1982	886	124	1948	872
v/s Ratio Prot							0.04	c0.57		c0.07	0.29	
v/s Ratio Perm		0.08			c0.19				0.03			0.01
v/c Ratio		0.40			0.94		0.51	0.99	0.04	0.91	0.50	0.01
Uniform Delay, d1		31.3			35.4		39.9	18.8	8.3	41.4	11.5	8.3
Progression Factor		1.00			1.00		1.13	0.52	0.65	1.00	1.00	1.00
Incremental Delay, d2		0.6			23.3		2.3	14.4	0.1	54.2	0.9	0.0
Delay (s)		31.9			58.7		47.3	24.2	5.5	95.6	12.5	8.3
Level of Service		C			E		D	C	A	F	B	A
Approach Delay (s)		31.9			58.7			24.3			20.9	
Approach LOS		C			E			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.2				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			94.8%				ICU Level of Service				F	
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th Signalized Intersection Summary

1: OR-224 & SE Harrison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔		↗	↕↕	↗	↗	↕↕	↗
Traffic Volume (veh/h)	20	128	43	57	195	339	63	1822	64	105	907	15
Future Volume (veh/h)	20	128	43	57	195	339	63	1822	64	105	907	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1841	1841	1841	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	22	138	46	61	210	365	68	1959	69	113	975	16
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	15	15	15	4	4	4	5	5	5	6	6	6
Cap, veh/h	51	274	104	94	226	283	87	2001	892	126	2064	921
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.05	0.58	0.58	0.07	0.60	0.60
Sat Flow, veh/h	0	1372	521	225	1130	1415	1739	3469	1547	1725	3441	1535
Grp Volume(v), veh/h	80	0	126	271	0	365	68	1959	69	113	975	16
Grp Sat Flow(s),veh/h/ln	463	0	1431	1355	0	1415	1739	1735	1547	1725	1721	1535
Q Serve(g_s), s	0.0	0.0	7.0	11.0	0.0	18.0	3.5	49.4	1.8	5.8	14.2	0.4
Cycle Q Clear(g_c), s	18.0	0.0	7.0	18.0	0.0	18.0	3.5	49.4	1.8	5.8	14.2	0.4
Prop In Lane	0.28		0.36	0.23		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	144	0	286	320	0	283	87	2001	892	126	2064	921
V/C Ratio(X)	0.56	0.00	0.44	0.85	0.00	1.29	0.78	0.98	0.08	0.89	0.47	0.02
Avail Cap(c_a), veh/h	144	0	286	320	0	283	180	2001	892	126	2064	921
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.86	0.00	0.86	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	0.0	31.6	36.7	0.0	36.0	42.3	18.5	8.4	41.4	10.1	7.3
Incr Delay (d2), s/veh	4.6	0.0	1.1	16.4	0.0	151.3	9.0	11.7	0.1	49.1	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	2.5	7.4	0.0	18.0	1.7	19.5	0.5	4.1	4.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	0.0	32.7	53.1	0.0	187.3	51.3	30.2	8.5	90.4	10.8	7.3
LnGrp LOS	D	A	C	D	A	F	D	C	A	F	B	A
Approach Vol, veh/h		206			636			2096			1104	
Approach Delay, s/veh		33.9			130.1			30.2			18.9	
Approach LOS		C			F			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	56.4		22.5	9.0	58.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.6	51.9		18.0	9.3	49.2		18.0				
Max Q Clear Time (g_c+I1), s	7.8	51.4		20.0	5.5	16.2		20.0				
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	7.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay	43.0
HCM 6th LOS	D

Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕↕	↗	↗	↕↕	↗
Traffic Volume (vph)	32	10	59	5	18	24	41	1898	14	5	988	16
Future Volume (vph)	32	10	59	5	18	24	41	1898	14	5	988	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	240		260	150		250
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			0.99				0.98	1.00		
Frt		0.921			0.930				0.850			0.850
Flt Protected		0.985			0.995		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1710	0	1719	3438	1538	1687	3374	1509
Flt Permitted		0.914			0.956		0.950			0.950		
Satd. Flow (perm)	0	1567	0	0	1643	0	1719	3438	1504	1687	3374	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63			26				73			73
Link Speed (mph)		25			25			40				40
Link Distance (ft)		550			530			831				514
Travel Time (s)		15.0			14.5			14.2				8.8
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	34	11	63	5	19	26	44	2019	15	5	1051	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	108	0	0	50	0	44	2019	15	5	1051	17
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings

2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		11.2	58.0	58.0	9.5	56.3	56.3
Total Split (%)	25.0%	25.0%		25.0%	25.0%		12.4%	64.4%	64.4%	10.6%	62.6%	62.6%
Maximum Green (s)	18.0	18.0		18.0	18.0		6.7	53.5	53.5	5.0	51.8	51.8
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effect Green (s)		8.6			8.6		7.8	73.1	73.1	5.9	67.2	67.2
Actuated g/C Ratio		0.10			0.10		0.09	0.81	0.81	0.07	0.75	0.75
v/c Ratio		0.52			0.28		0.30	0.72	0.01	0.05	0.42	0.01
Control Delay		27.3			25.1		44.2	5.5	0.0	45.4	3.0	0.0
Queue Delay		0.0			0.0		0.0	0.1	0.0	0.0	0.0	0.0
Total Delay		27.3			25.1		44.2	5.6	0.0	45.4	3.0	0.0
LOS		C			C		D	A	A	D	A	A
Approach Delay		27.3			25.1			6.4			3.2	
Approach LOS		C			C			A			A	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 6.3 Intersection LOS: A
 Intersection Capacity Utilization 73.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: OR-224 & SE Monroe Street



HCM Signalized Intersection Capacity Analysis

2: OR-224 & SE Monroe Street

09/20/2019



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	1898	14	5	988	16
Future Volume (vph)	32	10	59	5	18	24	41	1898	14	5	988	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	2019	15	5	1051	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	2019	11	5	1051	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	c0.59		0.00	0.31	
v/s Ratio Perm		c0.03			0.02				0.01			0.01
v/c Ratio		0.39			0.19		0.43	0.78	0.01	0.21	0.44	0.01
Uniform Delay, d1		39.1			38.4		40.8	6.7	2.8	43.8	5.6	3.9
Progression Factor		1.00			1.00		1.08	0.51	1.00	1.14	0.38	1.00
Incremental Delay, d2		1.9			0.7		1.9	1.6	0.0	3.7	0.5	0.0
Delay (s)		41.0			39.1		45.8	5.1	2.8	53.7	2.7	3.9
Level of Service		D			D		D	A	A	D	A	A
Approach Delay (s)		41.0			39.1			5.9			2.9	
Approach LOS		D			D			A			A	

Intersection Summary		
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.75	A
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	73.0%	13.5
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

HCM 6th Signalized Intersection Summary
 2: OR-224 & SE Monroe Street

09/20/2019



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↕	↗	↗	↕	↗
Traffic Volume (veh/h)	32	10	59	5	18	24	41	1898	14	5	988	16
Future Volume (veh/h)	32	10	59	5	18	24	41	1898	14	5	988	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1826	1826	1826	1796	1796	1796
Adj Flow Rate, veh/h	34	11	63	5	19	26	44	2019	15	5	1051	17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	2	2	2	5	5	5	7	7	7
Cap, veh/h	89	28	90	51	72	86	64	2588	1154	11	2442	1088
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.04	0.75	0.75	0.01	1.00	1.00
Sat Flow, veh/h	375	285	924	74	741	882	1739	3469	1546	1711	3413	1521
Grp Volume(v), veh/h	108	0	0	50	0	0	44	2019	15	5	1051	17
Grp Sat Flow(s),veh/h/ln	1584	0	0	1697	0	0	1739	1735	1546	1711	1706	1521
Q Serve(g_s), s	3.4	0.0	0.0	0.0	0.0	0.0	2.2	31.8	0.2	0.3	0.0	0.0
Cycle Q Clear(g_c), s	5.8	0.0	0.0	2.5	0.0	0.0	2.2	31.8	0.2	0.3	0.0	0.0
Prop In Lane	0.31		0.58	0.10		0.52	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	0	0	209	0	0	64	2588	1154	11	2442	1088
V/C Ratio(X)	0.52	0.00	0.00	0.24	0.00	0.00	0.68	0.78	0.01	0.45	0.43	0.02
Avail Cap(c_a), veh/h	364	0	0	377	0	0	129	2588	1154	95	2442	1088
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.54	0.54	0.54	0.86	0.86	0.86
Uniform Delay (d), s/veh	39.2	0.0	0.0	37.8	0.0	0.0	42.8	6.9	2.9	44.3	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.6	0.0	0.0	6.7	1.3	0.0	22.3	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	1.1	0.0	0.0	1.1	7.8	0.0	0.2	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	0.0	0.0	38.4	0.0	0.0	49.5	8.3	2.9	66.5	0.5	0.0
LnGrp LOS	D	A	A	D	A	A	D	A	A	E	A	A
Approach Vol, veh/h		108			50			2078				1073
Approach Delay, s/veh		41.3			38.4			9.1				0.8
Approach LOS		D			D			A				A
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	71.6		13.3	7.8	68.9		13.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	53.5		18.0	6.7	51.8		18.0				
Max Q Clear Time (g_c+I1), s	2.3	33.8		7.8	4.2	2.0		4.5				
Green Ext Time (p_c), s	0.0	14.9		0.4	0.0	9.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay				7.9								
HCM 6th LOS				A								

Lanes, Volumes, Timings
3: SE Oak Street & OR-224

09/20/2019

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	60	171	96	80	279	193	88	940	31	149	1663	168
Future Volume (vph)	60	171	96	80	279	193	88	940	31	149	1663	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		80	180		180	400		250	540		150
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
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
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00					0.98
Fr _t			0.850			0.850			0.850			0.850
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	3438	1538	1719	3438	1538	1719	3438	1538	1703	3406	1524
Fl _t Permitted	0.469			0.642			0.950			0.950		
Satd. Flow (perm)	845	3438	1511	1156	3438	1507	1719	3438	1538	1703	3406	1489
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			73			127			124
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		181			870			831			1978	
Travel Time (s)		4.9			23.7			14.2			33.7	
Confl. Peds. (#/hr)	5		4	4		5	1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%	6%
Adj. Flow (vph)	61	174	98	82	285	197	90	959	32	152	1697	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	174	98	82	285	197	90	959	32	152	1697	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
3: SE Oak Street & OR-224

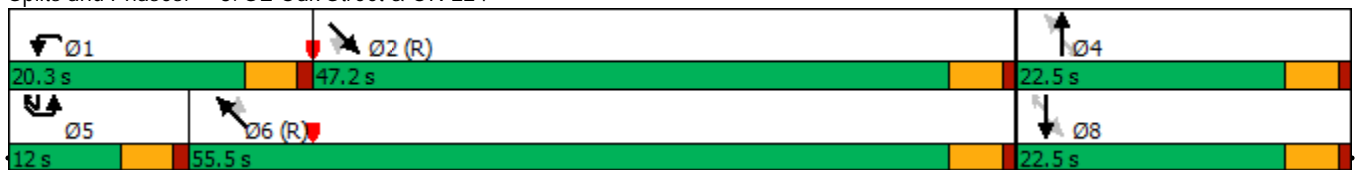
09/20/2019

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
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
Detector Phase	4	4	4	8	8	5	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	12.0	12.0	47.2	47.2	20.3	55.5	55.5
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	13.3%	13.3%	52.4%	52.4%	22.6%	61.7%	61.7%
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0	7.5	7.5	42.7	42.7	15.8	51.0	51.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	0
Act Effct Green (s)	13.2	13.2	13.2	13.2	13.2	21.9	8.7	50.6	50.6	12.7	54.6	54.6
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.24	0.10	0.56	0.56	0.14	0.61	0.61
v/c Ratio	0.49	0.34	0.30	0.48	0.56	0.46	0.54	0.50	0.03	0.63	0.82	0.18
Control Delay	48.0	35.5	5.7	44.0	39.6	18.6	47.5	9.9	0.1	25.9	28.4	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	35.5	5.7	44.0	39.6	18.6	47.5	9.9	0.1	25.9	28.4	10.2
LOS	D	D	A	D	D	B	D	A	A	C	C	B
Approach Delay		29.0			32.9			12.7			26.7	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 24.0 Intersection LOS: C
 Intersection Capacity Utilization 78.8% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 3: SE Oak Street & OR-224



























Monroe Apartments 03/07/2019 2022 Buildout Conditions - AM Peak Hour
DS

Synchro 10 Report
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HCM Signalized Intersection Capacity Analysis

