

# Knutson Industrial

Pierce County, WA

Revised Transportation Impact Study

July 18, 2016

Prepared for:

*Michelson Commercial Realty and Development, LLC  
7701 Forsyth Boulevard, Suite 900  
St. Louis, MO 63105*

Prepared by:



Transportation Engineering NorthWest

11400 SE 8<sup>th</sup> Street, Suite 200

Bellevue, WA 98004

Office: (425) 889-6747

Fax: (425) 889-8369

# Table of Contents

<b>FINDINGS/CONCLUSIONS</b> .....	1
<b>INTRODUCTION</b> .....	3
Project Description .....	3
Project Approach.....	3
Primary Data and Information Sources .....	3
<b>EXISTING CONDITIONS</b> .....	6
Roadway Network .....	6
Transit Service.....	6
Non-motorized Transportation Facilities .....	6
Existing Peak-Hour Traffic Volumes .....	6
Level of Service .....	10
<b>TRAFFIC IMPACT ANALYSIS</b> .....	12
Project Trip Generation .....	12
Project Trip Distribution and Assignment .....	12
Future Traffic Volumes .....	17
Future PM Peak Hour Level of Service .....	17
AM Peak Hour LOS Analysis.....	23
Site Access Evaluation .....	24
<i>Site Access LOS</i> .....	24
<i>Signal Warrants</i> .....	24
<i>Left-Turn Lane Analysis</i> .....	25
<i>Street Improvements</i> .....	25
<b>PROJECT MITIGATION MEASURES</b> .....	27
Traffic Impact Fee .....	27
Off-Site LOS Impact .....	27
Site Access.....	27
Street Improvements .....	27

## Appendices

- Appendix A – Traffic Count Data
- Appendix B – LOS Results Worksheets
- Appendix C – Trip Generation Calculations
- Appendix D – Signal Warrant Analysis
- Appendix E – Left-Turn Lane Analysis
- Appendix F – Roadway Cross-Sections

## List of Figures and Tables

Figure 1	Project Site Vicinity .....	4
Figure 2	Preliminary Site Plan .....	5
Figure 3	Study Intersections .....	7
Figure 4	Existing PM Peak Hour Traffic Volumes .....	8
Figure 5	Existing AM Peak Hour Traffic Volumes.....	9
Figure 6	PM Peak Hour Project Trip Assignment .....	13
Figure 7	AM Peak Hour Project Trip Assignment.....	14
Figure 8	2021 Without-Project PM Peak Hour Traffic Volumes .....	16
Figure 9	2021 Without-Project AM Peak Hour Traffic Volumes.....	17
Figure 10	2021 With-Project PM Peak Hour Traffic Volumes .....	18
Figure 11	2021 With-Project AM Peak Hour Traffic Volumes .....	19
Table 1	LOS Criteria for Signalized and Unsignalized Intersections <sup>1</sup> .....	10
Table 2	Existing Peak Hour LOS Summary.....	11
Table 3	Knutson – Trip Generation Summary .....	12
Table 4	Future 2021 PM Peak Hour LOS Summary .....	21
Table 5	Future 2021 AM Peak Hour LOS Summary.....	22
Table 6	Signal Warrant Analysis Results at Shaw Road/5 <sup>th</sup> Ave SE .....	24

## FINDINGS/CONCLUSIONS

This Revised Transportation Impact Study has been revised from the February 2, 2016 report to incorporate and address comments provided by Pierce County. No comments were identified by WSDOT, City of Puyallup, or City of Sumner. The following summarizes the Findings and Conclusions of the revised analysis.

**Project Proposal.** The project proposal remains the same as that which was evaluated in the Feb. 2, 2016 traffic analysis, which includes a multi-use industrial site with up to 3,012,000 square foot (sf) of new buildings that will include a combination of warehouse distribution center, general warehouse, and manufacturing land uses. Full project buildout is expected by 2021.

**Vehicle Access.** Primary vehicular routing to and from the site is anticipated via 5<sup>th</sup> Ave SE as a new east-west roadway between Shaw Road E and 134<sup>th</sup> Ave E. Secondary routing is expected at 134<sup>th</sup> Ave E (called 33<sup>rd</sup> Street SE by City of Puyallup) via E Pioneer.

**Trip Generation.** The proposed project at buildout is anticipated to generate 6,723 net new trips per weekday, with 742 net new trips occurring during the weekday AM peak hour and 701 net new trips in the weekday PM peak hour.

**Intersection LOS.** Weekday PM peak hour LOS analyses were conducted at 20 off-site signalized intersections and two site access intersection at 33<sup>rd</sup> Street SE/E Pioneer and Shaw Road. Weekday AM peak hour LOS analyses were conducted at the site access locations and the SR-410 interchange ramps with Main Ave/Traffic Ave. The LOS analyses for this Revised Transportation Impact Study was not modified from the analysis and results identified in the February 2, 2016 report.

The results of the LOS analyses indicated that most of the study intersections are anticipated to operate at LOS E or better without or with the project during the PM peak hour. The SR-410 interchange ramps with Traffic Ave/Main Ave are currently operating over capacity during peak hours. The added traffic from the proposed Knutson project is not expected to create a significant adverse impact at the off-site study intersections.

**Site Access Evaluation.** Two access locations were evaluated. Primary access would occur via the new 5<sup>th</sup> Avenue SE road connection between Shaw Road and 134<sup>th</sup> Ave E, which is being constructed by the Schnitzer Industrial Development of the Van Lierop project. Secondary access would use 134<sup>th</sup> Ave E (33<sup>rd</sup> Street SE) with connection to E Pioneer. It is anticipated that a traffic signal would be warranted at the 5<sup>th</sup> Ave SE intersection with Shaw Road with approximately 1.3M sf of building area with the Knutson development.

**Street Improvements.** The northern half street portion of 5<sup>th</sup> Avenue SE is anticipated to be constructed by the Schnitzer Industrial Development of the Van Lierop project between Shaw Road and 134<sup>th</sup> Ave E (33<sup>rd</sup> Street SE), and the east half of 134<sup>th</sup> Ave E on the east property edge of the Van Lierop project as Commercial Collector roads. The Knutson development would construct the remaining portions of 134<sup>th</sup> Ave E north of 5<sup>th</sup> Ave SE and south to 74<sup>th</sup> Street E consistent with Pierce County roadway standard PC.A1.1 which would include 32 feet pavement width (two 12-foot lanes with 4-foot shoulders), new curb/gutter, and 6-foot sidewalks. 134<sup>th</sup> Ave E south of 74<sup>th</sup> to 80<sup>th</sup> Street E is proposed to be upgraded to provide 32-feet of pavement width (two 12-foot lanes

with 4-foot shoulders) and 4-foot storm ditches on both sides within the 40-foot right-of-way. This pavement road section would be consistent with PC.A1.1 and is expected to be developed to its full standard as those properties develop. 80<sup>th</sup> Street E will be improved on the northern portion of the Knutson frontage to include 6-foot sidewalk, curb/gutter, 4-foot shoulder and 12-foot travel lane on north side, along with 5-foot ROW dedication.

**Project Mitigation.** The following measures are proposed to mitigate transportation impacts of the proposed Knutson industrial development.

- County Traffic Impact Fees. To mitigate long-term transportation impacts, the County administers a Traffic Impact Fee (TIF) to new developments to improve the transportation system to accommodate the higher travel demand added by new development. The current traffic impact fee rate for a manufacturing use in zone 5 is \$0.79 per sf of building area; and that rate is further reduced by 90 percent for a manufacturing use located in an Employment Center. The current traffic impact fee rate for a warehouse use in zone 5 is \$1.03 per sf of building area.

The high-cube warehouse-distribution center does not have a specific category identified in the County's Ordinance. As a result, an independent traffic impact fee calculation is proposed consistent with County Ordinance allowances. The daily trip rate of 1.68 was used for LUC 152 (high-cube distribution center) from the *ITE Trip Generation manual* (9<sup>th</sup> edition). The calculation also uses the 90 percent new trip rate, the 1.37 trip length adjustment factor, and the \$167.84 cost per trip (zone 5). All of these are standard factors applied to the ITE trip rate for LUC 152. The resulting independent traffic impact fee for high-cube warehouse-distribution center would be \$0.35 per sf of building area.

- Off-Site LOS Impacts. To mitigate project impacts to the study intersections based on future 2021 PM peak hour LOS evaluation with the project, payment of a proportionate-share cost would be made toward future improvements at the SR-410/Main Ave/Traffic Ave interchange.
- Site Access. To mitigate project impacts to site access, a traffic signal would be constructed at the Shaw Road/5<sup>th</sup> Ave SE intersection with approximately 1.3M square feet of building area for the Knutson development.
- Street Improvements. The Knutson development would be required to construct street improvements to buildout 5<sup>th</sup> Avenue SE to a full Collector Arterial between Shaw Road and 134<sup>th</sup> Ave E (33<sup>rd</sup> Street SE) with the first phase of development. The Knutson development would construct the remaining portions of 134<sup>th</sup> Ave E north of 5<sup>th</sup> Ave SE and south to 74<sup>th</sup> Street E consistent with Pierce County roadway standard PC.A1.1 which would include 32 feet pavement width (two 12-foot lanes with 4-foot shoulders), new curb/gutter, and 6-foot sidewalks. 134<sup>th</sup> Ave E south of 74<sup>th</sup> to 80<sup>th</sup> Street E would be upgraded to provide 32-feet of pavement width (two 12-foot lanes with 4-foot shoulders) and 4-foot storm ditches on both sides within the 40-foot right-of-way. 80<sup>th</sup> Street E will be improved on the northern portion of the Knutson frontage to include 6-foot sidewalk, curb/gutter, 4-foot shoulder and 12-foot travel lane on north side, along with 5-foot ROW dedication.

## INTRODUCTION

This Revised Transportation Impact Study documents the traffic impacts associated with the proposed Knutson industrial development located south of SR 410 and the Puyallup River, east of Shaw Road in Pierce County. A vicinity map of the project location is shown in **Figure 1**. The scope of work was confirmed in coordination with Pierce County, WSDOT, City of Puyallup, and City of Sumner.

This report has been revised from the February 2, 2016 Study to incorporate and address comments provided by Pierce County.

## Project Description

The proposed project includes up to 3,012,000 square feet of new buildings that will include a combination of high-cube warehouse distribution center, general warehouse, and manufacturing land uses. The existing site includes four single-family homes that would be removed and the site is expected to be occupied by year 2021.

Vehicular access to the site would be provided via 134th Ave E (called 33<sup>rd</sup> Street SE by City of Puyallup) and a new east-west roadway between Shaw Road E and 134th Ave E (called 5<sup>th</sup> Street SE by City of Puyallup). A preliminary site plan is included in **Figure 2**.

## Project Approach

Based on scoping confirmation with Pierce County, WSDOT, City of Puyallup and City of Sumner, the following tasks were undertaken to evaluate and disclose the traffic impacts associated with the Knutson Industrial development:

- Assessed existing conditions through field reconnaissance and reviewed existing planning documents;
- Described and assessed existing transportation conditions in the study area;
- Documented existing public transit service and non-motorized facilities;
- Estimated trip generation for weekday daily, AM and PM peak hour conditions;
- Documented trip distribution and assignment of project-generated traffic;
- Documented traffic forecasts and assumptions for year 2021 PM peak hour conditions with and without the proposed development;

## Primary Data and Information Sources

- Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9<sup>th</sup> Edition, 2012.
- 2015 & 2016 PM Peak Hour traffic counts by All Traffic Data.
- *Highway Capacity Manual (HCM)*, TRB, 2010.
- Pierce Transit Website, January 2016.
- City of Puyallup, City of Sumner, and WSDOT Signal Timing Data.