3: SE Oak Street & OR-224

























09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	60	171	96	80	279	193	88	940	31	149	1663	168
Future Volume (vph)	60	171	96	80	279	193	88	940	31	149	1663	168
Ideal Flow (vphp)	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)	844	3438	1511	1156	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)	61	174	98	82	285	197	90	959	32	152	1697	171
RTOR Reduction (vph)	0	0	84	0	0	55	0	0	14	0	0	49
Lane Group Flow (vph)	61	174	14	82	285	142	90	959	18	152	1697	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	50.6	50.6	12.7	54.6	54.6
Effective Green, g (s)	13.2	13.2	13.2	13.2	13.2	21.9	8.7	50.6	50.6	12.7	54.6	54.6
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.24	0.10	0.56	0.56	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)	123	504	221	169	504	445	166	1932	864	240	2066	903
v/s Ratio Prot		0.05			c0.08	0.03	0.05	0.28		c0.09	c0.50	
v/s Ratio Perm	0.07		0.01	0.07		0.06			0.01			0.08
v/c Ratio	0.50	0.35	0.07	0.49	0.57	0.32	0.54	0.50	0.02	0.63	0.82	0.14
Uniform Delay, d1	35.3	34.5	33.1	35.3	35.7	27.9	38.8	12.0	8.7	36.5	13.9	7.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.68	1.00	0.57	1.77	3.23
Incremental Delay, d2	3.1	0.4	0.1	2.2	1.5	0.4	3.3	0.9	0.0	2.3	1.7	0.1
Delay (s)	38.5	34.9	33.2	37.5	37.2	28.3	38.0	8.9	8.8	23.1	26.2	24.6
Level of Service	D	C	C	D	D	C	D	A	A	C	C	C
Approach Delay (s)		35.1			34.1			11.4			25.8	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			23.9				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			78.8%				ICU Level of Service		D			
Analysis Period (min)			15									
c	Critical Lane Group											

HCM 6th Signalized Intersection Summary

3: SE Oak Street & OR-224

09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	60	171	96	80	279	193	88	940	31	149	1663	168
Future Volume (veh/h)	60	171	96	80	279	193	88	940	31	149	1663	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	61	174	98	82	285	197	90	959	32	152	1697	171
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	6	6	6
Cap, veh/h	168	599	265	219	599	363	114	1975	880	186	2105	938
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.07	0.57	0.57	0.11	0.61	0.61
Sat Flow, veh/h	888	3469	1534	1075	3469	1514	1739	3469	1546	1725	3441	1534
Grp Volume(v), veh/h	61	174	98	82	285	197	90	959	32	152	1697	171
Grp Sat Flow(s),veh/h/ln	888	1735	1534	1075	1735	1514	1739	1735	1546	1725	1721	1534
Q Serve(g_s), s	6.0	3.9	5.1	6.5	6.7	10.3	4.6	14.8	0.8	7.8	34.0	4.4
Cycle Q Clear(g_c), s	12.6	3.9	5.1	10.4	6.7	10.3	4.6	14.8	0.8	7.8	34.0	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	168	599	265	219	599	363	114	1975	880	186	2105	938
V/C Ratio(X)	0.36	0.29	0.37	0.37	0.48	0.54	0.79	0.49	0.04	0.82	0.81	0.18
Avail Cap(c_a), veh/h	192	694	307	248	694	404	145	1975	880	303	2105	938
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.91	0.25	0.25	0.25
Uniform Delay (d), s/veh	39.3	32.4	32.9	37.0	33.6	30.0	41.4	11.5	8.5	39.3	13.4	7.6
Incr Delay (d2), s/veh	1.3	0.3	0.9	1.1	0.6	1.3	18.2	0.8	0.1	2.3	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.7	1.9	1.8	2.8	3.8	2.5	5.1	0.3	3.3	10.9	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	32.7	33.8	38.0	34.1	31.3	59.6	12.3	8.6	41.6	14.3	7.7
LnGrp LOS	D	C	C	D	C	C	E	B	A	D	B	A
Approach Vol, veh/h		333			564			1081			2020	
Approach Delay, s/veh		34.4			33.7			16.1			15.8	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.2	55.7		20.0	10.4	59.5		20.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.8	42.7		18.0	7.5	51.0		18.0				
Max Q Clear Time (g_c+I1), s	9.8	16.8		14.6	6.6	36.0		12.4				
Green Ext Time (p_c), s	0.2	7.2		0.6	0.0	10.6		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				20.0								
HCM 6th LOS				B								

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕		↖	↕	↗
Traffic Volume (vph)	17	52	24	83	31	22	7	1829	0	110	974	19
Future Volume (vph)	17	52	24	83	31	22	7	1829	0	110	974	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	550		0	550		80
Storage Lanes	0		0	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00				0.99						
Frt		0.966				0.850						0.850
Flt Protected		0.991			0.965		0.950			0.950		
Satd. Flow (prot)	0	1759	0	0	1730	1524	1719	3438	0	1687	3374	1509
Flt Permitted		0.930			0.704		0.950			0.950		
Satd. Flow (perm)	0	1651	0	0	1262	1503	1719	3438	0	1687	3374	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				73						73
Link Speed (mph)		25			25			50				50
Link Distance (ft)		167			225			581				1978
Travel Time (s)		4.6			6.1			7.9				27.0
Confl. Peds. (#/hr)	1						1					
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	18	55	25	87	33	23	7	1925	0	116	1025	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	120	23	7	1925	0	116	1025	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

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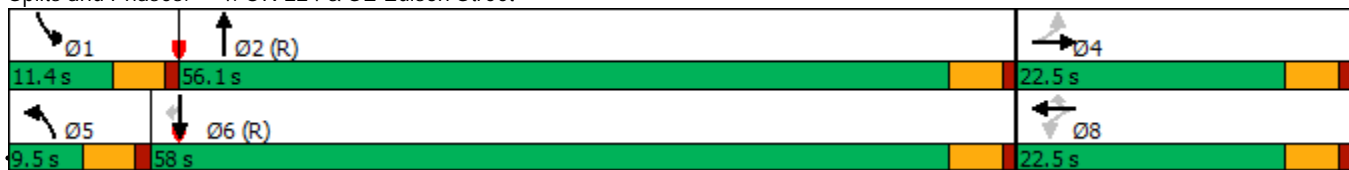


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	56.1		11.4	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%	25.0%	10.6%	62.3%		12.7%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0	18.0	5.0	51.6		6.9	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	0
Act Effct Green (s)		13.2			13.2	13.2	5.6	53.6		9.6	65.9	65.9
Actuated g/C Ratio		0.15			0.15	0.15	0.06	0.60		0.11	0.73	0.73
v/c Ratio		0.38			0.65	0.08	0.07	0.94		0.64	0.42	0.02
Control Delay		31.6			51.7	0.5	41.3	28.5		50.3	11.4	1.5
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		31.6			51.7	0.5	41.3	28.5		50.3	11.4	1.5
LOS		C			D	A	D	C		D	B	A
Approach Delay		31.6			43.5			28.5			15.1	
Approach LOS		C			D			C			B	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 24.6 Intersection LOS: C
 Intersection Capacity Utilization 80.9% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 4: OR-224 & SE Edison Street



Monroe Apartments 03/07/2019 2022 Buildout Conditions - AM Peak Hour
DS

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HCM Signalized Intersection Capacity Analysis

4: OR-224 & SE Edison Street

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


















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕		↖	↕	↗
Traffic Volume (vph)	17	52	24	83	31	22	7	1829	0	110	974	19
Future Volume (vph)	17	52	24	83	31	22	7	1829	0	110	974	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	1.00	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.99	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			1730	1503	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)		1650			1261	1503	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	55	25	87	33	23	7	1925	0	116	1025	20
RTOR Reduction (vph)	0	15	0	0	0	20	0	0	0	0	0	6
Lane Group Flow (vph)	0	83	0	0	120	3	7	1925	0	116	1025	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)		13.2			13.2	13.2	1.0	53.7		9.6	62.3	62.3
Effective Green, g (s)		13.2			13.2	13.2	1.0	53.7		9.6	62.3	62.3
Actuated g/C Ratio		0.15			0.15	0.15	0.01	0.60		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)		242			184	220	19	2051		179	2335	1044
v/s Ratio Prot							0.00	c0.56		c0.07	0.30	
v/s Ratio Perm		0.05			c0.10	0.00						0.01
v/c Ratio		0.35			0.65	0.02	0.37	0.94		0.65	0.44	0.01
Uniform Delay, d1		34.5			36.2	32.8	44.2	16.6		38.6	6.1	4.3
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.82	1.88	1.00
Incremental Delay, d2		0.9			8.0	0.0	11.7	9.9		7.1	0.5	0.0
Delay (s)		35.4			44.3	32.9	55.9	26.5		38.7	12.1	4.3
Level of Service		D			D	C	E	C		D	B	A
Approach Delay (s)		35.4			42.4			26.6			14.6	
Approach LOS		D			D			C			B	

Intersection Summary		
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.85	C
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	80.9%	13.5
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

HCM 6th Signalized Intersection Summary

4: OR-224 & SE Edison Street

09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	52	24	83	31	22	7	1829	0	110	974	19
Future Volume (veh/h)	17	52	24	83	31	22	7	1829	0	110	974	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1811	1811	1811	1826	1826	0	1796	1796	1796
Adj Flow Rate, veh/h	18	55	25	87	33	23	7	1925	0	116	1025	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	6	6	6	5	5	0	7	7	7
Cap, veh/h	56	116	43	170	53	234	16	2154	0	131	2350	1048
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.01	0.62	0.00	0.08	0.69	0.69
Sat Flow, veh/h	56	762	280	660	350	1532	1739	3561	0	1711	3413	1522
Grp Volume(v), veh/h	98	0	0	120	0	23	7	1925	0	116	1025	20
Grp Sat Flow(s),veh/h/ln	1099	0	0	1010	0	1532	1739	1735	0	1711	1706	1522
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	1.2	0.4	42.5	0.0	6.0	12.0	0.4
Cycle Q Clear(g_c), s	11.5	0.0	0.0	11.2	0.0	1.2	0.4	42.5	0.0	6.0	12.0	0.4
Prop In Lane	0.18		0.26	0.72		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	215	0	0	223	0	234	16	2154	0	131	2350	1048
V/C Ratio(X)	0.46	0.00	0.00	0.54	0.00	0.10	0.45	0.89	0.00	0.88	0.44	0.02
Avail Cap(c_a), veh/h	293	0	0	289	0	306	97	2154	0	131	2350	1048
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.87	0.87	0.87
Uniform Delay (d), s/veh	34.4	0.0	0.0	36.7	0.0	32.8	44.4	14.5	0.0	41.2	6.2	4.4
Incr Delay (d2), s/veh	1.5	0.0	0.0	2.0	0.0	0.2	19.1	6.2	0.0	41.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.0	2.7	0.0	0.4	0.2	14.2	0.0	3.9	3.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	0.0	38.7	0.0	33.0	63.5	20.8	0.0	82.7	6.8	4.5
LnGrp LOS	D	A	A	D	A	C	E	C	A	F	A	A
Approach Vol, veh/h		98			143			1932			1161	
Approach Delay, s/veh		35.9			37.8			20.9			14.3	
Approach LOS		D			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.4	60.4		18.2	5.3	66.5		18.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.9	51.6		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	8.0	44.5		13.5	2.4	14.0		13.2				
Green Ext Time (p_c), s	0.0	5.8		0.2	0.0	7.9		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				19.8								
HCM 6th LOS				B								

Lanes, Volumes, Timings

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

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↖			↕	
Traffic Volume (vph)	51	111	0	0	33	45	0	98	42	122	0	98
Future Volume (vph)	51	111	0	0	33	45	0	98	42	122	0	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		30	0		0	100		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850		0.960				0.940
Flt Protected		0.984										0.973
Satd. Flow (prot)	0	1798	0	0	3167	1417	0	1788	0	0	1721	0
Flt Permitted		0.984										0.973
Satd. Flow (perm)	0	1798	0	0	3167	1417	0	1788	0	0	1721	0
Link Speed (mph)		25			25			35				35
Link Distance (ft)		225			302			180				1370
Travel Time (s)		6.1			8.2			3.5				26.7
Confl. Bikes (#/hr)			2									
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
Heavy Vehicles (%)	4%	4%	4%	14%	14%	14%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	61	132	0	0	39	54	0	117	50	145	0	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	193	0	0	39	54	0	167	0	0	262	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