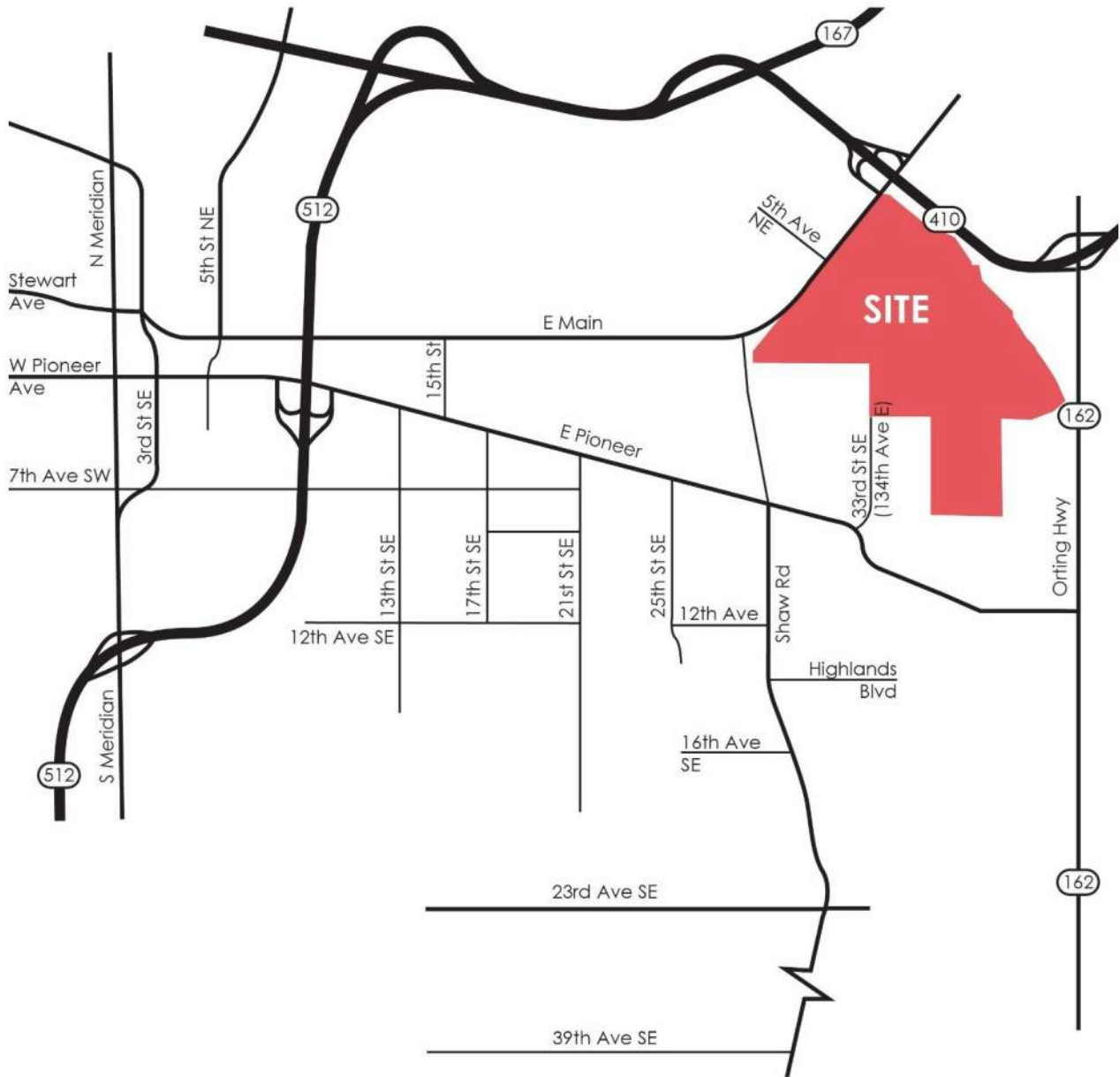


Figure 1: Project Site Vicinity



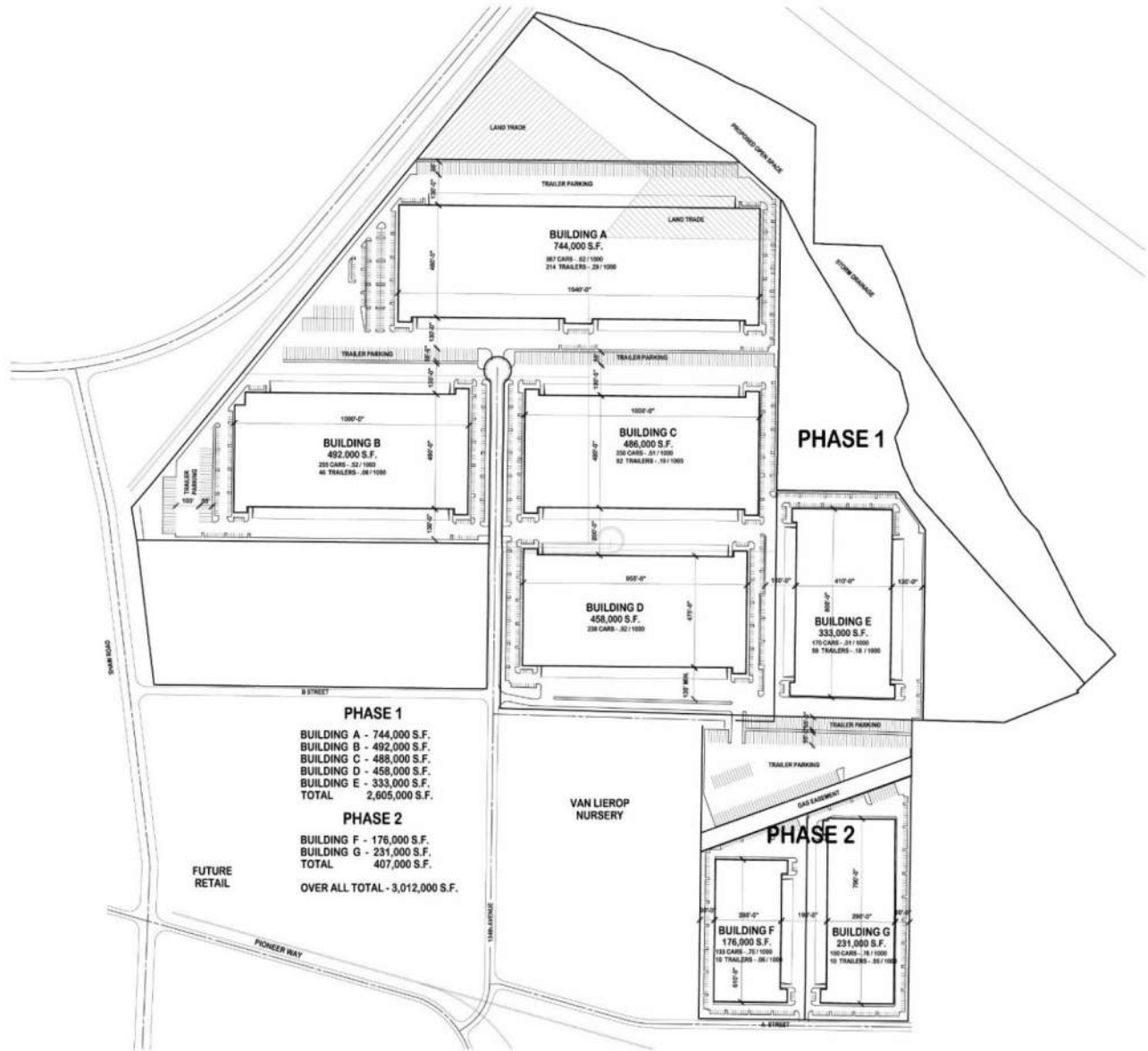


Figure 2: Preliminary Site Plan





## EXISTING CONDITIONS

### Roadway Network

The primary vehicle travel routes to and from the site include Shaw Road, E Pioneer, and 134th Ave E. These roadways serving the project site are described below:

**Shaw Road** is a two-way north-southbound Arterial street in the project vicinity. It is a 5-lane road with curb, gutter, and sidewalks on both sides and a posted speed limit of 35 mph.

**E Pioneer** is a two-way east-west Arterial in the site vicinity. West of Shaw Road, it has 4 travel lanes, curb/gutter/sidewalk on the south side and a posted speed limit of 35 mph. East of Shaw Road, E Pioneer has two travel lanes with turn lanes at some intersections, a posted speed of 35 mph, and no sidewalks or paved shoulders.

**134th Ave E** is a narrow two-way northbound-southbound undeveloped road that serves local access to parcels north of E Pioneer.

### Transit Service

Transit service to and from the project vicinity is provided by Pierce Transit. There are no bus routes or stops adjacent to the site or in the immediate vicinity. The nearest transit stop is located on E Main at the Shaw Road intersection approximately a quarter mile north of the site. This bus stop serves bus route 409 between Parkland and Puyallup.

### Non-motorized Transportation Facilities

Non-motorized transportation facilities in the project vicinity include sidewalks on Shaw Road and the south side of E Pioneer west of Shaw Road. Crosswalks with pedestrian push buttons are provided at the signalized intersections of Shaw Road/E Pioneer and Shaw Road /E Main.

### Existing Peak-Hour Traffic Volumes

Year 2015 and 2016 existing traffic volumes were collected at 20 study intersections and 2 site access locations for PM peak hour conditions, and counts at 2 of those intersections and the 2 site access locations were collected for AM peak hour conditions. Traffic count data is included in **Attachment A**.

**Figure 4** illustrates the PM peak hour traffic volumes at the study intersections. AM peak hour traffic volumes are illustrated in **Figure 5**.



Figure 3: Study Intersections

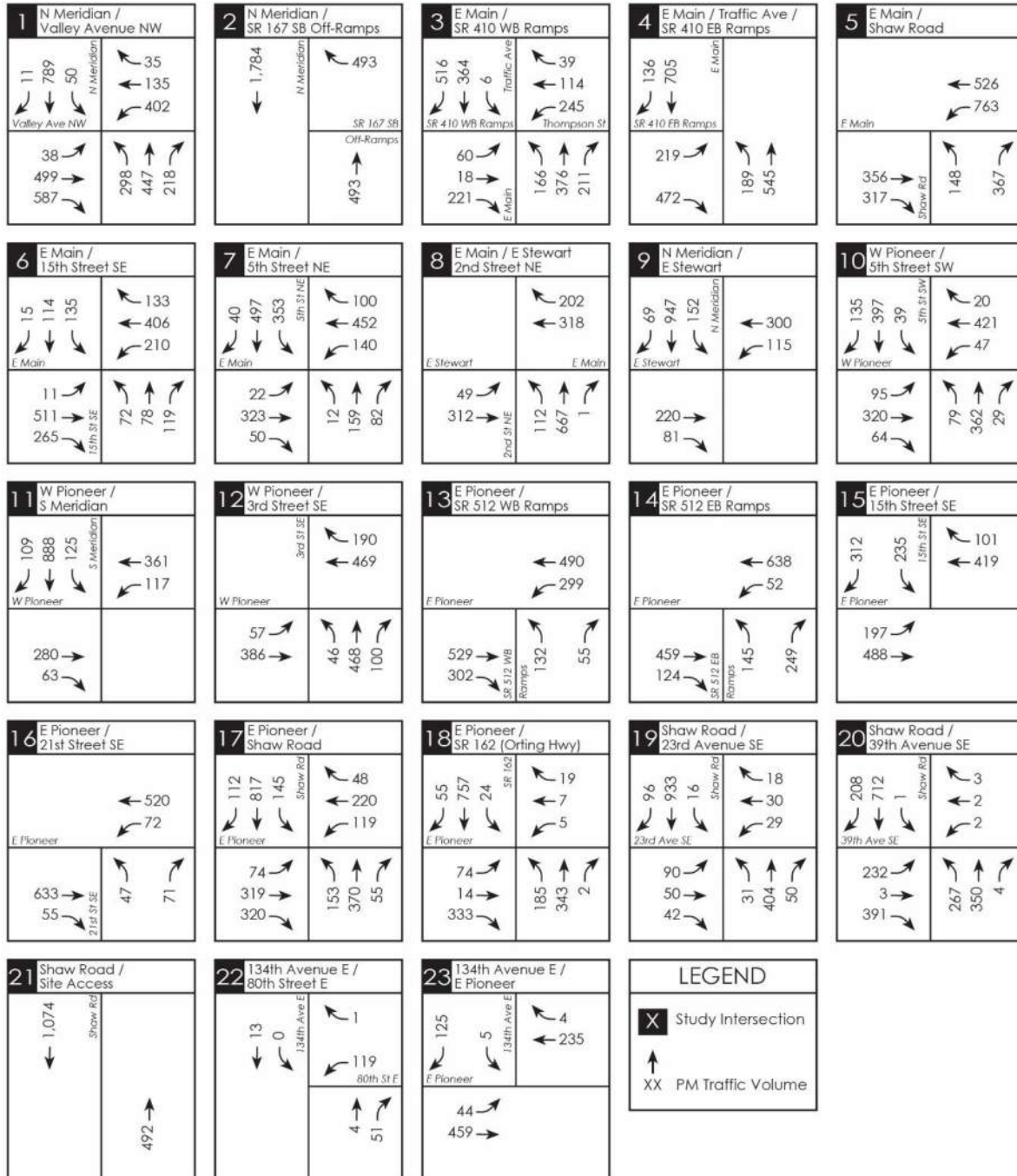


Figure 4: 2016 Existing PM Peak Hour Traffic Volumes

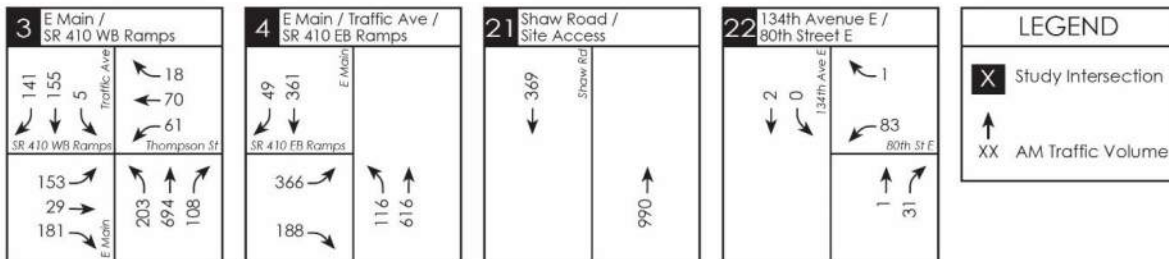


Figure 5: 2016 Existing AM Peak Hour Traffic Volumes



## Level of Service

Based on scoping discussions with all agencies, weekday PM peak hour level of service (LOS) analyses were conducted at 20 study intersections and 2 site access locations, and AM peak hour LOS at 2 study intersections and the 2 site access locations.