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

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↑			↕	
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	51	111	0	0	33	45	0	98	42	122	0	98
Future Volume (vph)	51	111	0	0	33	45	0	98	42	122	0	98
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)	61	132	0	0	39	54	0	117	50	145	0	117

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	193	20	20	54	167	262
Volume Left (vph)	61	0	0	0	0	145
Volume Right (vph)	0	0	0	54	50	117
Hadj (s)	0.13	0.24	0.24	-0.46	-0.15	-0.14
Departure Headway (s)	5.2	6.0	6.0	3.2	4.7	4.6
Degree Utilization, x	0.28	0.03	0.03	0.05	0.22	0.34
Capacity (veh/h)	640	538	539	1121	717	740
Control Delay (s)	10.3	8.0	8.0	5.2	9.0	9.9
Approach Delay (s)	10.3	6.4			9.0	9.9
Approach LOS	B	A			A	A

Intersection Summary

Delay	9.3
Level of Service	A
Intersection Capacity Utilization	45.8%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	125	11	21	390	20	50	143	16	21	118	159
Future Volume (vph)	123	125	11	21	390	20	50	143	16	21	118	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	110		0	0		80	0		80
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00				0.97		1.00	0.98
Frt		0.988			0.993				0.850			0.850
Flt Protected	0.950			0.950				0.987			0.992	
Satd. Flow (prot)	1656	1722	0	1752	1829	0	0	1821	1568	0	1761	1509
Flt Permitted	0.950			0.950				0.876			0.928	
Satd. Flow (perm)	1650	1722	0	1752	1829	0	0	1616	1524	0	1646	1475
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			5				109			171
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		677			337			235			394	
Travel Time (s)		18.5			9.2			6.4			10.7	
Confl. Peds. (#/hr)	4					4			5	5		
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	9%	9%	9%	3%	3%	3%	3%	3%	3%	7%	7%	7%
Adj. Flow (vph)	132	134	12	23	419	22	54	154	17	23	127	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	132	146	0	23	441	0	0	208	17	0	150	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019

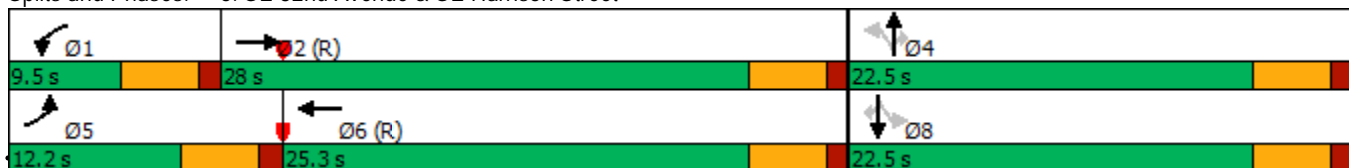


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4		8		8
Permitted Phases							4		4	8		8
Detector Phase	5	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	12.2	28.0		9.5	25.3		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	20.3%	46.7%		15.8%	42.2%		37.5%	37.5%	37.5%	37.5%	37.5%	37.5%
Maximum Green (s)	7.7	23.5		5.0	20.8		18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	8.9	36.3		5.9	27.1			12.7	12.7		12.7	12.7
Actuated g/C Ratio	0.15	0.60		0.10	0.45			0.21	0.21		0.21	0.21
v/c Ratio	0.54	0.14		0.13	0.53			0.61	0.04		0.43	0.38
Control Delay	33.6	7.5		26.8	17.6			28.4	0.2		23.3	6.1
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	33.6	7.5		26.8	17.6			28.4	0.2		23.3	6.1
LOS	C	A		C	B			C	A		C	A
Approach Delay		19.9			18.0			26.2			14.1	
Approach LOS		B			B			C			B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 18.9
 Intersection LOS: B
 Intersection Capacity Utilization 62.0%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 6: SE 32nd Avenue & SE Harrison Street



Monroe Apartments 03/07/2019 2022 Buildout Conditions - AM Peak Hour
DS

Synchro 10 Report
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HCM Signalized Intersection Capacity Analysis
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↖	↗
Traffic Volume (vph)	123	125	11	21	390	20	50	143	16	21	118	159
Future Volume (vph)	123	125	11	21	390	20	50	143	16	21	118	159
Ideal Flow (vphp)	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	1722		1752	1828			1821	1524		1761	1474
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.93	1.00
Satd. Flow (perm)	1656	1722		1752	1828			1615	1524		1647	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)	132	134	12	23	419	22	54	154	17	23	127	171
RTOR Reduction (vph)	0	4	0	0	3	0	0	0	13	0	0	135
Lane Group Flow (vph)	132	142	0	23	438	0	0	208	4	0	150	36
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	32.7		1.1	26.2			12.7	12.7		12.7	12.7
Effective Green, g (s)	7.6	32.7		1.1	26.2			12.7	12.7		12.7	12.7
Actuated g/C Ratio	0.13	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)	209	938		32	798			341	322		348	311
v/s Ratio Prot	c0.08	0.08		0.01	c0.24							
v/s Ratio Perm								c0.13	0.00		0.09	0.02
v/c Ratio	0.63	0.15		0.72	0.55			0.61	0.01		0.43	0.12
Uniform Delay, d1	24.9	6.8		29.3	12.5			21.4	18.7		20.5	19.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.1	0.3		55.4	2.7			3.1	0.0		0.9	0.2
Delay (s)	31.0	7.1		84.7	15.2			24.5	18.7		21.4	19.3
Level of Service	C	A		F	B			C	B		C	B
Approach Delay (s)		18.4			18.7			24.1			20.3	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.58	B
Actuated Cycle Length (s)	60.0	Sum of lost time (s)
Intersection Capacity Utilization	62.0%	13.5
Analysis Period (min)	15	ICU Level of Service
		B
c Critical Lane Group		

HCM 6th Signalized Intersection Summary
6: SE 32nd Avenue & SE Harrison Street











09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	125	11	21	390	20	50	143	16	21	118	159
Future Volume (veh/h)	123	125	11	21	390	20	50	143	16	21	118	159
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1856	1856	1856	1856	1856	1856	1796	1796	1796
Adj Flow Rate, veh/h	132	134	12	23	419	22	54	154	17	23	127	171
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	9	9	9	3	3	3	3	3	3	7	7	7
Cap, veh/h	166	716	64	47	658	35	76	165	468	69	257	443
Arrive On Green	0.10	0.45	0.45	0.03	0.38	0.38	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1682	1597	143	1767	1747	92	0	549	1559	0	856	1476
Grp Volume(v), veh/h	132	0	146	23	0	441	208	0	17	150	0	171
Grp Sat Flow(s),veh/h/ln	1682	0	1740	1767	0	1838	549	0	1559	856	0	1476
Q Serve(g_s), s	4.6	0.0	3.0	0.8	0.0	11.8	0.0	0.0	0.5	0.0	0.0	5.5
Cycle Q Clear(g_c), s	4.6	0.0	3.0	0.8	0.0	11.8	18.0	0.0	0.5	18.0	0.0	5.5
Prop In Lane	1.00		0.08	1.00		0.05	0.26		1.00	0.15		1.00
Lane Grp Cap(c), veh/h	166	0	780	47	0	692	240	0	468	326	0	443
V/C Ratio(X)	0.80	0.00	0.19	0.49	0.00	0.64	0.87	0.00	0.04	0.46	0.00	0.39
Avail Cap(c_a), veh/h	216	0	780	147	0	692	240	0	468	326	0	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.00	0.85	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	10.0	28.8	0.0	15.3	17.9	0.0	14.9	16.8	0.0	16.6
Incr Delay (d2), s/veh	12.5	0.0	0.5	7.7	0.0	4.4	26.6	0.0	0.0	1.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	1.1	0.4	0.0	5.3	3.9	0.0	0.2	1.6	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	0.0	10.4	36.5	0.0	19.8	44.5	0.0	14.9	17.8	0.0	17.2
LnGrp LOS	D	A	B	D	A	B	D	A	B	B	A	B
Approach Vol, veh/h		278			464			225				321
Approach Delay, s/veh		24.0			20.6			42.2				17.5
Approach LOS		C			C			D				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	31.4		22.5	10.4	27.1		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	7.7	20.8		18.0				
Max Q Clear Time (g_c+I1), s	2.8	5.0		20.0	6.6	13.8		20.0				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	1.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				24.3								
HCM 6th LOS				C								

Lanes, Volumes, Timings
7: SE Oak Street & SE Monroe Street

09/20/2019

						
Lane Group	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (vph)	123	113	64	116	345	89
Future Volume (vph)	123	113	64	116	345	89
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.913			
Flt Protected	0.950					0.962
Satd. Flow (prot)	1719	1538	1668	0	0	1775
Flt Permitted	0.950					0.962
Satd. Flow (perm)	1719	1538	1668	0	0	1775
Link Speed (mph)	25		25			25
Link Distance (ft)	870		163			887
Travel Time (s)	23.7		4.4			24.2
Confl. Peds. (#/hr)	1	2				
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	4%	4%	3%	3%
Adj. Flow (vph)	140	128	73	132	392	101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	140	128	205	0	0	493
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Stop			Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

7: SE Oak Street & SE Monroe Street


















09/20/2019



Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	123	113	64	116	345	89
Future Volume (Veh/h)	123	113	64	116	345	89
Sign Control	Free		Stop		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	140	128	73	132	392	101
Pedestrians			1			2
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					
Median storage (veh)						
Upstream signal (ft)	870					
pX, platoon unblocked						
vC, conflicting volume	1		411	1	450	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1		411	1	450	283
tC, single (s)	4.1		6.5	6.2	7.1	6.5
tC, 2 stage (s)						
tF (s)	2.2		4.0	3.3	3.5	4.0
p0 queue free %	91		85	88	0	82
cM capacity (veh/h)	1601		480	1077	373	568
Direction, Lane #	NB 1	NB 2	SE 1	NW 1		
Volume Total	140	128	205	493		
Volume Left	140	0	0	392		
Volume Right	0	128	132	0		
cSH	1601	1700	746	401		
Volume to Capacity	0.09	0.08	0.27	1.23		
Queue Length 95th (ft)	7	0	28	512		
Control Delay (s)	7.5	0.0	11.6	152.4		
Lane LOS	A		B	F		
Approach Delay (s)	3.9		11.6	152.4		
Approach LOS			B	F		
Intersection Summary						
Average Delay			81.3			
Intersection Capacity Utilization			51.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
8: SE 37th Avenue & SE Monroe Street

09/20/2019


















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	98	82	60	226	1	171	37	48	1	60	30
Future Volume (vph)	4	98	82	60	226	1	171	37	48	1	60	30
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.940						0.916			0.955	
Flt Protected		0.999			0.990		0.950					
Satd. Flow (prot)	0	1699	0	0	1826	0	1736	1673	0	0	1728	0
Flt Permitted		0.999			0.990		0.950					
Satd. Flow (perm)	0	1699	0	0	1826	0	1736	1673	0	0	1728	0
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		887			352			518			331	
Travel Time (s)		24.2			9.6			10.1			9.0	
Confl. Peds. (#/hr)			3	3			3		1	1		3
Confl. Bikes (#/hr)									1			
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
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	4	110	92	67	254	1	192	42	54	1	67	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	206	0	0	322	0	192	96	0	0	102	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.2%
ICU Level of Service	A
Analysis Period (min)	15

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

09/20/2019

												
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	60	226	1	171	37	48	1	60	30
Future Volume (vph)	4	98	82	60	226	1	171	37	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	67	254	1	192	42	54	1	67	34
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	206	322	192	96	102							
Volume Left (vph)	4	67	192	0	1							
Volume Right (vph)	92	1	0	54	34							
Hadj (s)	-0.18	0.09	0.57	-0.33	-0.11							
Departure Headway (s)	5.4	5.5	6.7	5.8	5.9							
Degree Utilization, x	0.31	0.49	0.36	0.15	0.17							
Capacity (veh/h)	611	623	497	576	533							
Control Delay (s)	10.8	13.6	12.2	8.7	10.1							
Approach Delay (s)	10.8	13.6	11.0		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 6th AWSC
8: SE 37th Avenue & SE Monroe Street

09/20/2019

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	4	98	82	60	226	1	171	37	48	1	60	30
Future Vol, veh/h	4	98	82	60	226	1	171	37	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
Heavy Vehicles, %	5	5	5	3	3	3	4	4	4	5	5	5
Mvmt Flow	4	110	92	67	254	1	192	42	54	1	67	34
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.9	13.7	11.9	10.2
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	2%	21%	1%
Vol Thru, %	0%	44%	53%	79%	66%
Vol Right, %	0%	56%	45%	0%	33%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	171	85	184	287	91
LT Vol	171	0	4	60	1
Through Vol	0	37	98	226	60
RT Vol	0	48	82	1	30
Lane Flow Rate	192	96	207	322	102
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.357	0.154	0.311	0.491	0.168
Departure Headway (Hd)	6.698	5.789	5.411	5.476	5.911
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	536	618	662	658	604
Service Time	4.445	3.536	3.462	3.52	3.971
HCM Lane V/C Ratio	0.358	0.155	0.313	0.489	0.169
HCM Control Delay	13.1	9.6	10.9	13.7	10.2
HCM Lane LOS	B	A	B	B	B
HCM 95th-tile Q	1.6	0.5	1.3	2.7	0.6

Lanes, Volumes, Timings
 9: SE 37th Avenue & SE Washington Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	23	1	35	10	1	3	13	204	3	1	197	8
Future Volume (vph)	23	1	35	10	1	3	13	204	3	1	197	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.919			0.973			0.998			0.995	
Flt Protected		0.981			0.965			0.997				
Satd. Flow (prot)	0	1679	0	0	1784	0	0	1835	0	0	1890	0
Flt Permitted		0.981			0.965			0.997				
Satd. Flow (perm)	0	1679	0	0	1784	0	0	1835	0	0	1890	0
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		244			271			186			518	
Travel Time (s)		6.7			7.4			3.6			10.1	
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)												2
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
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	3%	3%	3%	0%	0%	0%
Adj. Flow (vph)	26	1	40	11	1	3	15	232	3	1	224	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	15	0	0	250	0	0	234	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	30.8%						ICU Level of Service A					
Analysis Period (min)	15											

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

09/20/2019



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	204	3	1	197	8
Future Volume (Veh/h)	23	1	35	10	1	3	13	204	3	1	197	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	232	3	1	224	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	496	230	536	500	234	233			236		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	498	496	230	536	500	234	233			236		
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)	476	469	809	430	470	809	1329			1342		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	67	15	250	234								
Volume Left	26	11	15	1								
Volume Right	40	3	3	9								
cSH	631	477	1329	1342								
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										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			30.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM 6th TWSC
 9: SE 37th Avenue & SE Washington Street

09/20/2019

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	1	35	10	1	3	13	204	3	1	197	8
Future Vol, veh/h	23	1	35	10	1	3	13	204	3	1	197	8
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	0	0	0	3	3	3	0	0	0
Mvmt Flow	26	1	40	11	1	3	15	232	3	1	224	9

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	497	497	230	517	500	235	233	0	0	236	0	0
Stage 1	231	231	-	265	265	-	-	-	-	-	-	-
Stage 2	266	266	-	252	235	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	483	475	809	472	476	809	1329	-	-	1343	-	-
Stage 1	772	713	-	745	693	-	-	-	-	-	-	-
Stage 2	739	689	-	757	714	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	475	468	808	442	469	808	1329	-	-	1342	-	-
Mov Cap-2 Maneuver	475	468	-	442	469	-	-	-	-	-	-	-
Stage 1	762	712	-	735	683	-	-	-	-	-	-	-
Stage 2	725	679	-	717	713	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	11.4		12.6		0.5			0		
HCM LOS	B		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1329	-	-	628	492	1342	-
HCM Lane V/C Ratio	0.011	-	-	0.107	0.032	0.001	-
HCM Control Delay (s)	7.7	0	-	11.4	12.6	7.7	0
HCM Lane LOS	A	A	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0	-

Lanes, Volumes, Timings
 10: SE 37th Avenue & SE Railroad Avenue

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	162	145	94	33	64	180
Future Volume (vph)	162	145	94	33	64	180
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	30		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.965			
Flt Protected	0.950					0.987
Satd. Flow (prot)	1770	1583	1780	0	0	1821
Flt Permitted	0.950					0.987
Satd. Flow (perm)	1770	1583	1780	0	0	1821
Link Speed (mph)	35		35			35
Link Distance (ft)	419		1370			186
Travel Time (s)	8.2		26.7			3.6
Confl. Peds. (#/hr)		1				
Confl. Bikes (#/hr)		2				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Adj. Flow (vph)	178	159	103	36	70	198
Shared Lane Traffic (%)						
Lane Group Flow (vph)	178	159	139	0	0	268
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

10: SE 37th Avenue & SE Railroad Avenue

09/20/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	162	145	94	33	64	180
Future Volume (Veh/h)	162	145	94	33	64	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)	178	159	103	36	70	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	459	122			139	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	459	122			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 %	67	83			95	
cM capacity (veh/h)	533	928			1438	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	337	139	268			
Volume Left	178	0	70			
Volume Right	159	36	0			
cSH	838	1700	1438			
Volume to Capacity	0.40	0.08	0.05			
Queue Length 95th (ft)	49	0	4			
Control Delay (s)	12.2	0.0	2.3			
Lane LOS	B		A			
Approach Delay (s)	12.2	0.0	2.3			
Approach LOS	B					
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			39.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM 6th TWSC
10: SE 37th Avenue & SE Railroad Avenue

09/20/2019

Intersection						
Int Delay, s/veh	6.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	162	145	94	33	64	180
Future Vol, veh/h	162	145	94	33	64	180
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	30	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	3	3	3	3
Mvmt Flow	178	159	103	36	70	198

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	459	122	0	0	139	0
Stage 1	121	-	-	-	-	-
Stage 2	338	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.13	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.227	-
Pot Cap-1 Maneuver	560	929	-	-	1438	-
Stage 1	904	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	529	928	-	-	1438	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	904	-	-	-	-	-
Stage 2	682	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	529	928	1438
HCM Lane V/C Ratio	-	-	0.337	0.172	0.049
HCM Control Delay (s)	-	-	15.2	9.7	7.6
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.5	0.6	0.2

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕		↗	↕↕	↗	↗	↗	↕↕	↗
Traffic Volume (vph)	13	279	62	70	197	183	70	1478	86	329	1769	39	
Future Volume (vph)	13	279	62	70	197	183	70	1478	86	329	1769	39	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		200	0		200	170		200	640		160	
Storage Lanes	0		1	0		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Ped Bike Factor		1.00			0.99		1.00		0.99	1.00		0.99	
Frt		0.974			0.939				0.850			0.850	
Flt Protected		0.998			0.992		0.950			0.950			
Satd. Flow (prot)	0	3330	0	0	3206	0	1752	3505	1568	1752	3505	1568	
Flt Permitted		0.902			0.710		0.950			0.950			
Satd. Flow (perm)	0	3009	0	0	2293	0	1752	3505	1545	1752	3505	1547	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		25			172				127			73	
Link Speed (mph)		25			25			40				40	
Link Distance (ft)		532			677			514				440	
Travel Time (s)		14.5			18.5			8.8				7.5	
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1	
Confl. Bikes (#/hr)			3						2				
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%	
Adj. Flow (vph)	13	288	64	72	203	189	72	1524	89	339	1824	40	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	365	0	0	464	0	72	1524	89	339	1824	40	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		0			0			12				12	
Link Offset(ft)		0			0			0				0	
Crosswalk Width(ft)		16			16			16				16	
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15		9	15		9	15		9	15		9	
Number of Detectors	1	2		1	2		1	2	1	1	2	1	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel													
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94				94	
Detector 2 Size(ft)		6			6			6				6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex	
Detector 2 Channel													

Lanes, Volumes, Timings
1: OR-224 & SE Harrison Street

09/20/2019

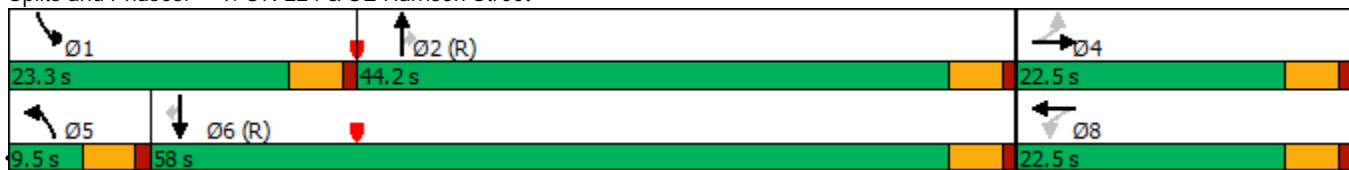


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		9.5	44.2	44.2	23.3	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		10.6%	49.1%	49.1%	25.9%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0		5.0	39.7	39.7	18.8	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)		15.9			15.9		6.0	41.3	41.3	19.4	56.9	56.9
Actuated g/C Ratio		0.18			0.18		0.07	0.46	0.46	0.22	0.63	0.63
v/c Ratio		0.66			0.85		0.62	0.95	0.11	0.90	0.82	0.04
Control Delay		38.0			37.8		55.7	34.2	4.0	63.4	18.3	0.7
Queue Delay		0.0			0.1		0.0	0.9	0.0	0.0	0.9	0.0
Total Delay		38.0			37.9		55.7	35.0	4.0	63.4	19.2	0.7
LOS		D			D		E	D	A	E	B	A
Approach Delay		38.0			37.9			34.3			25.7	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 30.9
 Intersection LOS: C
 Intersection Capacity Utilization 98.7%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 1: OR-224 & SE Harrison Street



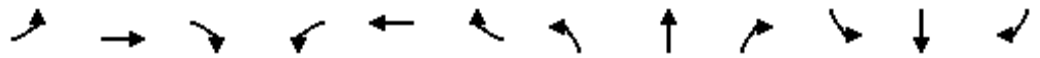
Monroe Apartments 03/07/2019 2022 Buildout Conditions - PM Peak Hour
DS

Synchro 10 Report
Page 2

HCM Signalized Intersection Capacity Analysis

1: OR-224 & SE Harrison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↕↕	↗	↗	↕↕	↗
Traffic Volume (vph)	13	279	62	70	197	183	70	1478	86	329	1769	39
Future Volume (vph)	13	279	62	70	197	183	70	1478	86	329	1769	39
Ideal Flow (vphp)	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)		3329			3205		1752	3505	1545	1752	3505	1547
Flt Permitted		0.90			0.71		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3009			2293		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)	13	288	64	72	203	189	72	1524	89	339	1824	40
RTOR Reduction (vph)	0	21	0	0	142	0	0	0	48	0	0	15
Lane Group Flow (vph)	0	344	0	0	322	0	72	1524	41	339	1824	25
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)		15.9			15.9		4.7	41.2	41.2	19.4	55.9	55.9
Effective Green, g (s)		15.9			15.9		4.7	41.2	41.2	19.4	55.9	55.9
Actuated g/C Ratio		0.18			0.18		0.05	0.46	0.46	0.22	0.62	0.62
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)		531			405		91	1604	707	377	2176	960
v/s Ratio Prot							0.04	c0.43		c0.19	0.52	
v/s Ratio Perm		0.11			c0.14				0.03			0.02
v/c Ratio		0.65			0.80		0.79	0.95	0.06	0.90	0.84	0.03
Uniform Delay, d1		34.5			35.5		42.2	23.4	13.6	34.3	13.5	6.6
Progression Factor		1.00			1.00		0.83	0.92	3.09	1.00	1.00	1.00
Incremental Delay, d2		2.7			10.4		29.5	11.1	0.1	23.2	4.1	0.0
Delay (s)		37.2			45.9		64.3	32.6	42.1	57.6	17.5	6.6
Level of Service		D			D		E	C	D	E	B	A
Approach Delay (s)		37.2			45.9			34.5			23.5	
Approach LOS		D			D			C			C	





