LOS generally refers to the degree of congestion on a roadway or intersection. It is a measure of vehicle operating speed, travel time, travel delays, and driving comfort. A letter scale from A to F generally describes intersection LOS. At signalized intersections, LOS A represents free-flow conditions (motorists experience little or no delays), and LOS F represents forced-flow conditions where motorists experience an average delay in excess of 80 seconds per vehicle.

The LOS reported for signalized intersections, roundabouts, and all-way stop controlled intersections represents the average control delay (sec/veh) and can be reported for the overall intersection, for each approach, and for each lane group or movement (additional v/c ratio criteria apply to lane group or movement LOS only). The LOS reported at two-way stop-controlled intersections is based on the average control delay and can be reported for each controlled minor approach, controlled minor lane group, and controlled major-street movement (additional v/c ratio criteria apply to lane group or movement LOS only). **Table 1** outlines the current HCM 2010 LOS criteria for signalized and unsignalized intersections based on these methodologies.

**Table 1**  
**LOS Criteria for Signalized and Unsignalized Intersections<sup>1</sup>**

SIGNALIZED INTERSECTIONS			UNSIGNALIZED INTERSECTIONS		
Control Delay (sec/veh)	LOS by Volume-to Capacity (V/C) Ratio <sup>2</sup>		Control Delay (sec/veh)	LOS by Volume-to Capacity (V/C) Ratio <sup>3</sup>	
	≤ 1.0	> 1.0		≤ 1.0	> 1.0
≤ 10	A	F	≤ 10	A	F
> 10 to ≤ 20	B	F	> 10 to ≤ 15	B	F
> 20 to ≤ 35	C	F	> 15 to ≤ 25	C	F
> 35 to ≤ 55	D	F	> 25 to ≤ 35	D	F
> 55 to ≤ 80	E	F	> 35 to ≤ 50	E	F
> 80	F	F	> 50	F	F

1 Source: HCM2010 Highway Capacity Manual, Transportation Research Board, 2010.

2 For approach-based and intersection-wide assessments at signals, LOS is defined solely by control delay.

3 For two-way stop controlled int., LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-5th Avenue SE approaches or for the intersection as a whole at two-way stop controlled intersections. For approach-based and intersection-wide assessments at all-way stop controlled intersections and roundabouts, LOS is solely defined by control delay.

LOS calculations for both signalized and unsignalized intersections were calculated using the methodology and procedures outlined in the 2010 *Highway Capacity Manual* (HCM), Transportation Research Board (TRB), using the *Synchro 8* software program. Existing signal timing was provided by Pierce County, WSDOT, and City of Puyallup. The existing peak hour LOS analysis results for the study intersections and site access locations are summarized in **Table 2**. The LOS worksheets are included in **Appendix B**.

**Table 2**  
**Existing Peak Hour LOS Summary**

Study Intersections	PM Peak Hour LOS		AM Peak Hour LOS	
	LOS	Delay	LOS	Delay
<u>Signalized:</u>				
1. N Meridian / Valley Ave NW	D	45.8	--	--
2. N Meridian / SR-167 Off-Ramps	A			
3. E Main / Traffic Ave / SR-410 WB Ramps <sup>1</sup>	--	--	--	--
4. E Main / Traffic Ave / SR-410 EB Ramps <sup>1</sup>	--	--	--	--
5. E Main / Shaw Road	B	15.7	--	--
6. E Main / 15 <sup>th</sup> Street SE	B	11.2	--	--
7. E Main / 5 <sup>th</sup> Street NE	C	25.7	--	--
8. E Main / 2 <sup>nd</sup> Street NE / E Stewart	B	10.5	--	--
9. N Meridian / E Stewart	B	16.9	--	--
10. W Pioneer / 5 <sup>th</sup> Street SW	C	26.7	--	--
11. W Pioneer / S Meridian	C	25.3	--	--
12. E Pioneer / 3 <sup>rd</sup> Street SE / W Pioneer	B	18.2	--	--
13. E Pioneer / SR-512 WB Ramps	B	16.2	--	--
14. E Pioneer / SR-512 EB Ramps	B	11.6	--	--
15. E Pioneer / 15 <sup>th</sup> Street SE	B	11.1	--	--
16. E Pioneer / 21 <sup>st</sup> Street SE	A	2.4	--	--
17. E Pioneer / Shaw Road	C	25.5	--	--
18. E Pioneer / SR-162 (Orting Hwy)	C	22.5	--	--
19. Shaw Road / 23 <sup>rd</sup> Street SE	C	24.3	--	--
20. Shaw Road / 112 <sup>th</sup> St E / 39 <sup>th</sup> Ave SE	C	25.3	--	--
<u>Site Access (unsignalized):</u>				
21. Shaw Road / 5 <sup>th</sup> Street SE				
WB Turns from stop sign	--	--	--	--
SB Left-Turns from Shaw Road	--	--	--	--
22. 33 <sup>rd</sup> St SE / Pioneer / 80 <sup>th</sup> Ave				
NB Turns from stop sign	A	8.7	A	8.5
SB Turns from stop sign	B	11.3	B	10.4
23. E Pioneer / 33 <sup>rd</sup> St SE				
EB Left-Turns from E Pioneer	A	7.9	A	8.1
SB Turns from stop sign	B	11.0	B	11.1

1. Intersections operating over capacity, LOS results not reported.

As shown in **Table 2**, most of the study intersections and movements at the stop-controlled intersections currently operate at LOS D or better during the PM peak hour. Both ramps at the SR-410 interchange at Traffic Ave/Main Ave are operating over capacity, and are being evaluated by City of Sumner for future improvements.

## TRAFFIC IMPACT ANALYSIS

### Project Trip Generation

The proposed Knutson industrial development includes up to 3,012,000 square feet of new building area in a combination of high-cube warehouse distribution center, general warehouse, and manufacturing land uses. It should be noted that the project remains the same as that which was evaluated in the Feb. 2, 2016 traffic analysis.

Trip generation for the proposed Knutson project was determined using trip generation rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9<sup>th</sup> Edition. Weekday daily, AM peak hour, and PM peak hour trip generation rates were used to determine the amount of vehicles the proposed site would generate based on a split of 75% high-cube warehouse distribution center, 12.5% general warehousing, and 12.5% manufacturing.

**Table 3** summarizes the new weekday trips the proposed Knutson development would generate during a typical weekday and during the weekday AM and PM peak hours. The detailed trip generation calculations are provided in **Appendix C**.

**Table 3**  
**Knutson – Trip Generation Summary**

Time Period	Net New Trips Generated		
	In	Out	Total
Weekday Daily	3,361	3,362	6,723
Weekday AM Peak Hour	556	186	742
Weekday PM Peak Hour	221	480	701

As shown in **Table 3**, the proposed Knutson project is anticipated to generate 6,723 net new trips per weekday, with 742 net new trips during the AM peak hour (556 in, 186 out) and 701 net new trips during the weekday PM peak hour (221 in, 480 out).

### Project Trip Distribution and Assignment

The distribution of the project-generated vehicle trips to/from the site and vicinity streets was estimated based on existing traffic counts and local traffic patterns in the vicinity of the site; the distribution patterns were confirmed by Pierce County, City of Sumner, and City of Puyallup as part of the traffic scoping process.

Two separate trip distributions were considered; one for trucks and the other for non-truck trips that include primary employees and a limited number of visitors. The estimated trip distribution patterns are shown graphically in **Figures 6 and 7**. **Figure 8** illustrates the anticipated PM peak hour project trip assignment. **Figure 9** illustrates the AM peak hour project trip assignment. It should be noted that site access west to Shaw Road via 5<sup>th</sup> Street SE and south to 80<sup>th</sup> Ave and E Pioneer were identified as the only access locations for the Knutson development.