Intersection Summary

HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary

1: OR-224 & SE Harrison Street

09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	279	62	70	197	183	70	1478	86	329	1769	39
Future Volume (veh/h)	13	279	62	70	197	183	70	1478	86	329	1769	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	13	288	64	72	203	189	72	1524	89	339	1824	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	3	3	3	3	3	3
Cap, veh/h	49	481	111	96	205	237	92	1555	684	369	2108	940
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.05	0.44	0.44	0.21	0.60	0.60
Sat Flow, veh/h	29	2404	557	218	1025	1186	1767	3526	1551	1767	3526	1572
Grp Volume(v), veh/h	187	0	178	233	0	231	72	1524	89	339	1824	40
Grp Sat Flow(s),veh/h/ln	1445	0	1545	981	0	1449	1767	1763	1551	1767	1763	1572
Q Serve(g_s), s	0.4	0.0	9.3	8.7	0.0	13.6	3.6	38.3	3.1	16.9	38.8	0.9
Cycle Q Clear(g_c), s	14.1	0.0	9.3	18.0	0.0	13.6	3.6	38.3	3.1	16.9	38.8	0.9
Prop In Lane	0.07		0.36	0.31		0.82	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	332	0	309	249	0	290	92	1555	684	369	2108	940
V/C Ratio(X)	0.57	0.00	0.57	0.94	0.00	0.80	0.78	0.98	0.13	0.92	0.87	0.04
Avail Cap(c_a), veh/h	332	0	309	249	0	290	98	1555	684	369	2108	940
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.91	0.00	0.91	0.72	0.72	0.72	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	0.0	32.5	38.4	0.0	34.3	42.1	24.8	14.9	34.8	15.1	7.5
Incr Delay (d2), s/veh	2.2	0.0	2.6	38.2	0.0	13.2	23.6	15.2	0.3	27.4	5.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	3.7	7.8	0.0	5.8	2.1	17.5	1.1	9.7	14.2	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.4	0.0	35.1	76.6	0.0	47.4	65.7	39.9	15.2	62.2	20.1	7.6
LnGrp LOS	C	A	D	E	A	D	E	D	B	E	C	A
Approach Vol, veh/h		365			464			1685			2203	
Approach Delay, s/veh		34.7			62.1			39.7			26.4	
Approach LOS		C			E			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.3	44.2		22.5	9.2	58.3		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.8	39.7		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	18.9	40.3		16.1	5.6	40.8		20.0				
Green Ext Time (p_c), s	0.0	0.0		0.4	0.0	9.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				35.3								
HCM 6th LOS				D								

Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Traffic Volume (vph)	29	31	85	16	20	21	33	1595	14	22	1863	24
Future Volume (vph)	29	31	85	16	20	21	33	1595	14	22	1863	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	240		260	150		250
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			0.99		1.00					0.97
Frt		0.921			0.950				0.850			0.850
Flt Protected		0.990			0.987		0.950			0.950		
Satd. Flow (prot)	0	1666	0	0	1773	0	1752	3505	1568	1752	3505	1568
Flt Permitted		0.936			0.819		0.950			0.950		
Satd. Flow (perm)	0	1574	0	0	1470	0	1751	3505	1568	1752	3505	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71			22				73			73
Link Speed (mph)		25			25			40				40
Link Distance (ft)		550			530			831				514
Travel Time (s)		15.0			14.5			14.2				8.8
Confl. Peds. (#/hr)	1		3	3		1	4					4
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	30	32	88	16	21	22	34	1644	14	23	1921	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	59	0	34	1644	14	23	1921	25
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: OR-224 & SE Monroe Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		9.5	58.0	58.0	9.5	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		10.6%	64.4%	64.4%	10.6%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0		5.0	53.5	53.5	5.0	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effect Green (s)		10.3			10.3		6.8	66.0	66.0	6.5	63.5	63.5
Actuated g/C Ratio		0.11			0.11		0.08	0.73	0.73	0.07	0.71	0.71
v/c Ratio		0.62			0.32		0.26	0.64	0.01	0.18	0.78	0.02
Control Delay		31.2			28.6		41.8	5.2	0.0	55.5	6.8	0.0
Queue Delay		0.0			0.0		0.0	0.1	0.0	0.0	0.5	0.0
Total Delay		31.3			28.6		41.8	5.2	0.0	55.5	7.4	0.0
LOS		C			C		D	A	A	E	A	A
Approach Delay		31.3			28.6			5.9			7.8	
Approach LOS		C			C			A			A	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 8.2
 Intersection LOS: A
 Intersection Capacity Utilization 69.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: OR-224 & SE Monroe Street



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

09/20/2019



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	1595	14	22	1863	24
Future Volume (vph)	29	31	85	16	20	21	33	1595	14	22	1863	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	1644	14	23	1921	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	1644	10	23	1921	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	0.47		0.01	c0.55	
v/s Ratio Perm		c0.06			0.03				0.01			0.01
v/c Ratio		0.48			0.24		0.39	0.67	0.01	0.41	0.80	0.02
Uniform Delay, d1		37.4			36.3		41.4	7.5	4.0	42.7	9.8	4.5
Progression Factor		1.00			1.00		1.00	0.53	1.00	1.37	0.40	1.00
Incremental Delay, d2		2.0			0.7		1.6	0.8	0.0	2.7	1.6	0.0
Delay (s)		39.4			37.0		43.0	4.8	4.0	61.3	5.6	4.5
Level of Service		D			D		D	A	A	E	A	A
Approach Delay (s)		39.4			37.0			5.6			6.2	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.7									A
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			90.0							13.5		
Intersection Capacity Utilization			69.8%									C
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th Signalized Intersection Summary
 2: OR-224 & SE Monroe Street

09/20/2019



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↕	↗	↗	↕	↗
Traffic Volume (veh/h)	29	31	85	16	20	21	33	1595	14	22	1863	24
Future Volume (veh/h)	29	31	85	16	20	21	33	1595	14	22	1863	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1900	1900	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	30	32	88	16	21	22	34	1644	14	23	1921	25
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	0	0	0	3	3	3	3	3	3
Cap, veh/h	75	55	115	86	101	81	56	2477	1102	43	2451	1090
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.03	0.70	0.70	0.05	1.00	1.00
Sat Flow, veh/h	217	443	937	283	818	655	1767	3526	1568	1767	3526	1568
Grp Volume(v), veh/h	150	0	0	59	0	0	34	1644	14	23	1921	25
Grp Sat Flow(s),veh/h/ln	1596	0	0	1756	0	0	1767	1763	1568	1767	1763	1568
Q Serve(g_s), s	4.7	0.0	0.0	0.0	0.0	0.0	1.7	23.4	0.2	1.1	0.0	0.0
Cycle Q Clear(g_c), s	8.1	0.0	0.0	2.7	0.0	0.0	1.7	23.4	0.2	1.1	0.0	0.0
Prop In Lane	0.20		0.59	0.27		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	0	0	267	0	0	56	2477	1102	43	2451	1090
V/C Ratio(X)	0.61	0.00	0.00	0.22	0.00	0.00	0.60	0.66	0.01	0.54	0.78	0.02
Avail Cap(c_a), veh/h	365	0	0	389	0	0	98	2477	1102	98	2451	1090
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.49	0.49	0.49	0.46	0.46	0.46
Uniform Delay (d), s/veh	38.1	0.0	0.0	35.8	0.0	0.0	43.0	7.5	4.0	42.3	0.0	0.0
Incr Delay (d2), s/veh	2.5	0.0	0.0	0.4	0.0	0.0	5.0	0.7	0.0	4.7	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.0	1.2	0.0	0.0	0.8	6.5	0.1	0.5	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	0.0	0.0	36.2	0.0	0.0	48.1	8.2	4.0	47.0	1.2	0.0
LnGrp LOS	D	A	A	D	A	A	D	A	A	D	A	A
Approach Vol, veh/h		150			59			1692				1969
Approach Delay, s/veh		40.6			36.2			8.9				1.7
Approach LOS		D			D			A				A
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	67.7		15.6	7.4	67.1		15.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	53.5		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	3.1	25.4		10.1	3.7	2.0		4.7				
Green Ext Time (p_c), s	0.0	15.0		0.5	0.0	25.9		0.2				

Intersection Summary

HCM 6th Ctrl Delay	6.9
HCM 6th LOS	A

Lanes, Volumes, Timings
3: SE Oak Street & OR-224

09/20/2019

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	35	214	88	129	246	139	227	1695	64	113	1476	173
Future Volume (vph)	35	214	88	129	246	139	227	1695	64	113	1476	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		80	180		180	400		250	540		150
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
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
Ped Bike Factor	1.00		0.97	0.99		0.98	1.00		0.99	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	1752	3505	1568	1752	3505	1568	1770	3539	1583
Flt Permitted	0.521			0.574			0.950			0.950		
Satd. Flow (perm)	949	3471	1506	1048	3505	1542	1750	3505	1547	1769	3539	1531
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			18			73			127
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		181			870			831			1978	
Travel Time (s)		4.9			23.7			14.2			33.7	
Confl. Peds. (#/hr)	3		10	10		3	5		1	1		5
Confl. Bikes (#/hr)			3									1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	38	230	95	139	265	149	244	1823	69	122	1587	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	230	95	139	265	149	244	1823	69	122	1587	186
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
 3: SE Oak Street & OR-224

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Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
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
Detector Phase	4	4	4	8	8	5	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	19.0	19.0	55.5	55.5	12.0	48.5	48.5
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	21.1%	21.1%	61.7%	61.7%	13.3%	53.9%	53.9%
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0	14.5	14.5	51.0	51.0	7.5	44.0	44.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
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
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0	0		0	0
Act Effct Green (s)	15.4	15.4	15.4	15.4	15.4	30.1	14.8	52.7	52.7	8.5	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
v/c Ratio	0.24	0.39	0.26	0.78	0.44	0.28	0.85	0.89	0.07	0.73	0.87	0.22
Control Delay	34.7	34.4	4.7	63.9	35.3	17.3	59.0	17.4	4.5	51.4	33.1	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	34.4	4.7	63.9	35.3	17.3	59.0	17.4	4.5	51.4	33.1	13.5
LOS	C	C	A	E	D	B	E	B	A	D	C	B
Approach Delay		26.7			37.6			21.7			32.3	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 27.9
 Intersection LOS: C
 Intersection Capacity Utilization 84.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 3: SE Oak Street & OR-224



























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 DS

Synchro 10 Report
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HCM Signalized Intersection Capacity Analysis

3: SE Oak Street & OR-224

























09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	35	214	88	129	246	139	227	1695	64	113	1476	173
Future Volume (vph)	35	214	88	129	246	139	227	1695	64	113	1476	173
Ideal Flow (vphp)	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	0.57	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	949	3471	1506	1047	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)	38	230	95	139	265	149	244	1823	69	122	1587	186
RTOR Reduction (vph)	0	0	79	0	0	12	0	0	29	0	0	62
Lane Group Flow (vph)	38	230	16	139	265	137	244	1823	40	122	1587	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	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	52.6	52.6	8.5	46.3	46.3
Effective Green, g (s)	15.4	15.4	15.4	15.4	15.4	30.2	14.8	52.6	52.6	8.5	46.3	46.3
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17	0.34	0.16	0.58	0.58	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)	162	593	257	179	599	599	288	2048	904	167	1820	787
v/s Ratio Prot		0.07			0.08	0.04	c0.14	c0.52		0.07	0.45	
v/s Ratio Perm	0.04		0.01	c0.13		0.05			0.03			0.08
v/c Ratio	0.23	0.39	0.06	0.78	0.44	0.23	0.85	0.89	0.04	0.73	0.87	0.16
Uniform Delay, d1	32.2	33.1	31.3	35.7	33.4	21.5	36.5	16.2	8.0	39.6	19.2	11.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.05	0.72	1.98	0.70	1.39	2.71
Incremental Delay, d2	0.7	0.4	0.1	18.8	0.5	0.2	14.6	4.5	0.1	11.8	4.7	0.3
Delay (s)	33.0	33.5	31.4	54.4	34.0	21.7	53.0	16.2	15.8	39.5	31.6	31.6
Level of Service	C	C	C	D	C	C	D	B	B	D	C	C
Approach Delay (s)		32.9			35.8			20.4			32.1	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.5				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			84.0%				ICU Level of Service		E			
Analysis Period (min)			15									
c	Critical Lane Group											

HCM 6th Signalized Intersection Summary

3: SE Oak Street & OR-224

09/20/2019

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	35	214	88	129	246	139	227	1695	64	113	1476	173
Future Volume (veh/h)	35	214	88	129	246	139	227	1695	64	113	1476	173
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1856	1856	1856	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	38	230	95	139	265	149	244	1823	69	122	1587	186
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	3	3	3	3	3	3	2	2	2
Cap, veh/h	208	699	303	229	705	557	278	1998	887	148	1751	769
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.16	0.57	0.57	0.08	0.49	0.49
Sat Flow, veh/h	950	3497	1513	1038	3526	1549	1767	3526	1566	1781	3554	1561
Grp Volume(v), veh/h	38	230	95	139	265	149	244	1823	69	122	1587	186
Grp Sat Flow(s),veh/h/ln	950	1749	1513	1038	1763	1549	1767	1763	1566	1781	1777	1561
Q Serve(g_s), s	3.2	5.1	4.8	11.9	5.9	6.2	12.2	41.8	1.8	6.1	36.8	6.2
Cycle Q Clear(g_c), s	9.1	5.1	4.8	17.0	5.9	6.2	12.2	41.8	1.8	6.1	36.8	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208	699	303	229	705	557	278	1998	887	148	1751	769
V/C Ratio(X)	0.18	0.33	0.31	0.61	0.38	0.27	0.88	0.91	0.08	0.82	0.91	0.24
Avail Cap(c_a), veh/h	208	699	303	229	705	557	285	1998	887	148	1751	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.54	0.54	0.54	0.63	0.63	0.63
Uniform Delay (d), s/veh	35.1	30.8	30.7	38.1	31.1	20.6	37.1	17.5	8.8	40.6	20.9	13.1
Incr Delay (d2), s/veh	0.4	0.3	0.6	4.5	0.3	0.3	15.3	4.5	0.1	20.3	5.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.2	1.8	3.3	2.5	2.2	6.2	15.4	0.6	3.4	14.7	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.5	31.1	31.3	42.6	31.5	20.8	52.4	22.0	8.9	60.9	26.4	13.6
LnGrp LOS	D	C	C	D	C	C	D	C	A	E	C	B
Approach Vol, veh/h		363			553			2136			1895	
Approach Delay, s/veh		31.6			31.4			25.1			27.4	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	55.5		22.5	18.6	48.9		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	51.0		18.0	14.5	44.0		18.0				
Max Q Clear Time (g_c+I1), s	8.1	43.8		11.1	14.2	38.8		19.0				
Green Ext Time (p_c), s	0.0	6.0		1.1	0.0	4.2		0.0				
Intersection Summary												
HCM 6th Ctrl Delay					27.2							
HCM 6th LOS					C							

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕		↖	↕	↗
Traffic Volume (vph)	18	84	14	121	64	85	31	1522	0	62	1834	19
Future Volume (vph)	18	84	14	121	64	85	31	1522	0	62	1834	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	550		0	550		80
Storage Lanes	0		0	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00	0.99				1.00		
Frt		0.984				0.850						0.850
Flt Protected		0.992			0.968		0.950			0.950		
Satd. Flow (prot)	0	1833	0	0	1821	1599	1770	3539	0	1736	3471	1553
Flt Permitted		0.933			0.681		0.950			0.950		
Satd. Flow (perm)	0	1724	0	0	1280	1578	1770	3539	0	1735	3471	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				90						73
Link Speed (mph)		25			25			50				50
Link Distance (ft)		167			225			581				1978
Travel Time (s)		4.6			6.1			7.9				27.0
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)						1			1			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	19	89	15	129	68	90	33	1619	0	66	1951	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	123	0	0	197	90	33	1619	0	66	1951	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings
4: OR-224 & SE Edison Street

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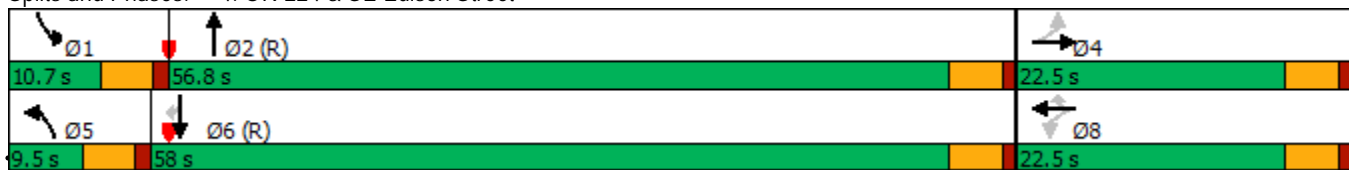


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5	22.5	9.5	56.8		10.7	58.0	58.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%	25.0%	10.6%	63.1%		11.9%	64.4%	64.4%
Maximum Green (s)	18.0	18.0		18.0	18.0	18.0	5.0	52.3		6.2	53.5	53.5
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	0
Act Effct Green (s)		16.5			16.5	16.5	5.3	55.7		6.4	58.8	58.8
Actuated g/C Ratio		0.18			0.18	0.18	0.06	0.62		0.07	0.65	0.65
v/c Ratio		0.38			0.84	0.25	0.32	0.74		0.54	0.86	0.02
Control Delay		33.6			65.6	8.9	49.2	15.9		45.0	15.4	0.4
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		33.6			65.6	8.9	49.2	15.9		45.0	15.4	0.4
LOS		C			E	A	D	B		D	B	A
Approach Delay		33.6			47.8			16.5			16.2	
Approach LOS		C			D			B			B	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 19.1
 Intersection LOS: B
 Intersection Capacity Utilization 75.8%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 4: OR-224 & SE Edison Street



Monroe Apartments 03/07/2019 2022 Buildout Conditions - PM Peak Hour
DS

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HCM Signalized Intersection Capacity Analysis

4: OR-224 & SE Edison Street

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕		↖	↕	↗
Traffic Volume (vph)	18	84	14	121	64	85	31	1522	0	62	1834	19
Future Volume (vph)	18	84	14	121	64	85	31	1522	0	62	1834	19
Ideal Flow (vphp)	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	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00	0.99	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)		1833			1820	1578	1770	3539		1736	3471	1553
Flt Permitted		0.93			0.68	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1724			1279	1578	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	89	15	129	68	90	33	1619	0	66	1951	20
RTOR Reduction (vph)	0	6	0	0	0	74	0	0	0	0	0	7
Lane Group Flow (vph)	0	117	0	0	197	17	33	1619	0	66	1951	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	54.8		5.2	57.0	57.0
Effective Green, g (s)		16.5			16.5	16.5	3.0	54.8		5.2	57.0	57.0
Actuated g/C Ratio		0.18			0.18	0.18	0.03	0.61		0.06	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			234	289	59	2154		100	2198	983
v/s Ratio Prot							0.02	0.46		c0.04	c0.56	
v/s Ratio Perm		0.07			c0.15	0.01						0.01
v/c Ratio		0.37			0.84	0.06	0.56	0.75		0.66	0.89	0.01
Uniform Delay, d1		32.2			35.5	30.3	42.8	12.7		41.5	13.8	6.1
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.87	0.85	1.00
Incremental Delay, d2		0.7			23.0	0.1	11.0	2.5		8.0	3.1	0.0
Delay (s)		32.9			58.5	30.4	53.9	15.2		44.1	14.9	6.1
Level of Service		C			E	C	D	B		D	B	A
Approach Delay (s)		32.9			49.7			15.9			15.8	
Approach LOS		C			D			B			B	






















Intersection Summary

HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary

4: OR-224 & SE Edison Street

09/20/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	84	14	121	64	85	31	1522	0	62	1834	19
Future Volume (veh/h)	18	84	14	121	64	85	31	1522	0	62	1834	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1870	1870	0	1841	1841	1841
Adj Flow Rate, veh/h	19	89	15	129	68	90	33	1619	0	66	1951	20
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	0	4	4	4
Cap, veh/h	46	153	21	155	54	315	56	2139	0	84	2164	964
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.03	0.60	0.00	0.05	0.62	0.62
Sat Flow, veh/h	0	765	106	445	269	1574	1781	3647	0	1753	3497	1559
Grp Volume(v), veh/h	123	0	0	197	0	90	33	1619	0	66	1951	20
Grp Sat Flow(s),veh/h/ln	872	0	0	714	0	1574	1781	1777	0	1753	1749	1559
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	4.4	1.6	30.0	0.0	3.4	43.3	0.4
Cycle Q Clear(g_c), s	18.0	0.0	0.0	18.0	0.0	4.4	1.6	30.0	0.0	3.4	43.3	0.4
Prop In Lane	0.15		0.12	0.65		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	0	0	209	0	315	56	2139	0	84	2164	964
V/C Ratio(X)	0.56	0.00	0.00	0.94	0.00	0.29	0.59	0.76	0.00	0.78	0.90	0.02
Avail Cap(c_a), veh/h	220	0	0	209	0	315	99	2139	0	121	2164	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.41	0.41	0.41
Uniform Delay (d), s/veh	31.4	0.0	0.0	38.3	0.0	30.5	43.0	13.1	0.0	42.4	14.8	6.6
Incr Delay (d2), s/veh	3.1	0.0	0.0	46.2	0.0	0.5	9.7	2.6	0.0	8.4	2.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	7.1	0.0	1.7	0.8	9.9	0.0	1.6	13.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	0.0	0.0	84.4	0.0	31.0	52.7	15.7	0.0	50.7	17.7	6.6
LnGrp LOS	C	A	A	F	A	C	D	B	A	D	B	A
Approach Vol, veh/h		123			287			1652			2037	
Approach Delay, s/veh		34.5			67.7			16.4			18.7	
Approach LOS		C			E			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	58.7		22.5	7.3	60.2		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.2	52.3		18.0	5.0	53.5		18.0				
Max Q Clear Time (g_c+I1), s	5.4	32.0		20.0	3.6	45.3		20.0				
Green Ext Time (p_c), s	0.0	11.4		0.0	0.0	6.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				21.7								
HCM 6th LOS				C								

Lanes, Volumes, Timings

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

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↑			↕	
Traffic Volume (vph)	152	1	0	0	152	222	0	152	14	44	0	105
Future Volume (vph)	152	1	0	0	152	222	0	152	14	44	0	105
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		30	0		0	100		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850		0.989				0.905
Flt Protected		0.953										0.985
Satd. Flow (prot)	0	1758	0	0	3505	1568	0	1842	0	0	1694	0
Flt Permitted		0.953										0.985
Satd. Flow (perm)	0	1758	0	0	3505	1568	0	1842	0	0	1694	0
Link Speed (mph)		25			25			35				35
Link Distance (ft)		225			302			180				1370
Travel Time (s)		6.1			8.2			3.5				26.7
Confl. Peds. (#/hr)	1							1				
Confl. Bikes (#/hr)								3				
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	167	1	0	0	167	244	0	167	15	48	0	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	168	0	0	167	244	0	182	0	0	163	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Stop			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.1%
ICU Level of Service	A
Analysis Period (min)	15

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

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑↑	↗		↑			↕	
Sign Control		Yield			Stop			Stop			Stop	
Traffic Volume (vph)	152	1	0	0	152	222	0	152	14	44	0	105
Future Volume (vph)	152	1	0	0	152	222	0	152	14	44	0	105
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)	167	1	0	0	167	244	0	167	15	48	0	115

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	168	84	84	244	182	163
Volume Left (vph)	167	0	0	0	0	48
Volume Right (vph)	0	0	0	244	15	115
Hadj (s)	0.25	0.05	0.05	-0.65	-0.02	-0.36
Departure Headway (s)	5.4	5.6	5.6	3.2	5.0	4.7
Degree Utilization, x	0.25	0.13	0.13	0.22	0.25	0.21
Capacity (veh/h)	623	595	596	1122	671	704
Control Delay (s)	10.2	8.3	8.3	5.9	9.7	9.0
Approach Delay (s)	10.2	6.9			9.7	9.0
Approach LOS	B	A			A	A

Intersection Summary	
Delay	8.4
Level of Service	A
Intersection Capacity Utilization	44.1% ICU Level of Service A
Analysis Period (min)	15

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	448	18	31	258	23	43	135	32	56	154	157
Future Volume (vph)	173	448	18	31	258	23	43	135	32	56	154	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	110		0	0		80	0		80
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00				0.95		0.99	
Frt		0.994			0.988				0.850			0.850
Flt Protected	0.950			0.950				0.988			0.987	
Satd. Flow (prot)	1736	1814	0	1736	1799	0	0	1859	1599	0	1821	1568
Flt Permitted	0.950			0.950				0.847			0.858	
Satd. Flow (perm)	1715	1814	0	1736	1799	0	0	1593	1513	0	1572	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			8				191			191
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		677			337			235			394	
Travel Time (s)		18.5			9.2			6.4			10.7	
Confl. Peds. (#/hr)	11					11			20	20		
Confl. Bikes (#/hr)			1						1			
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	192	498	20	34	287	26	48	150	36	62	171	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	192	518	0	34	313	0	0	198	36	0	233	174
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
6: SE 32nd Avenue & SE Harrison Street