Figure 6: Non-Truck Project Trip Distribution





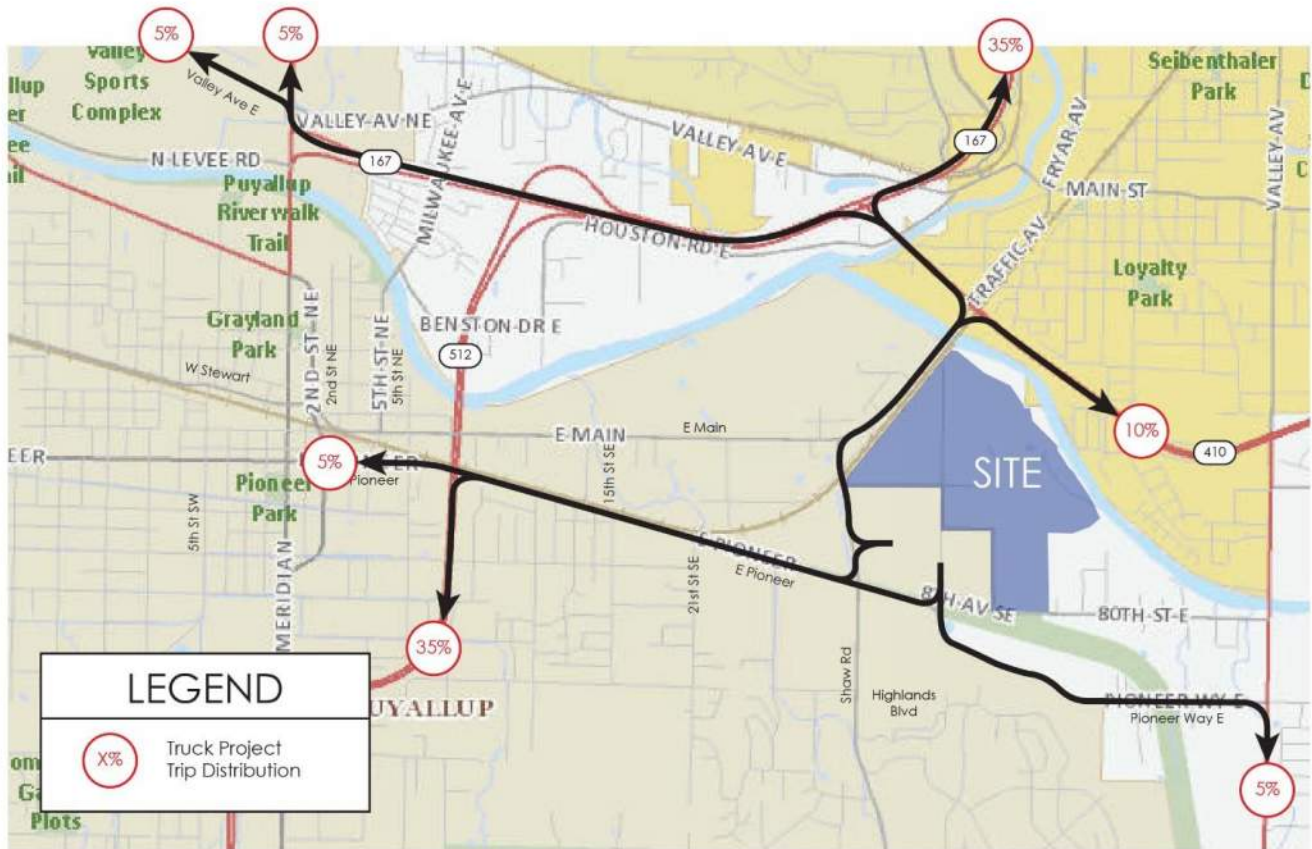


Figure 7: Truck Project Trip Distribution



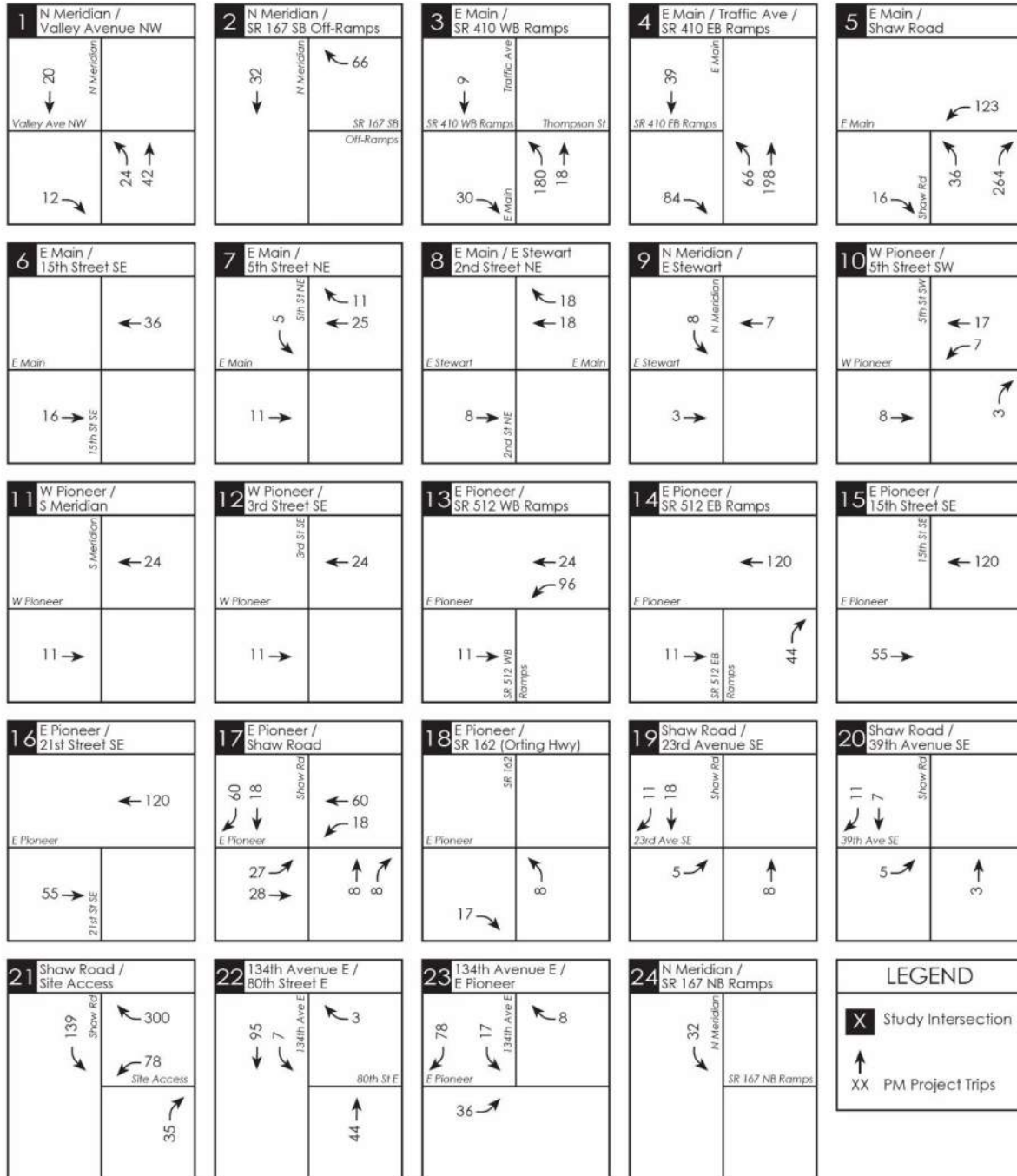


Figure 8: PM Peak Hour Project Trip Assignment

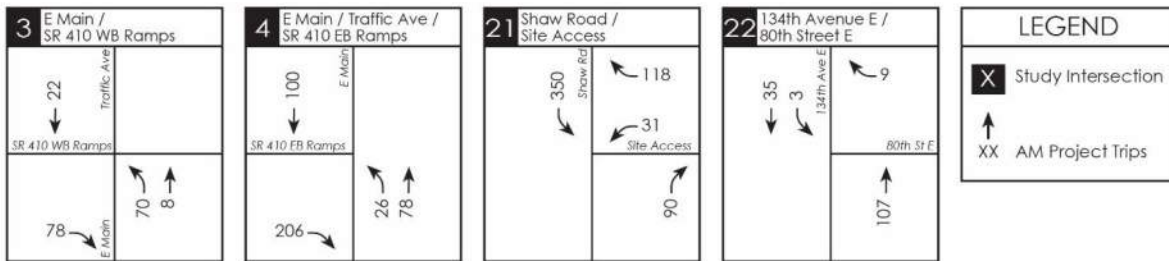


Figure 9: AM Peak Hour Project Trip Assignment



## Future Traffic Volumes

To estimate future year 2021 without-project traffic volumes at the study intersections, a 3 percent annual growth rate was applied to existing AM and PM peak hour volumes to account for new development in the study area and growth in existing traffic. In addition, traffic from the Schnitzer Industrial Development of the Van Lierop project was included. The future 2021 without-project PM peak hour traffic volumes at the study intersections and site accesses are shown in **Figure 10**. The future AM peak hour traffic volumes are shown in **Figure 11**.

Adding the truck and non-truck trip assignment from the proposed Knutson industrial development to the future 2021 without-project traffic volumes results in the 2021 with-project traffic volumes at the study intersection and site access locations. The future 2021 with-project PM peak hour traffic volumes at the study intersections and site access locations are shown in **Figure 12**. The future with-project AM peak hour traffic volumes are shown in **Figure 13**.

It should be noted that the project proposal remains the same as that which was evaluated in the Feb. 2, 2016 traffic analysis, and the trip assignment and future with and without-project traffic volumes figures remain the same with the exception that they have been re-numbered.

## Future PM Peak Hour Level of Service

Future PM peak hour LOS were evaluated at the 20 study intersections and 2 site access locations for the anticipated year of occupancy (2021). Future AM peak hour LOS are described in the next section. The future roadway network assumed in the 2021 LOS analysis was based on existing intersection geometry and signal timing for a majority of the study intersections with no planned improvements anticipated. There are a couple study intersections that have been identified improvements planned for construction by 2021; those are noted in the LOS table below. The 2021 weekday PM peak hour LOS results at the study intersection and site access locations are summarized in **Table 4**. The detailed LOS worksheets are included in **Appendix B**.

It should be noted that the project proposal remains the same as that which was evaluated in the Feb. 2, 2016 traffic analysis, and the LOS results remain the same as reported in the previous report.

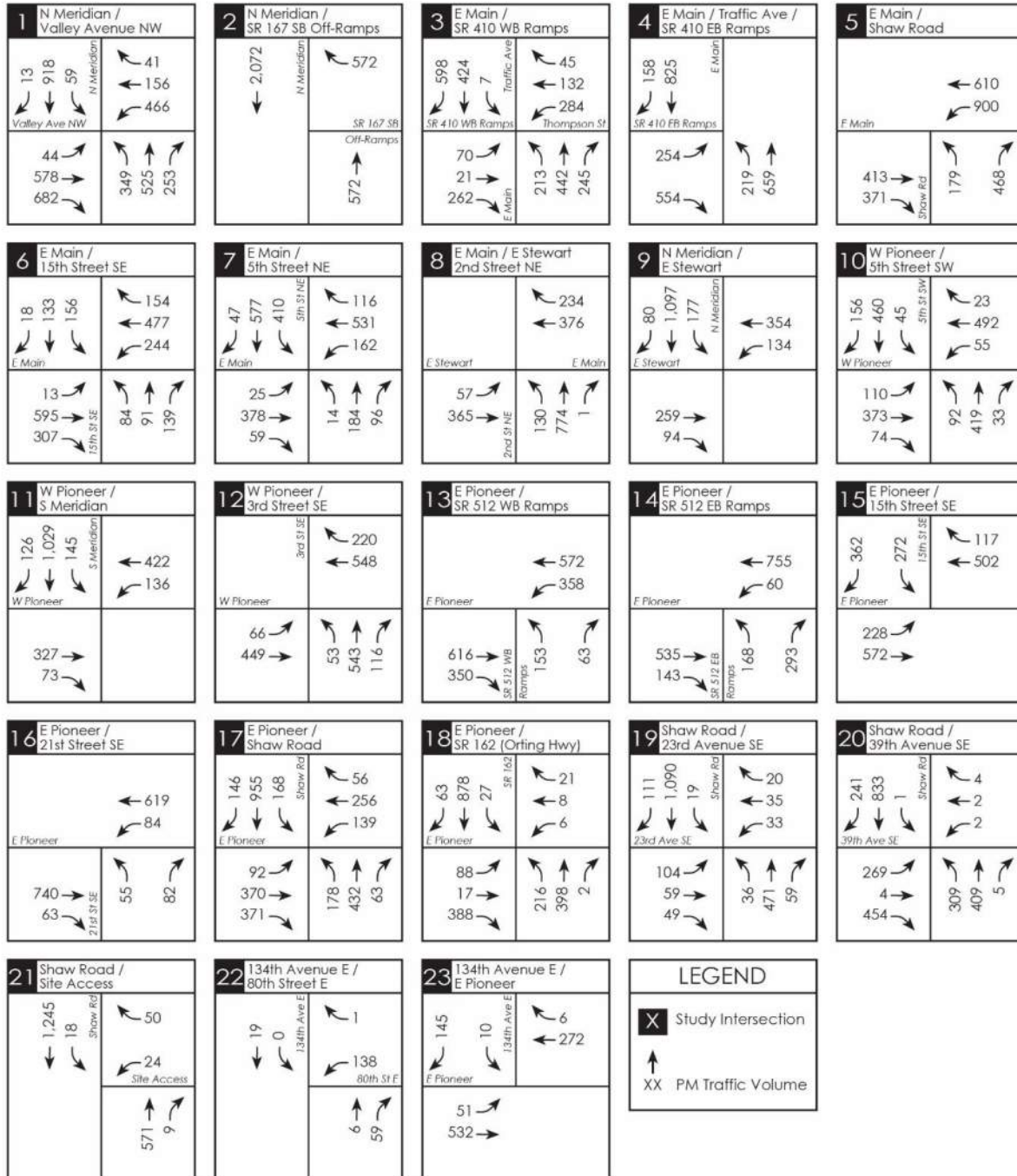


Figure 10: 2021 Baseline PM Peak Hour Traffic Volumes





Figure 11: 2021 Baseline AM Peak Hour Traffic Volumes



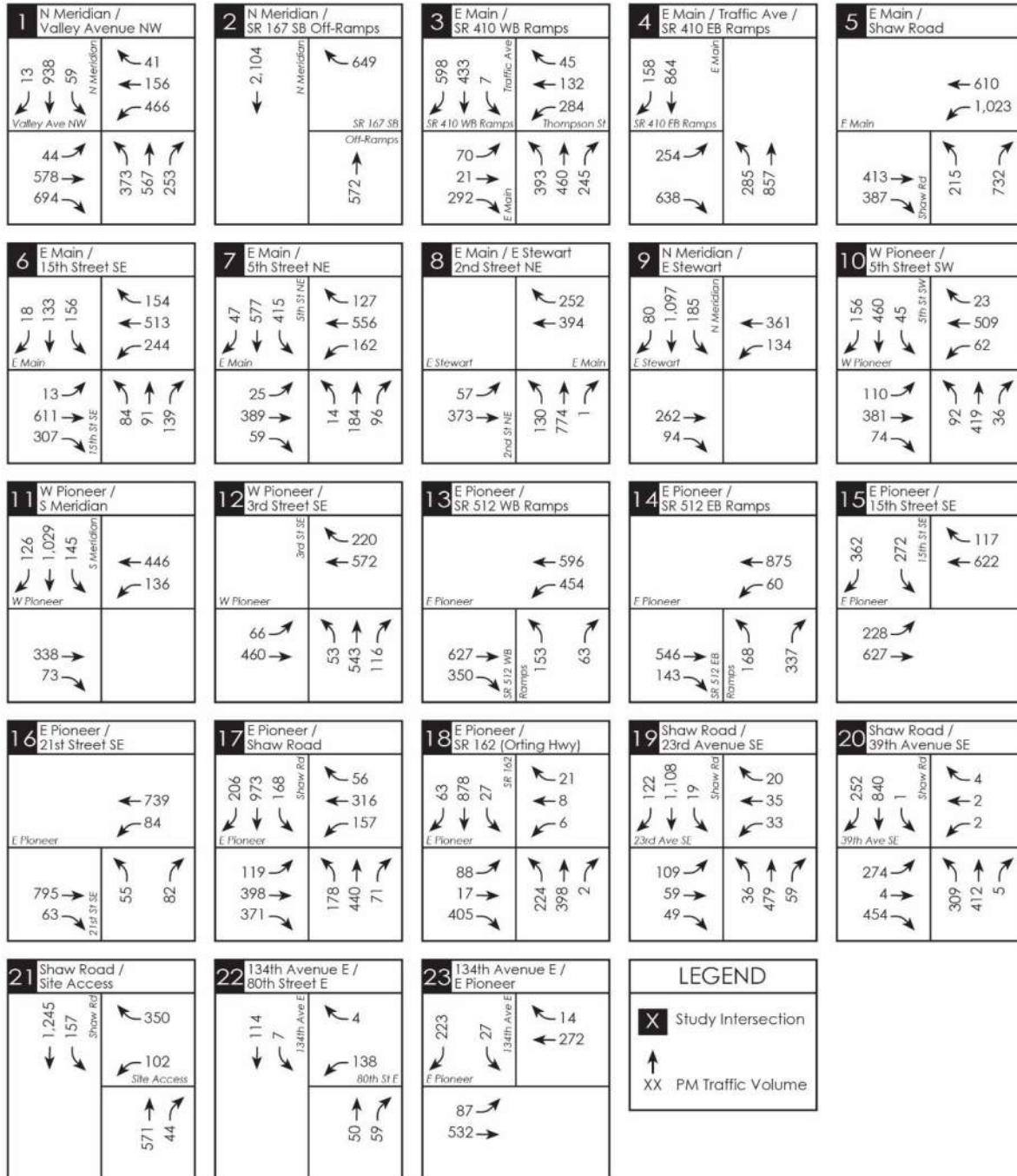


Figure 12: 2021 With-Project PM Peak Hour Traffic Volumes



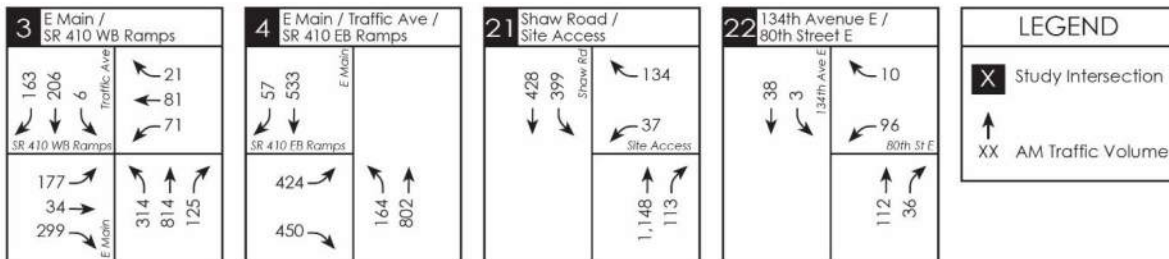


Figure 13: 2021 With-Project AM Peak Hour Traffic Volumes





**Table 4**  
**Future 2021 PM Peak Hour LOS Summary**

Study Intersections	Without-Project		With-Project	
	LOS	Delay	LOS	Delay
<u>Signalized:</u>				
1. N Meridian / Valley Ave NW	D	49.3	D	49.8
2. N Meridian / SR-167 Off-Ramps	A	7.9	A	8.3
3/4. E Main / Traffic Ave / SR-410 Ramps <sup>1</sup>	--	-	--	--
5. E Main / Shaw Road	B	18.4	C	21.7
6. E Main / 15 <sup>th</sup> Street SE	B	13.5	B	13.7
7. E Main / 5 <sup>th</sup> Street NE	C	32.3	D	35.1
8. E Main / 2 <sup>nd</sup> Street NE / E Stewart	B	11.4	B	11.6
9. N Meridian / E Stewart	C	21.4	C	21.7
10. W Pioneer / 5 <sup>th</sup> Street SW	C	34.0	D	35.5
11. W Pioneer / S Meridian	C	24.8	C	24.8
12. E Pioneer / 3 <sup>rd</sup> Street SE / W Pioneer	B	19.2	B	19.8
13. E Pioneer / SR-512 WB Ramps	B	20.0	C	31.8
14. E Pioneer / SR-512 EB Ramps	B	13.0	B	16.6
15. E Pioneer / 15 <sup>th</sup> Street SE	B	12.6	B	13.2
16. E Pioneer / 21 <sup>st</sup> Street SE	A	2.5	A	2.4
17. E Pioneer / Shaw Road	C	31.4	D	35.7
18. E Pioneer / SR-162 (Orting Hwy)	D	46.2	D	49.8
19. Shaw Road / 23 <sup>rd</sup> Street SE <sup>2</sup>	D	46.0	D	52.2
20. Shaw Road / 112 <sup>th</sup> St E / 39 <sup>th</sup> Ave SE <sup>2</sup>	E	56.3	E	58.6
<u>Site Access (future signal):</u>				
21. Shaw Road / 5 <sup>th</sup> Street SE	--	--	A	9.9
WB Left-Turn from stop sign	C	19.9	--	--
WB Right-Turn from stop sign	B	10.8	--	--
SB Left-Turns from Shaw	A	8.9	--	--
<u>Site Access (unsignalized):</u>				
22. 33rd St SE / Pioneer / 80 <sup>th</sup> Ave				
SB Turns from stop sign	A	8.9	B	10.7
EB Left-Turns from Pioneer	A	11.8	B	13.8
23. E Pioneer / 33 <sup>rd</sup> St SE				
EB Left-Turns from E Pioneer	A	8.0	A	8.1
SB Turns from stop sign	B	12.2	C	16.0

1. Intersections operating over capacity, LOS results not reported.

2. Intersection improvement planned in City of Puyallup Six Year TIP 2016-2021

As shown in **Table 4**, a majority of the signalized study intersections are anticipated to operate at LOS D or better in 2021 without or with the proposed Knutson Industrial development during the PM peak hour. The City of Puyallup has an identified TIP capacity project at two of the study intersections on Shaw Road, and both are expected to have improved LOS with the City improvements. There is also a future planned improvement at the SR-410 interchange with Traffic Ave/Main Ave; the City

of Sumner is leading the Interchange Justification Report (IJR) study to evaluate future improvements and costs.

To mitigate project impacts of the Knutson development to the study intersections based on future 2021 PM peak hour LOS evaluation with the project, payment of a proportionate-share cost is expected to be made toward future improvements at the SR-410/Main Ave/Traffic Ave interchange.

## AM Peak Hour LOS Analysis

Future AM peak hour LOS were evaluated at 2 study intersections and 2 site access locations for the anticipated year of occupancy (2021). The future roadway network assumed in the 2021 LOS analysis was based on existing intersection geometry and signal timing for a majority of the study intersections with no planned improvements. The 2021 weekday AM peak hour LOS results at the study intersection and site access locations are summarized in **Table 5**. The detailed LOS worksheets are included in **Appendix B**.

**Table 5**  
**Future 2021 AM Peak Hour LOS Summary**

Study Intersections	Without-Project		With-Project	
	LOS	Delay	LOS	Delay
<u>Signalized:</u>				
3. E Main / Traffic Ave / SR-410 WB Ramps	--	--	--	--
4. E Main / Traffic Ave / SR-410 EB Ramps	--	--	--	--
<u>Site Access (signalized with-project):</u>				
21. Shaw Road / 5 <sup>th</sup> Street SE	--	--	B	19.8
WB Left-Turn from stop sign	D	26.1	--	--
WB Right-Turn from stop sign	B	14.2	--	--
SB Left-Turns from Shaw	B	12.6	--	--
<u>Site Access (unsignalized):</u>				
22. 33rd St SE / Pioneer / 80 <sup>th</sup> Ave				
SB Turns from stop sign	B	8.8	B	11.7
EB Left-Turns from Pioneer	A	10.7	B	11.3
23. E Pioneer / 33 <sup>rd</sup> St SE				
EB Left-Turns from E Pioneer	A	8.3	A	8.6
SB Turns from stop sign	B	11.9	B	13.2

1. Intersections operating over capacity, LOS results not reported.

As shown in **Table 5**, the future signalized intersection of Shaw Road with 5<sup>th</sup> Ave SE is expected to operate at LOS A during the AM peak hour. Side-street turns from 33rd Street SE onto E Pioneer are anticipated to operate at LOS B with or without the project during the AM peak hour.

It should be noted that the project proposal remains the same as that which was evaluated in the Feb. 2, 2016 traffic analysis, and the LOS results remain the same as reported in the previous report.

## Site Access Evaluation

This section evaluates the AM and PM peak hour operation at the 2 site access locations with full project buildout, including signal warrants, evaluation of left-turn lanes, and street improvements on 5<sup>th</sup> Ave SE and 134<sup>th</sup> Ave E. Two access routes are anticipated with buildout of the Knutson farm parcels with industrial uses. Primary access would occur via the new 5<sup>th</sup> Avenue SE road connection between Shaw Road and 134<sup>th</sup> Ave E, and secondary access would use 134<sup>th</sup> Ave E with connection to E Pioneer.

### Site Access LOS

The primary access route to and from the Knutson site is expected to occur onto the new 5<sup>th</sup> Avenue SE connection with Shaw Road west of 134<sup>th</sup> Ave E. The road connection is anticipated to be constructed by the Schnitzer Industrial Development of the Van Lierop project with 5<sup>th</sup> Ave providing a new east leg to the intersection with Shaw Road. Initially the intersection is anticipated to have stop signs on the 5<sup>th</sup> Ave approach to Shaw Road with buildout of the Schnitzer Industrial Development of the Van Lierop project. As the Knutson Industrial project develops, it is expected that a signal will be warranted at that location.

As a signalized intersection, at full buildout of the Knutson development, the 5<sup>th</sup> Ave SE/Shaw Road intersection is anticipated to operate at LOS B during the PM peak hour. Shaw Road is currently a 5-lane section at the future location of 5<sup>th</sup> Ave SE, and 5<sup>th</sup> Ave SE would provide a 3-lane section with 2 lanes (westbound) approaching the signal and 1 receiving (eastbound) lane.

The secondary access route to/from the Knutson site is anticipated to use 134<sup>th</sup> Ave E (called 33<sup>rd</sup> Street SE by City Puyallup) at its current intersection with E Pioneer. Based on the LOS analysis described previously, this intersection is expected to operate at LOS B or better during the PM peak hour with buildout of the Knutson Industrial development. It is expected that the existing lane configuration and geometry would remain the same at full buildout of the Knutson development. Consideration may also be given to restricting Knutson trucks from using the southern access via 134<sup>th</sup> Ave E.

It should also be noted that if the Schnitzer Industrial Development of the Van Lierop project is not constructed, the Knutson development will be required to construct necessary improvements to gain access to Shaw Road and E Pioneer.

### Signal Warrants

With buildout of the proposed Knutson Industrial development, and the approved Schnitzer Industrial Development of the Van Lierop project, a comprehensive traffic signal warrant analysis was conducted at the 5<sup>th</sup> Ave SE intersection with Shaw Road. The analysis was based on traffic signal warrants identified in the US Department of Transportation/Federal Highway Administration, *Manual on Uniform Traffic Control Devices (MUTCD)*, 2003 edition. Of the eight signal warrants outlined in the MUTCD, Warrant 1 (Eight-Hour Vehicular Volume), Warrant 2 (Four-Hour Vehicular Volume), and Warrant 3 (Peak Hour) were analyzed in this study. The detailed analysis results are provided in Appendix D.

The MUTCD signal warrants chapter specifies that if the minor street traffic turning left versus right is not 50/50, it can be analyzed as a single-lane approach. It is anticipated that approximately 80 percent of the vehicles exiting at the intersection will be right-turning vehicles. Therefore, it was analyzed as a single-lane approach.

The results of the signal warrant analysis are summarized in **Table 6** next.

**Table 6**  
**Signal Warrant Analysis Results at Shaw Road/5<sup>th</sup> Ave SE**

Warrant	2018 Conditions
Warrant 1 – Eight-Hour Vehicular Volume	
Condition A – Minimum Vehicular Volume	NO
Condition B – Interruption of Continuous Traffic	YES
<b>Warrant 1 Met?</b>	
<b>YES</b>	
Warrant 2 – Four-Hour Vehicular Volume	
<b>Warrant 2 Met?</b>	
<b>YES</b>	
Warrant 3 – Peak Hour	
Condition A	NO
Condition B	YES
<b>Warrant 3 Met?</b>	
<b>YES</b>	

As shown in **Table 6**, based on future 2018 traffic volumes with about 1.3M sf of building area development from the Knutson project, a signal would be warranted. All three signal warrants evaluated (Warrant 1 – Eight Hour, Warrant 2 – Four Hour, and Warrant 3 – Peak Hour) are expected to be met at the 5<sup>th</sup> Ave SE intersection with Shaw Road.

### Left-Turn Lane Analysis

The need for a two-way left-turn lane along 134<sup>th</sup> Avenue E with the Knutson development was evaluated using the *HRR 211 Warrant for Left-Turn Storage Lanes on Two-Lane Highways*. Based on the estimated percentage of left-turning vehicles, advancing volume, and opposing volume at the site driveways, a two-way left-turn lane is not warranted along the section of 134<sup>th</sup> Ave E between 80<sup>th</sup> Street E (south) and the north access turnaround. The detailed left-turn lane analyses are provided in **Appendix E**.