09/20/2019

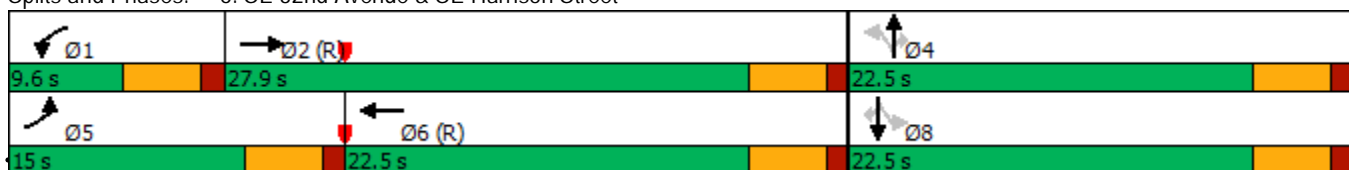


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4		8		8
Permitted Phases							4		4	8		8
Detector Phase	5	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	15.0	27.9		9.6	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	25.0%	46.5%		16.0%	37.5%		37.5%	37.5%	37.5%	37.5%	37.5%	37.5%
Maximum Green (s)	10.5	23.4		5.1	18.0		18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	10.4	33.2		5.8	22.4			13.8	13.8		13.8	13.8
Actuated g/C Ratio	0.17	0.55		0.10	0.37			0.23	0.23		0.23	0.23
v/c Ratio	0.64	0.52		0.20	0.46			0.54	0.07		0.65	0.34
Control Delay	34.3	13.9		28.2	18.4			25.2	0.3		28.9	4.6
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	34.3	13.9		28.2	18.4			25.2	0.3		28.9	4.6
LOS	C	B		C	B			C	A		C	A
Approach Delay		19.4			19.4			21.4			18.5	
Approach LOS		B			B			C			B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 19.5
 Intersection LOS: B
 Intersection Capacity Utilization 67.2%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 6: SE 32nd Avenue & SE Harrison Street



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DS

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

09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↖	↗
Traffic Volume (vph)	173	448	18	31	258	23	43	135	32	56	154	157
Future Volume (vph)	173	448	18	31	258	23	43	135	32	56	154	157
Ideal Flow (vphp)	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	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	1798			1859	1512		1809	1568
Flt Permitted	0.95	1.00		0.95	1.00			0.85	1.00		0.86	1.00
Satd. Flow (perm)	1736	1815		1736	1798			1594	1512		1572	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)	192	498	20	34	287	26	48	150	36	62	171	174
RTOR Reduction (vph)	0	2	0	0	5	0	0	0	28	0	0	134
Lane Group Flow (vph)	192	516	0	34	308	0	0	198	8	0	233	40
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)	10.4	30.4		2.3	22.3			13.8	13.8		13.8	13.8
Effective Green, g (s)	10.4	30.4		2.3	22.3			13.8	13.8		13.8	13.8
Actuated g/C Ratio	0.17	0.51		0.04	0.37			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)	300	919		66	668			366	347		361	360
v/s Ratio Prot	c0.11	c0.28		0.02	0.17							
v/s Ratio Perm								0.12	0.01		c0.15	0.03
v/c Ratio	0.64	0.56		0.52	0.46			0.54	0.02		0.65	0.11
Uniform Delay, d1	23.1	10.2		28.3	14.3			20.3	17.9		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	4.6	2.5		6.6	2.3			1.6	0.0		3.9	0.1
Delay (s)	27.7	12.7		34.9	16.6			21.9	17.9		24.8	18.4
Level of Service	C	B		C	B			C	B		C	B
Approach Delay (s)		16.7			18.4			21.3			22.1	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.63	B
Actuated Cycle Length (s)	60.0	Sum of lost time (s)
Intersection Capacity Utilization	67.2%	13.5
Analysis Period (min)	15	ICU Level of Service
		C
c Critical Lane Group		

HCM 6th Signalized Intersection Summary
6: SE 32nd Avenue & SE Harrison Street











09/20/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	448	18	31	258	23	43	135	32	56	154	157
Future Volume (veh/h)	173	448	18	31	258	23	43	135	32	56	154	157
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	0.99		0.95	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1885	1885	1885	1856	1856	1856
Adj Flow Rate, veh/h	192	498	20	34	287	26	48	150	36	62	171	174
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
Percent Heavy Veh, %	4	4	4	4	4	4	1	1	1	3	3	3
Cap, veh/h	238	770	31	63	563	51	75	180	453	76	160	456
Arrive On Green	0.14	0.44	0.44	0.04	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1753	1755	70	1753	1660	150	0	601	1512	0	534	1520
Grp Volume(v), veh/h	192	0	518	34	0	313	198	0	36	233	0	174
Grp Sat Flow(s),veh/h/ln	1753	0	1825	1753	0	1811	601	0	1512	534	0	1520
Q Serve(g_s), s	6.4	0.0	13.3	1.1	0.0	8.3	0.0	0.0	1.0	0.0	0.0	5.4
Cycle Q Clear(g_c), s	6.4	0.0	13.3	1.1	0.0	8.3	18.0	0.0	1.0	18.0	0.0	5.4
Prop In Lane	1.00		0.04	1.00		0.08	0.24		1.00	0.27		1.00
Lane Grp Cap(c), veh/h	238	0	801	63	0	614	255	0	453	236	0	456
V/C Ratio(X)	0.81	0.00	0.65	0.54	0.00	0.51	0.78	0.00	0.08	0.99	0.00	0.38
Avail Cap(c_a), veh/h	307	0	801	149	0	614	255	0	453	236	0	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.65	0.00	0.65	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.2	0.0	13.2	28.4	0.0	15.8	17.7	0.0	15.1	19.4	0.0	16.6
Incr Delay (d2), s/veh	7.8	0.0	2.6	6.9	0.0	3.0	14.1	0.0	0.1	54.8	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	5.4	0.6	0.0	3.7	3.0	0.0	0.3	6.0	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	0.0	15.8	35.4	0.0	18.8	31.7	0.0	15.1	74.2	0.0	17.1
LnGrp LOS	C	A	B	D	A	B	C	A	B	E	A	B
Approach Vol, veh/h		710			347			234			407	
Approach Delay, s/veh		20.5			20.5			29.2			49.8	
Approach LOS		C			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	30.8		22.5	12.6	24.9		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	23.4		18.0	10.5	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.1	15.3		20.0	8.4	10.3		20.0				
Green Ext Time (p_c), s	0.0	2.2		0.0	0.1	1.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				28.7								
HCM 6th LOS				C								

Lanes, Volumes, Timings
7: SE Oak Street & SE Monroe Street

09/20/2019

						
Lane Group	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (vph)	147	349	144	152	227	58
Future Volume (vph)	147	349	144	152	227	58
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.931			
Flt Protected	0.950					0.962
Satd. Flow (prot)	1787	1599	1734	0	0	1792
Flt Permitted	0.950					0.962
Satd. Flow (perm)	1787	1599	1734	0	0	1792
Link Speed (mph)	25		25			25
Link Distance (ft)	870		163			887
Travel Time (s)	23.7		4.4			24.2
Confl. Peds. (#/hr)	4	7		2	2	
Confl. Bikes (#/hr)		5		4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%
Adj. Flow (vph)	160	379	157	165	247	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	160	379	322	0	0	310
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	51.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: SE Oak Street & SE Monroe Street


















09/20/2019



Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	147	349	144	152	227	58
Future Volume (Veh/h)	147	349	144	152	227	58
Sign Control	Free		Stop		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	160	379	157	165	247	63
Pedestrians	2		4		7	
Lane Width (ft)	12.0		12.0		12.0	
Walking Speed (ft/s)	3.5		3.5		3.5	
Percent Blockage	0		0		1	
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)	870					
pX, platoon unblocked						
vC, conflicting volume	4		710	6	572	331
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4		710	6	572	331
tC, single (s)	4.1		6.5	6.2	7.1	6.5
tC, 2 stage (s)						
tF (s)	2.2		4.0	3.3	3.5	4.0
p0 queue free %	90		51	85	0	88
cM capacity (veh/h)	1618		320	1071	205	525
Direction, Lane #	NB 1	NB 2	SE 1	NW 1		
Volume Total	160	379	322	310		
Volume Left	160	0	0	247		
Volume Right	0	379	165	0		
cSH	1618	1700	499	234		
Volume to Capacity	0.10	0.22	0.65	1.32		
Queue Length 95th (ft)	8	0	113	413		
Control Delay (s)	7.5	0.0	24.4	213.8		
Lane LOS	A		C	F		
Approach Delay (s)	2.2		24.4	213.8		
Approach LOS			C	F		
Intersection Summary						
Average Delay			64.3			
Intersection Capacity Utilization			51.8%	ICU Level of Service	A	
Analysis Period (min)			15			


















Lanes, Volumes, Timings
8: SE 37th Avenue & SE Monroe Street

09/20/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	288	175	65	149	6	105	87	205	5	65	8
Future Volume (vph)	15	288	175	65	149	6	105	87	205	5	65	8
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.951			0.996			0.895			0.986	
Flt Protected		0.998			0.986		0.950				0.997	
Satd. Flow (prot)	0	1768	0	0	1829	0	1787	1684	0	0	1813	0
Flt Permitted		0.998			0.986		0.950				0.997	
Satd. Flow (perm)	0	1768	0	0	1829	0	1787	1684	0	0	1813	0
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		887			352			517			331	
Travel Time (s)		24.2			9.6			10.1			9.0	
Confl. Peds. (#/hr)	6		2	2		6			4	4		
Confl. Bikes (#/hr)			2			1			3			
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	17	320	194	72	166	7	117	97	228	6	72	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	531	0	0	245	0	117	325	0	0	87	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	65.7%						ICU Level of Service C					
Analysis Period (min)	15											

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

09/20/2019

												
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	175	65	149	6	105	87	205	5	65	8
Future Volume (vph)	15	288	175	65	149	6	105	87	205	5	65	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	194	72	166	7	117	97	228	6	72	9
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total (vph)	531	245	117	325	87							
Volume Left (vph)	17	72	117	0	6							
Volume Right (vph)	194	7	0	228	9							
Hadj (s)	-0.18	0.08	0.52	-0.47	0.00							
Departure Headway (s)	5.9	6.7	7.6	6.6	7.6							
Degree Utilization, x	0.87	0.46	0.25	0.60	0.18							
Capacity (veh/h)	598	505	448	510	430							
Control Delay (s)	36.0	15.3	11.9	17.7	12.2							
Approach Delay (s)	36.0	15.3	16.2		12.2							
Approach LOS	E	C	C		B							
Intersection Summary												
Delay			23.8									
Level of Service			C									
Intersection Capacity Utilization			65.7%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM 6th AWSC
8: SE 37th Avenue & SE Monroe Street

09/20/2019

Intersection	
Intersection Delay, s/veh	24.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵			↕	
Traffic Vol, veh/h	15	288	175	65	149	6	105	87	205	5	65	8
Future Vol, veh/h	15	288	175	65	149	6	105	87	205	5	65	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
Heavy Vehicles, %	2	2	2	2	2	2	1	1	1	3	3	3
Mvmt Flow	17	320	194	72	166	7	117	97	228	6	72	9
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	36.2	15.3	17.1	12.3
HCM LOS	E	C	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	3%	30%	6%
Vol Thru, %	0%	30%	60%	68%	83%
Vol Right, %	0%	70%	37%	3%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	292	478	220	78
LT Vol	105	0	15	65	5
Through Vol	0	87	288	149	65
RT Vol	0	205	175	6	8
Lane Flow Rate	117	324	531	244	87
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.246	0.594	0.871	0.456	0.181
Departure Headway (Hd)	7.602	6.586	5.901	6.709	7.517
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	473	548	616	535	475
Service Time	5.356	4.34	3.945	4.767	5.596
HCM Lane V/C Ratio	0.247	0.591	0.862	0.456	0.183
HCM Control Delay	12.8	18.6	36.2	15.3	12.3
HCM Lane LOS	B	C	E	C	B
HCM 95th-tile Q	1	3.9	10	2.4	0.7

Lanes, Volumes, Timings
 9: SE 37th Avenue & SE Washington Street

09/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	16	1	23	3	1	1	37	356	8	2	250	24
Future Volume (vph)	16	1	23	3	1	1	37	356	8	2	250	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.923			0.973			0.997			0.988	
Flt Protected		0.980			0.971			0.995				
Satd. Flow (prot)	0	1685	0	0	1795	0	0	1866	0	0	1840	0
Flt Permitted		0.980			0.971			0.995				
Satd. Flow (perm)	0	1685	0	0	1795	0	0	1866	0	0	1840	0
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		244			281			188			517	
Travel Time (s)		6.7			7.7			3.7			10.1	
Confl. Peds. (#/hr)	1		6	6		1			1	1		
Confl. Bikes (#/hr)												2
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
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	18	1	25	3	1	1	41	391	9	2	275	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	0	0	5	0	0	441	0	0	303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	51.1%						ICU Level of Service A					
Analysis Period (min)	15											

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

09/20/2019



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	356	8	2	250	24
Future Volume (Veh/h)	16	1	23	3	1	1	37	356	8	2	250	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	391	9	2	275	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	772	775	294	802	784	398	301			401		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	772	775	294	802	784	398	301			401		
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)	307	317	741	284	316	655	1266			1157		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	44	5	441	303								
Volume Left	18	3	41	2								
Volume Right	25	1	9	26								
cSH	460	328	1266	1157								
Volume to Capacity	0.10	0.02	0.03	0.00								
Queue Length 95th (ft)	8	1	3	0								
Control Delay (s)	13.6	16.2	1.0	0.1								
Lane LOS	B	C	A	A								
Approach Delay (s)	13.6	16.2	1.0	0.1								
Approach LOS	B	C										
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			51.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM 6th TWSC
 9: SE 37th Avenue & SE Washington Street

09/20/2019

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	1	23	3	1	1	37	356	8	2	250	24
Future Vol, veh/h	16	1	23	3	1	1	37	356	8	2	250	24
Conflicting Peds, #/hr	1	0	6	6	0	1	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	2	2	2
Mvmt Flow	18	1	25	3	1	1	41	391	9	2	275	26

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	772	775	294	790	784	398	301	0	0	401	0	0
Stage 1	292	292	-	479	479	-	-	-	-	-	-	-
Stage 2	480	483	-	311	305	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.11	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.209	-	-	2.218	-	-
Pot Cap-1 Maneuver	317	329	745	310	327	656	1266	-	-	1158	-	-
Stage 1	716	671	-	571	558	-	-	-	-	-	-	-
Stage 2	567	553	-	704	666	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	305	314	741	287	312	655	1266	-	-	1157	-	-
Mov Cap-2 Maneuver	305	314	-	287	312	-	-	-	-	-	-	-
Stage 1	686	670	-	546	534	-	-	-	-	-	-	-
Stage 2	541	529	-	674	665	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.6		16.1		0.7		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1266	-	-	461	329	1157	-
HCM Lane V/C Ratio	0.032	-	-	0.095	0.017	0.002	-
HCM Control Delay (s)	7.9	0	-	13.6	16.1	8.1	0
HCM Lane LOS	A	A	-	B	C	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0	-

Lanes, Volumes, Timings
 10: SE 37th Avenue & SE Railroad Avenue

09/20/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	110	102	330	192	166	142
Future Volume (vph)	110	102	330	192	166	142
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	30		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.950			
Flt Protected	0.950					0.974
Satd. Flow (prot)	1787	1599	1787	0	0	1814
Flt Permitted	0.950					0.974
Satd. Flow (perm)	1787	1599	1787	0	0	1814
Link Speed (mph)	35		35			35
Link Distance (ft)	419		1370			188
Travel Time (s)	8.2		26.7			3.7
Confl. Peds. (#/hr)		2				
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%
Adj. Flow (vph)	125	116	375	218	189	161
Shared Lane Traffic (%)						
Lane Group Flow (vph)	125	116	593	0	0	350
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.3%
ICU Level of Service	B
Analysis Period (min)	15

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

09/20/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	110	102	330	192	166	142
Future Volume (Veh/h)	110	102	330	192	166	142
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)	125	116	375	218	189	161
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	1023	486			593	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1023	486			593	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	41	80			81	
cM capacity (veh/h)	212	582			983	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	241	593	350			
Volume Left	125	0	189			
Volume Right	116	218	0			
cSH	340	1700	983			
Volume to Capacity	0.71	0.35	0.19			
Queue Length 95th (ft)	129	0	18			
Control Delay (s)	37.7	0.0	6.1			
Lane LOS	E		A			
Approach Delay (s)	37.7	0.0	6.1			
Approach LOS	E					
Intersection Summary						
Average Delay			9.5			
Intersection Capacity Utilization			62.3%		ICU Level of Service	B
Analysis Period (min)	15					

HCM 6th TWSC
10: SE 37th Avenue & SE Railroad Avenue

09/20/2019

Intersection						
Int Delay, s/veh	7.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	110	102	330	192	166	142
Future Vol, veh/h	110	102	330	192	166	142
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	30	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	125	116	375	218	189	161

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1023	486	0	0	593	0
Stage 1	484	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.12	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.218	-
Pot Cap-1 Maneuver	262	583	-	-	983	-
Stage 1	622	-	-	-	-	-
Stage 2	587	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	207	582	-	-	983	-
Mov Cap-2 Maneuver	207	-	-	-	-	-
Stage 1	622	-	-	-	-	-
Stage 2	463	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	29.9	0	5.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	207	582	983	-
HCM Lane V/C Ratio	-	-	0.604	0.199	0.192	-
HCM Control Delay (s)	-	-	45.8	12.7	9.5	0
HCM Lane LOS	-	-	E	B	A	A
HCM 95th %tile Q(veh)	-	-	3.4	0.7	0.7	-

SE OAK ST AT SE MONROE ST/SE RAILROAD AVE

Westbound Stop-Controlled Lane (Railroad Ave)

Sept. 3rd 2019

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16:55 - 17:00	12
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17:00 - 17:05	12
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17:05 - 17:10	18
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17:10 - 17:15	31
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17:15 - 17:20	21
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17:20 - 17:25	30
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	:00	:10	:20	:30	:40	:50
16:55	0	0	2	2	2	1
16:56	0	0	0	0	0	0
16:57	0	1	1	0	0	0
16:58	0	0	0	0	0	0
16:59	0	0	0	1	1	1
17:00	2	3	3	3	3	3
17:01	3	3	3	2	2	3
17:02	3	3	1	0	0	1
17:03	1	1	0	2	0	0
17:04	0	0	0	0	0	0
17:05	1	1	4	3	1	1
17:06	0	0	0	0	0	0
17:07	0	1	1	2	2	1
17:08	0	0	0	0	0	0
17:09	0	1	0	0	0	0
17:10	0	0	1	2	3	1
17:11	1	0	0	0	0	0
17:12	0	2	0	2	0	0
17:13	0	1	0	0	1	1
17:14	0	2	2	1	1	1
17:15	0	0	0	2	0	0
17:16	0	0	0	2	0	0
17:17	0	0	0	0	0	0
17:18	0	1	1	0	0	1
17:19	0	0	0	0	0	0
17:20	1	1	3	2	1	1
17:21	0	0	1	0	1	0
17:22	2	1	0	0	0	0
17:23	1	0	1	0	0	0
17:24	1	0	0	0	0	0

SE OAK ST AT SE MONROE ST/SE RAILROAD AVE

Westbound Stop-Controlled Lane (Railroad Ave)

Sept. 3rd 2019

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17:25 - 17:30	18
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17:30 - 17:35	20
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17:35 - 17:40	22
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17:40 - 17:45	23
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17:45 - 17:50	28
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17:50 - 17:55	16
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	:00	:10	:20	:30	:40	:50
17:25	1	0	0	0	0	0
17:26	0	1	0	1	2	3
17:27	3	1	1	1	0	0
17:28	0	0	1	0	0	0
17:29	0	0	0	0	0	0
17:30	1	1	0	0	0	2
17:31	1	0	0	0	0	0
17:32	1	0	0	0	0	0
17:33	0	0	1	1	0	0
17:34	0	0	1	0	0	0
17:35	0	1	0	1	2	1
17:36	0	0	0	0	0	0
17:37	0	1	1	1	0	0
17:38	0	0	1	0	1	0
17:39	0	0	0	0	0	0
17:40	0	0	0	0	0	0
17:41	0	1	0	0	0	0
17:42	0	0	0	0	1	0
17:43	0	0	0	0	1	0
17:44	1	0	0	1	0	1
17:45	0	0	0	0	0	0
17:46	0	1	0	0	0	0
17:47	2	3	2	1	0	0
17:48	0	1	0	0	0	1
17:49	1	4	4	5	4	2
17:50	0	0	0	1	2	3
17:51	2	1	0	0	0	1
17:52	0	0	1	0	1	3
17:53	2	1	0	0	0	0
17:54	1	0	0	0	0	0

Queued Vehicles	212 s
Total Vehicles	251 veh
Interval length	10 s

Stopped Delay per Vehicle	8.4 s/veh
Total Control Delay per Vehicle	13.4 s/veh

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

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

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)	2.1	0.2	0.5	0.9
Total Delay (hr)	0.0	0.3	1.3	1.6
Total Del/Veh (s)	0.5	6.9	11.1	7.1
Stop Delay (hr)	0.0	0.3	1.0	1.3
Stop Del/Veh (s)	0.0	6.0	8.7	5.6
Total Stops	3	170	408	581
Stop/Veh	0.01	0.99	0.99	0.71
Vehicles Entered	238	171	410	819
Vehicles Exited	239	171	410	820
Hourly Exit Rate	239	171	410	820
Input Volume	235	174	414	823
% of Volume	102	98	99	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)	1.8
Total Del/Veh (s)	7.9
Stop Delay (hr)	1.4
Stop Del/Veh (s)	6.0
Total Stops	581
Stop/Veh	0.71
Vehicles Entered	819
Vehicles Exited	820
Hourly Exit Rate	820
Input Volume	1646
% of Volume	50
Denied Entry Before	0
Denied Entry After	0

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	3.9	0.3	1.9
Total Delay (hr)	0.2	1.5	0.9	2.6
Total Del/Veh (s)	1.3	18.3	11.9	8.8
Stop Delay (hr)	0.0	1.5	0.7	2.2
Stop Del/Veh (s)	0.1	18.3	9.7	7.7
Total Stops	16	235	268	519
Stop/Veh	0.03	0.79	1.00	0.49
Vehicles Entered	483	293	269	1045
Vehicles Exited	482	295	267	1044
Hourly Exit Rate	482	295	267	1044
Input Volume	493	278	271	1042
% of Volume	98	106	99	100
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)	1.9
Total Delay (hr)	2.8
Total Del/Veh (s)	9.6
Stop Delay (hr)	2.3
Stop Del/Veh (s)	8.0
Total Stops	519
Stop/Veh	0.49
Vehicles Entered	1045
Vehicles Exited	1045
Hourly Exit Rate	1045
Input Volume	2084
% of Volume	50
Denied Entry Before	0
Denied Entry After	0

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

Approach	NB	SE	NW	All
Denied Delay (hr)	0.2	0.0	0.1	0.2
Denied Del/Veh (s)	2.3	0.2	0.5	1.0
Total Delay (hr)	0.0	0.4	1.8	2.2
Total Del/Veh (s)	0.5	7.8	14.4	9.3
Stop Delay (hr)	0.0	0.3	1.5	1.8
Stop Del/Veh (s)	0.0	7.0	12.2	7.8
Total Stops	3	171	436	610
Stop/Veh	0.01	0.98	0.98	0.72
Vehicles Entered	234	173	442	849
Vehicles Exited	234	174	441	849
Hourly Exit Rate	234	174	441	849
Input Volume	236	180	434	850
% of Volume	99	97	102	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)	1.0
Total Delay (hr)	2.4
Total Del/Veh (s)	10.1
Stop Delay (hr)	1.9
Stop Del/Veh (s)	8.2
Total Stops	610
Stop/Veh	0.71
Vehicles Entered	849
Vehicles Exited	850
Hourly Exit Rate	850
Input Volume	1700
% of Volume	50
Denied Entry Before	0
Denied Entry After	0

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	3.6	0.3	1.8
Total Delay (hr)	0.2	1.6	0.9	2.6
Total Del/Veh (s)	1.3	19.9	11.4	8.9
Stop Delay (hr)	0.0	1.6	0.7	2.3
Stop Del/Veh (s)	0.0	20.0	9.1	7.8
Total Stops	17	223	281	521
Stop/Veh	0.03	0.78	0.99	0.49
Vehicles Entered	496	286	280	1062
Vehicles Exited	496	286	282	1064
Hourly Exit Rate	496	286	282	1064
Input Volume	496	296	284	1077
% of Volume	100	96	99	99
Denied Entry Before	1	0	0	1
Denied Entry After	0	0	0	0

Total Network Performance

Denied Delay (hr)	0.5
Denied Del/Veh (s)	1.8
Total Delay (hr)	2.9
Total Del/Veh (s)	9.7
Stop Delay (hr)	2.4
Stop Del/Veh (s)	8.1
Total Stops	521
Stop/Veh	0.49
Vehicles Entered	1062
Vehicles Exited	1065
Hourly Exit Rate	1065
Input Volume	2154
% of Volume	49
Denied Entry Before	1
Denied Entry After	0