### Street Improvements

The northern half street portion of 5th Avenue SE between Shaw Road and 134<sup>th</sup> Ave E (33rd Street SE) is anticipated to be constructed by the Schnitzer Industrial Development of the Van Lierop project as a Commercial Collector road. The east half of 134<sup>th</sup> Ave E on the Van Lierop east property edge is also anticipated to be constructed as a half-street Commercial Collector road consistent with City roadway standards.

The Knutson development would construct the remaining portions of 134<sup>th</sup> Ave E north of 5<sup>th</sup> Ave SE and south to 74<sup>th</sup> Street E consistent with Pierce County roadway standard PC.A1.1 which would include 32 feet pavement width (two 12-foot lanes with 4-foot shoulders), new curb/gutter, and 6-foot sidewalks. With 5<sup>th</sup> Avenue SE being the primary access road for the Knutson development, the full street section along this section would be constructed with the first phase of the development.

134<sup>th</sup> Ave E south of 74<sup>th</sup> to 80<sup>th</sup> Street E is proposed to be upgraded to provide 32-feet of pavement width (two 12-foot lanes with 4-foot shoulders) and 4-foot storm ditches on both sides within the existing 40-foot right-of-way. This pavement road section would be consistent with PC.A1.1 and is expected to be developed to its full standard as those properties develop to add the curb/gutter/sidewalk. The 32-foot pavement width would be adequate to provide a minimum width to accommodate fire trucks.

80<sup>th</sup> Street E will be improved on the northern portion of the Knutson frontage to include 6-foot sidewalk, curb/gutter, 4-foot shoulder and 12-foot travel lane on north side, along with 5-foot ROW dedication.

The detailed roadway cross-sections for the portions of 134<sup>th</sup> Avenue E and half street of 80<sup>th</sup> Street E are provided in **Appendix F**.

## PROJECT MITIGATION MEASURES

The following summarizes the measures proposed to mitigate the transportation impacts of the proposed Knutson Industrial development.

### Traffic Impact Fee

To mitigate long-term transportation impacts, the County administers a Traffic Impact Fee (TIF) to new developments to improve the transportation system to accommodate the higher travel demand added by new development. County Ordinance 2006-60s identifies traffic impact fees for general manufacturing and warehouse uses, but does not have a traffic impact fee rate for high-cube warehouse-distribution center. The traffic impact fee rates vary depending on zone location. The Knutson Industrial development is located in Zone 5.

The current traffic impact fee rate for a manufacturing use in Zone 5 is \$0.79 per sf of building area; and that rate is further reduced by 90 percent for a manufacturing use located in an Employment Center. The traffic impact fee rate for a warehouse use in Zone 5 is \$1.03 per sf of building area.

The high-cube warehouse-distribution center does not have a specific category identified in the County's Ordinance. As a result, an independent traffic impact fee calculation is proposed consistent with County Ordinance allowances. The daily trip rate of 1.68 was used for LUC 152 (high-cube distribution center) from the *ITE Trip Generation manual* (9<sup>th</sup> edition). The calculation also uses the 90 percent new trip rate, the 1.37 trip length adjustment factor, and the \$167.84 cost per trip (zone 5). All of these are standard factors applied to the ITE trip rate for LUC 152. The resulting independent traffic impact fee for high-cube warehouse-distribution center would be \$0.35 per sf of building area.

The traffic impact fees will be determined at the time of application for building permits, and is subject to rates in effect at that time.

### Off-Site LOS Impact

To mitigate project impacts to the study intersections based on future 2021 PM peak hour LOS evaluation with the project, payment of a proportionate-share cost would be made toward future improvements at the SR-410/Main Ave/Traffic Ave interchange.

### Site Access

To mitigate project impacts to site access, a traffic signal would be constructed at the Shaw Road/5<sup>th</sup> Ave E intersection with approximately 1.3M square feet of building area for the Knutson development.

### Street Improvements

The Knutson development would be required to construct street improvements to buildout 5<sup>th</sup> Avenue SE to a full Collector Arterial between Shaw Road and 134<sup>th</sup> Ave E (33<sup>rd</sup> Street SE) with the first phase of development. The Knutson development would construct the remaining portions of 134<sup>th</sup> Ave E north of 5<sup>th</sup> Ave SE and south to 74<sup>th</sup> Street E consistent with Pierce County roadway standard PC.A1.1 which would include 32 feet pavement width (two 12-foot lanes with 4-foot shoulders), new curb/gutter, and 6-foot sidewalks. 134<sup>th</sup> Ave E south of 74<sup>th</sup> to 80<sup>th</sup> Street E would be upgraded to provide 32-feet of pavement width (two 12-foot lanes with 4-foot shoulders) and 4-foot storm ditches on both sides within the 40-foot right-of-way. 80<sup>th</sup> Street E will be improved on the northern portion of the Knutson frontage to include 6-foot sidewalk, curb/gutter, 4-foot shoulder and 12-foot travel lane on north side, along with 5-foot ROW dedication.

# Appendix A

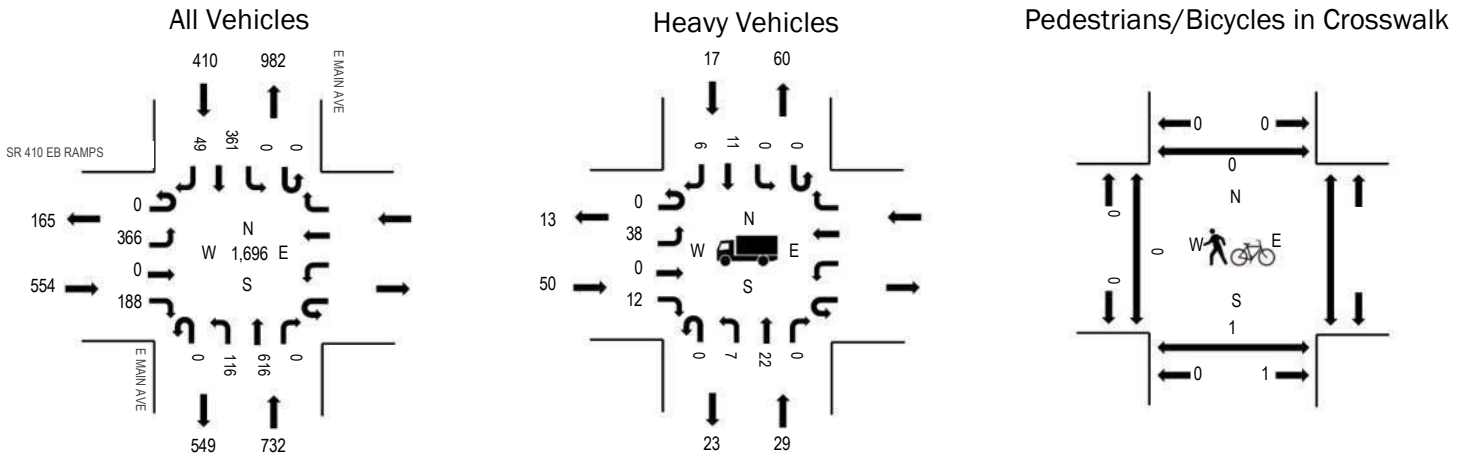
## Traffic Count Data



Location: 3 E MAIN AVE & SR 410 EB RAMPS AM  
 Date and Start Time: Wednesday, January 6, 2016  
 Peak Hour: 07:30 AM - 08:30 AM

(303) 216-2439  
 www.alltrafficdata.net

**Peak Hour**



	HV%	PHF
EB	9.0%	0.93
WB		
NB	4.0%	0.90
SB	4.1%	0.93
All	5.7%	0.97

**Traffic Counts - All Vehicles**

Interval Start Time	SR 410 EB RAMPS				Westbound				E MAIN AVE Northbound				E MAIN AVE Southbound				Total	Rolling Hour
	Eastbound				U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
	U-Turn	Left	Thru	Right														
7:00:00 AM	0	81	0	28					0	19	148	0	0	0	58	9	343	1,597
7:15:00 AM	0	88	0	37					0	28	157	0	0	0	80	16	406	1,689
7:30:00 AM	0	83	0	49					0	36	131	0	0	0	101	9	409	1,696
7:45:00 AM	0	91	0	45					0	26	178	0	0	0	91	8	439	1,670
8:00:00 AM	0	100	0	49					0	25	170	0	0	0	75	16	435	1,670
8:15:00 AM	0	92	0	45					0	29	137	0	0	0	94	16	413	
8:30:00 AM	0	73	0	31					0	37	143	0	0	0	80	19	383	
8:45:00 AM	0	92	0	45					0	35	149	0	0	0	98	20	439	
Count Total	0	700	0	329					0	235	1,213	0	0	0	677	113	3,267	
Peak Hour	0	366	0	188					0	116	616	0	0	0	361	49	1,696	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
7:00:00 AM	4		1	1	6	0		0	0	0
7:15:00 AM	16		5	4	25	0		0	0	0
7:30:00 AM	14		7	4	25	0		1	0	1
7:45:00 AM	11		7	3	21	0		0	0	0
8:00:00 AM	13		9	5	27	0		0	0	0
8:15:00 AM	12		6	5	23	0		0	0	0
8:30:00 AM	15		6	5	26	0		3	0	3
8:45:00 AM	14		7	7	28	0		0	0	0
Count Total	99		48	34	181	0		4	0	4
Peak Hour	50		29	17	96	0		1	0	1

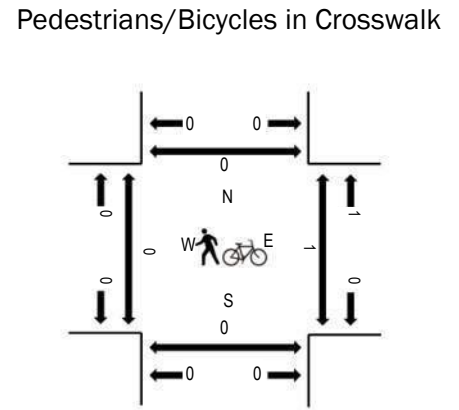
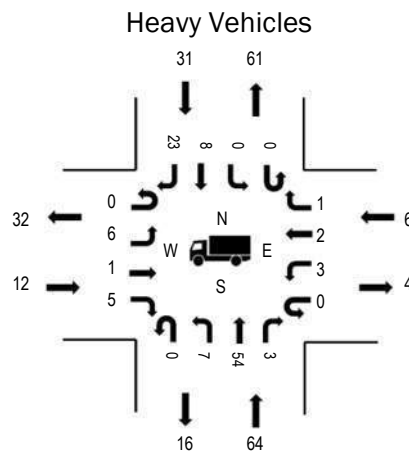
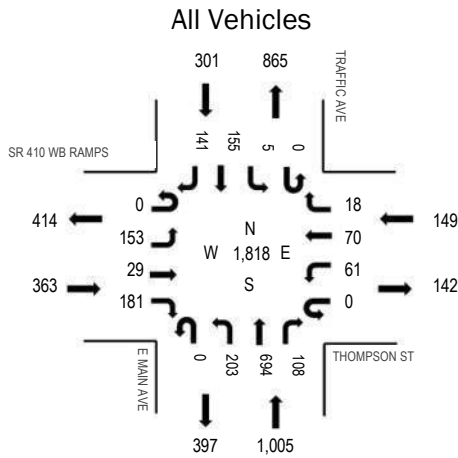




(303) 216-2439  
www.alltrafficdata.net

Location: 4 E MAIN AVE & THOMPSON ST AM  
Date and Start Time: Wednesday, January 6, 2016  
Peak Hour: 07:15 AM - 08:15 AM

**Peak Hour**



	HV%	PHF
EB	3.3%	0.84
WB	4.0%	0.70
NB	6.4%	0.92
SB	10.3%	0.86
All	6.2%	0.97

**Traffic Counts - All Vehicles**

Interval Start Time	SR 410 WB RAMPs				THOMPSON ST				E MAIN AVE				TRAFFIC AVE				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00:00 AM	0	48	10	29	0	11	14	4	0	57	130	47	0	0	20	32	402	1,753
7:15:00 AM	0	43	10	34	0	20	27	6	0	58	164	28	0	1	41	34	466	1,818
7:30:00 AM	0	42	7	59	0	13	18	4	0	38	156	18	0	0	42	32	429	1,799
7:45:00 AM	0	27	12	46	0	17	13	4	0	49	184	40	0	3	35	26	456	1,775
8:00:00 AM	0	41	0	42	0	11	12	4	0	58	190	22	0	1	37	49	467	1,768
8:15:00 AM	0	40	8	51	0	19	15	5	0	59	138	34	0	1	39	38	447	
8:30:00 AM	0	18	3	35	0	31	18	9	0	59	115	36	0	5	36	40	405	
8:45:00 AM	0	23	2	49	0	14	8	5	0	56	147	42	0	3	53	47	449	
Count Total	0	282	52	345	0	136	125	41	0	434	1,224	267	0	14	303	298	3,521	
Peak Hour	0	153	29	181	0	61	70	18	0	203	694	108	0	5	155	141	1,818	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

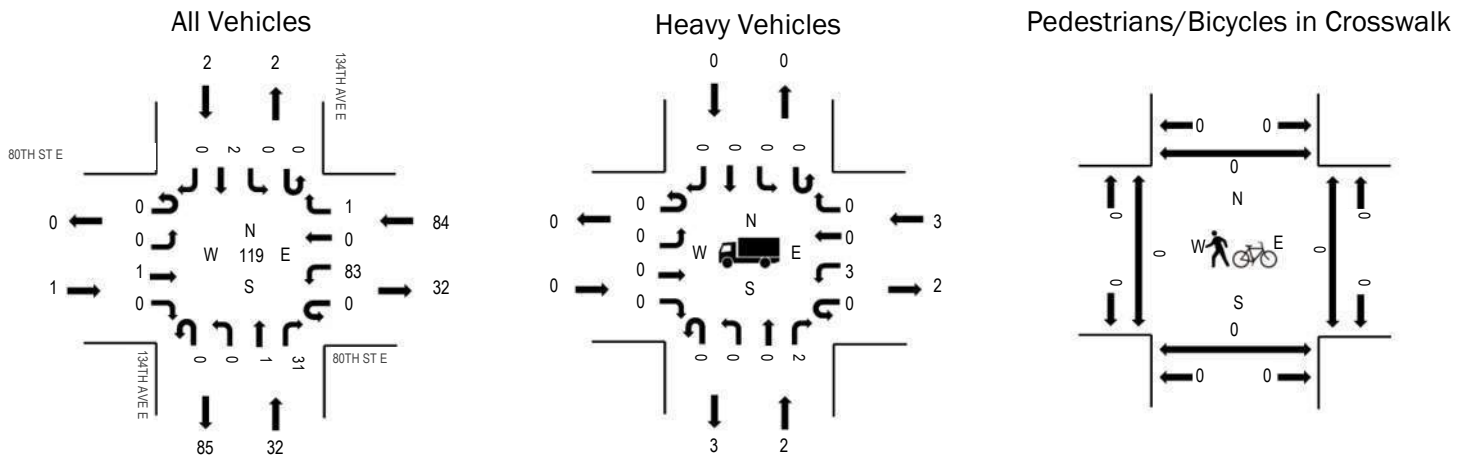
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
7:00:00 AM	1	1	4	1	7	0	0	0	0	0
7:15:00 AM	4	2	14	4	24	0	0	0	0	0
7:30:00 AM	1	2	18	10	31	0	0	0	0	0
7:45:00 AM	2	1	15	4	22	0	0	0	0	0
8:00:00 AM	5	1	17	13	36	0	1	0	0	1
8:15:00 AM	3	2	12	18	35	0	1	0	0	1
8:30:00 AM	1	6	19	14	40	0	3	0	0	3
8:45:00 AM	1	2	17	21	41	0	0	0	0	0
Count Total	18	17	116	85	236	0	5	0	0	5
Peak Hour	12	6	64	31	113	0	1	0	0	1



(303) 216-2439  
www.alltrafficdata.net

Location: 6 134TH AVE E & 80TH ST E AM  
Date and Start Time: Wednesday, January 6, 2016  
Peak Hour: 07:15 AM - 08:15 AM

**Peak Hour**



	HV%	PHF
EB	0.0%	0.25
WB	3.6%	0.70
NB	6.3%	0.80
SB	0.0%	0.50
All	4.2%	0.83

**Traffic Counts - All Vehicles**

Interval Start Time	80TH ST E Eastbound				80TH ST E Westbound				134TH AVE E Northbound				134TH AVE E Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00:00 AM	0	0	1	0	0	12	0	0	0	0	1	8	0	0	1	0	23	117
7:15:00 AM	0	0	0	0	0	20	0	0	0	0	0	8	0	0	1	0	29	119
7:30:00 AM	0	0	0	0	0	30	0	0	0	0	0	6	0	0	0	0	36	113
7:45:00 AM	0	0	0	0	0	17	0	1	0	0	0	10	0	0	1	0	29	112
8:00:00 AM	0	0	1	0	0	16	0	0	0	0	1	7	0	0	0	0	25	119
8:15:00 AM	0	0	0	0	0	16	0	0	0	0	1	5	0	1	0	0	23	
8:30:00 AM	0	0	0	0	0	28	0	2	0	0	0	5	0	0	0	0	35	
8:45:00 AM	0	0	0	0	0	21	0	0	0	0	2	12	0	0	1	0	36	
Count Total	0	0	2	0	0	160	0	3	0	0	5	61	0	1	4	0	236	
Peak Hour	0	0	1	0	0	83	0	1	0	0	1	31	0	0	2	0	119	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

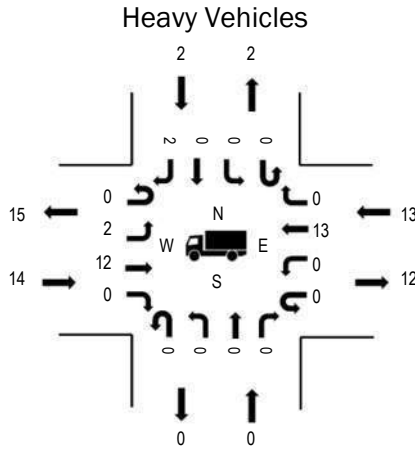
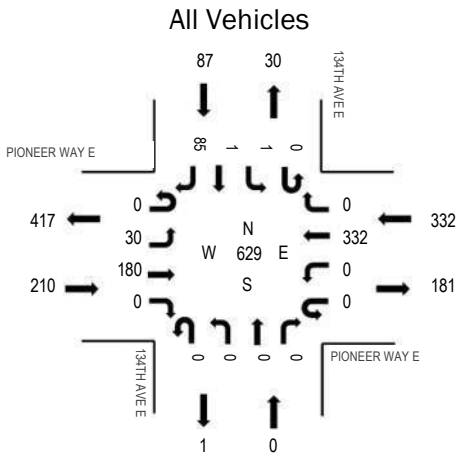
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
7:00:00 AM	0	0	0	0	0	0	0	0	0	0
7:15:00 AM	0	0	1	0	1	0	0	0	0	0
7:30:00 AM	0	1	0	0	1	0	0	0	0	0
7:45:00 AM	0	1	1	0	2	0	0	0	0	0
8:00:00 AM	0	1	0	0	1	0	0	0	0	0
8:15:00 AM	0	1	2	0	3	0	0	0	0	0
8:30:00 AM	0	0	0	0	0	0	0	0	0	0
8:45:00 AM	0	1	0	0	1	0	0	0	0	0
Count Total	0	5	4	0	9	0	0	0	0	0
Peak Hour	0	3	2	0	5	0	0	0	0	0



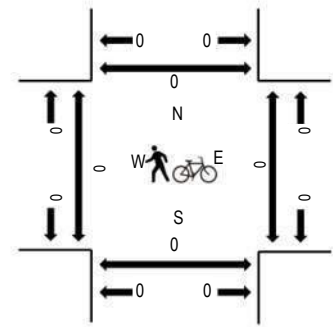
Location: 5 134TH AVE E & PIONEER WAY E AM  
 Date and Start Time: Wednesday, January 6, 2016  
 Peak Hour: 07:15 AM - 08:15 AM

(303) 216-2439  
 www.alltrafficdata.net

**Peak Hour**



**Pedestrians/Bicycles in Crosswalk**



	HV%	PHF
EB	6.7%	0.89
WB	3.9%	0.78
NB		0.00
SB	2.3%	0.75
All	4.6%	0.90

**Traffic Counts - All Vehicles**

Interval Start Time	PIONEER WAY E Eastbound				PIONEER WAY E Westbound				134TH AVE E Northbound				134TH AVE E Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00:00 AM	0	9	41	0	0	0	68	0	0	0	0	0	0	0	0	12	130	626
7:15:00 AM	0	7	38	0	0	0	107	0	0	0	0	0	0	0	1	22	175	629
7:30:00 AM	0	6	42	0	0	0	95	0	0	0	0	0	0	0	0	29	172	602
7:45:00 AM	0	10	49	0	0	0	70	0	0	0	0	0	1	0	19	149	576	
8:00:00 AM	0	7	51	0	0	0	60	0	0	0	0	0	0	0	15	133	583	
8:15:00 AM	0	5	43	0	0	0	85	1	0	0	0	0	0	0	14	148		
8:30:00 AM	0	5	36	0	0	0	72	0	0	0	0	0	0	0	33	146		
8:45:00 AM	0	15	42	0	0	0	77	1	0	0	0	0	2	0	19	156		
Count Total	0	64	342	0	0	0	634	2	0	0	0	0	3	1	163	1,209		
Peak Hour	0	30	180	0	0	0	332	0	0	0	0	0	1	1	85	629		

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

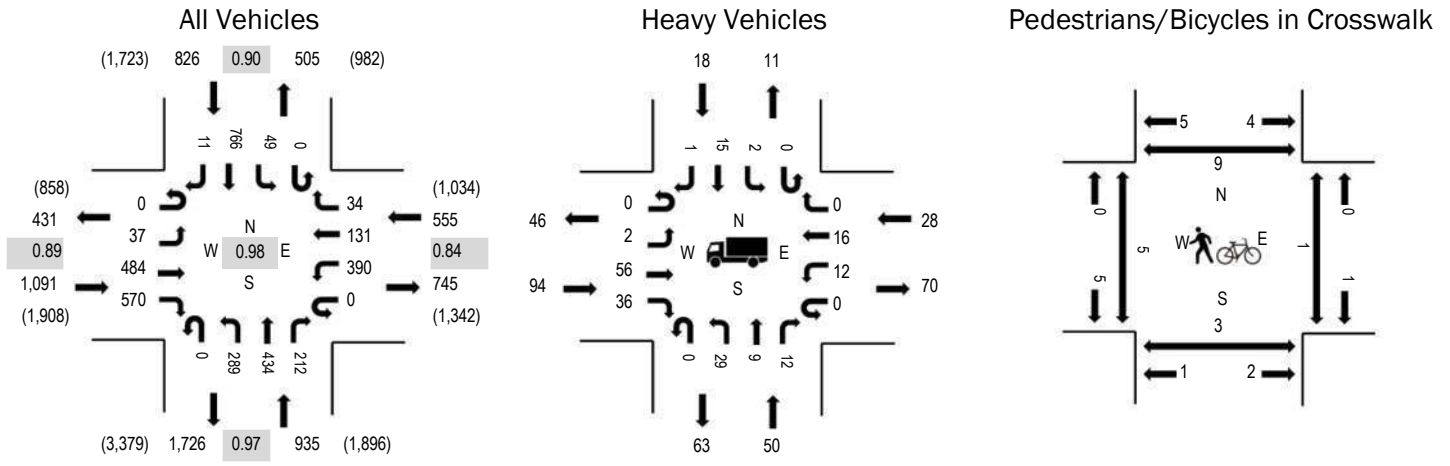
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
7:00:00 AM	2	4	0	0	6	0	0	0	0	0
7:15:00 AM	4	2	0	0	6	0	0	0	0	0
7:30:00 AM	2	5	0	1	8	0	0	0	0	0
7:45:00 AM	3	4	0	1	8	0	0	0	0	0
8:00:00 AM	5	2	0	0	7	0	0	0	0	0
8:15:00 AM	7	4	0	0	11	0	0	0	0	0
8:30:00 AM	3	2	0	1	6	0	0	0	0	0
8:45:00 AM	2	6	0	1	9	0	0	0	0	0
Count Total	28	29	0	4	61	0	0	0	0	0
Peak Hour	14	13	0	2	29	0	0	0	0	0



(303) 216-2439  
www.alltrafficdata.net

Location: 6 N MERIDIAN & VALLEY AVE NW PM  
Date and Start Time: Tuesday, November 3, 2015  
Peak Hour: 04:30 PM - 05:30 PM  
Peak 15-Minutes: 04:45 PM - 05:00 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	8.6%	0.89
WB	5.0%	0.84
NB	5.3%	0.97
SB	2.2%	0.90
All	5.6%	0.98

**Traffic Counts - All Vehicles**

Interval Start Time	VALLEY AVE NW Eastbound				VALLEY AVE NW Westbound				N MERIDIAN Northbound				N MERIDIAN Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	6	62	141	0	103	36	3	0	79	121	54	0	23	178	3	809	3,315
4:15:00 PM	0	4	105	117	0	91	34	4	0	62	113	60	0	15	176	13	794	3,330
4:30:00 PM	0	9	130	168	0	85	27	6	0	71	101	52	0	12	177	2	840	3,407
4:45:00 PM	0	11	124	140	0	118	37	10	0	67	127	43	0	17	177	1	872	3,348
5:00:00 PM	0	10	97	135	0	86	34	11	0	75	107	59	0	8	197	5	824	3,246
5:15:00 PM	0	7	133	127	0	101	33	7	0	76	99	58	0	12	215	3	871	
5:30:00 PM	0	6	101	95	0	85	23	4	0	75	93	54	0	7	233	5	781	
5:45:00 PM	0	0	46	134	0	69	23	4	0	69	119	62	0	8	231	5	770	
Count Total	0	53	798	1,057	0	738	247	49	0	574	880	442	0	102	1,584	37	6,561	
Peak Hour	0	37	484	570	0	390	131	34	0	289	434	212	0	49	766	11	3,407	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

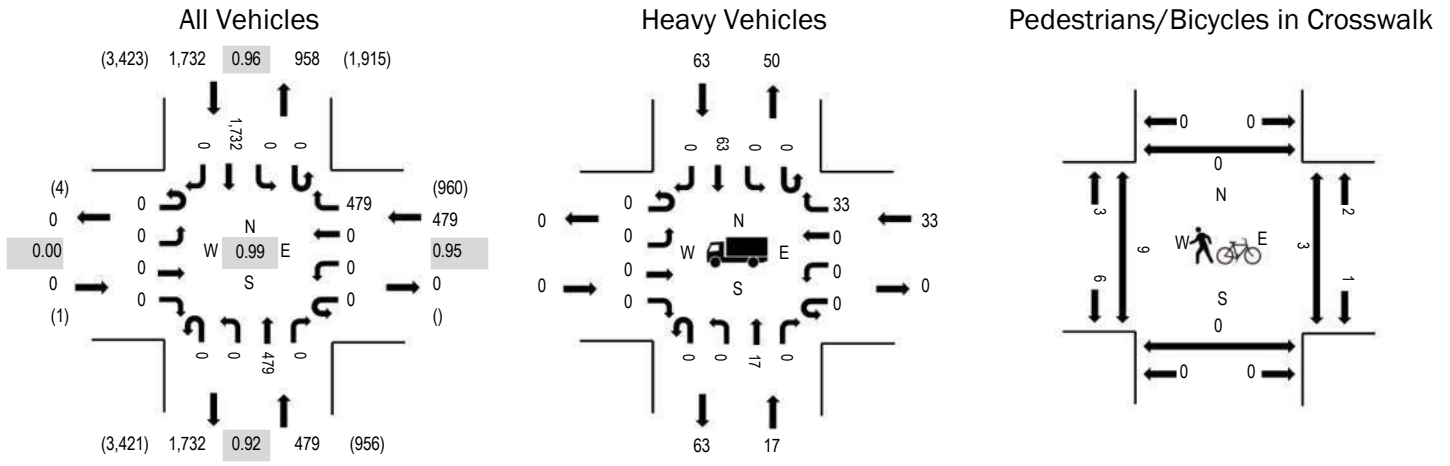
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	27	7	19	13	66	0	0	1	0	1
4:15:00 PM	19	7	19	5	50	0	2	4	0	6
4:30:00 PM	28	8	15	5	56	2	0	1	5	8
4:45:00 PM	26	6	8	3	43	3	1	2	2	8
5:00:00 PM	18	8	19	4	49	0	0	0	2	2
5:15:00 PM	22	6	8	6	42	0	0	0	0	0
5:30:00 PM	11	6	16	4	37	2	0	1	2	5
5:45:00 PM	8	4	14	3	29	0	0	0	0	0
Count Total	159	52	118	43	372	7	3	9	11	30
Peak Hour	94	28	50	18	190	5	1	3	9	18



(303) 216-2439  
www.alltrafficdata.net

Location: 5B N MERIDIAN & SR 167 SB OFF RAMP PM  
Date and Start Time: Tuesday, November 3, 2015  
Peak Hour: 04:30 PM - 05:30 PM  
Peak 15-Minutes: 04:30 PM - 04:45 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB		0.00
WB	6.9%	0.95
NB	3.5%	0.92
SB	3.6%	0.96
All	4.2%	0.99

**Traffic Counts - All Vehicles**

Interval Start Time	BRIDGE ACCESS Eastbound				SR 167 SB OFF RAMP Westbound				N MERIDIAN Northbound				N MERIDIAN Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	0	0	0	0	0	0	120	0	0	134	0	0	0	432	0	686	2,676
4:15:00 PM	0	0	0	1	0	0	0	121	1	0	122	0	0	0	388	0	633	2,648
4:30:00 PM	0	0	0	0	0	0	0	126	0	0	106	0	0	0	450	0	682	2,690
4:45:00 PM	0	0	0	0	0	0	0	114	0	0	121	0	0	0	440	0	675	2,670
5:00:00 PM	0	0	0	0	0	0	0	124	0	0	122	0	0	0	412	0	658	2,664
5:15:00 PM	0	0	0	0	0	0	0	115	0	0	130	0	0	0	430	0	675	
5:30:00 PM	0	0	0	0	0	0	0	120	0	0	98	0	0	0	440	4	662	
5:45:00 PM	0	0	0	0	0	0	0	120	0	0	122	0	0	0	427	0	669	
Count Total	0	0	0	1	0	0	0	960	1	0	955	0	0	0	3,419	4	5,340	
Peak Hour	0	0	0	0	0	0	0	479	0	0	479	0	0	0	1,732	0	2,690	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

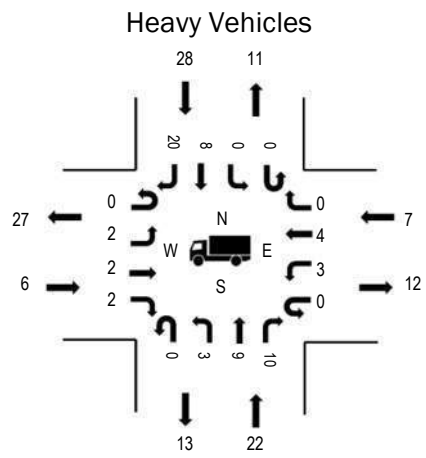
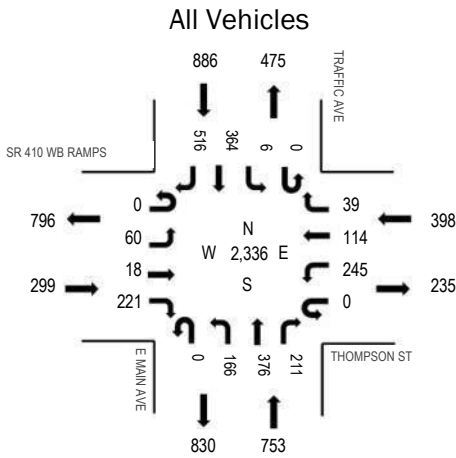
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	0	13	3	32	48	2	2	0	0	4
4:15:00 PM	0	16	2	17	35	3	0	0	0	3
4:30:00 PM	0	10	7	21	38	2	0	0	0	2
4:45:00 PM	0	7	1	12	20	6	1	0	0	7
5:00:00 PM	0	8	8	15	31	0	2	0	0	2
5:15:00 PM	0	8	1	15	24	1	0	0	0	1
5:30:00 PM	0	10	1	15	26	1	1	0	0	2
5:45:00 PM	0	11	2	11	24	0	1	0	0	1
Count Total	0	83	25	138	246	15	7	0	0	22
Peak Hour	0	33	17	63	113	9	3	0	0	12



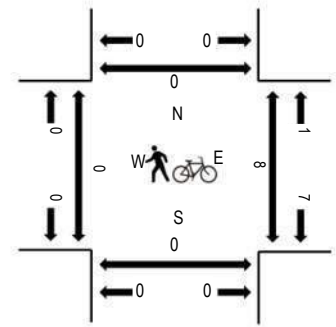
(303) 216-2439  
www.alltrafficdata.net

Location: 4 E MAIN AVE & THOMPSON ST PM  
Date and Start Time: Wednesday, January 6, 2016  
Peak Hour: 04:00 PM - 05:00 PM

**Peak Hour**



**Pedestrians/Bicycles in Crosswalk**



	HV%	PHF
EB	2.0%	0.84
WB	1.8%	0.84
NB	2.9%	0.95
SB	3.2%	0.88
All	2.7%	0.95

**Traffic Counts - All Vehicles**

Interval Start Time	SR 410 WB RAMP				THOMPSON ST				E MAIN AVE				TRAFFIC AVE				Total	Rolling Hour
	Eastbound				Westbound				Northbound				Southbound					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	12	5	53	0	57	24	11	0	45	101	53	0	1	107	145	614	2,336
4:15:00 PM	0	19	7	43	0	57	25	5	0	43	90	53	0	2	103	114	561	2,302
4:30:00 PM	0	14	2	55	0	72	37	10	0	46	92	51	0	2	72	139	592	2,305
4:45:00 PM	0	15	4	70	0	59	28	13	0	32	93	54	0	1	82	118	569	2,244
5:00:00 PM	0	16	6	54	0	71	50	3	0	54	75	49	0	0	77	125	580	2,204
5:15:00 PM	0	16	5	35	0	80	35	1	0	52	78	58	0	1	77	126	564	
5:30:00 PM	0	14	6	41	0	78	22	2	0	43	87	43	0	1	91	103	531	
5:45:00 PM	0	14	7	59	0	66	29	1	0	29	89	44	0	2	100	89	529	
Count Total	0	120	42	410	0	540	250	46	0	344	705	405	0	10	709	959	4,540	
Peak Hour	0	60	18	221	0	245	114	39	0	166	376	211	0	6	364	516	2,336	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

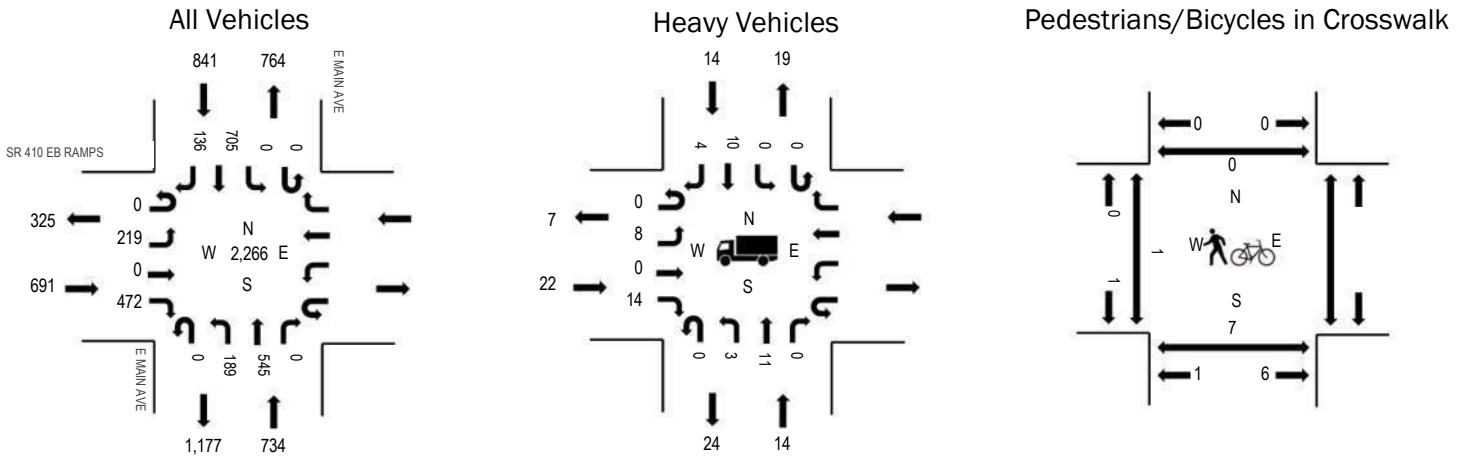
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	0	1	4	9	14	0	0	0	0	0
4:15:00 PM	2	1	8	7	18	0	4	0	0	4
4:30:00 PM	2	2	7	6	17	0	1	0	0	1
4:45:00 PM	2	3	3	6	14	0	3	0	0	3
5:00:00 PM	0	2	8	7	17	0	2	0	0	2
5:15:00 PM	1	2	5	6	14	0	1	0	0	1
5:30:00 PM	0	1	6	5	12	0	2	0	0	2
5:45:00 PM	2	2	2	4	10	0	1	0	0	1
Count Total	9	14	43	50	116	0	14	0	0	14
Peak Hour	6	7	22	28	63	0	8	0	0	8



Location: 3 E MAIN AVE & SR 410 EB RAMPS PM  
 Date and Start Time: Wednesday, January 6, 2016  
 Peak Hour: 04:00 PM - 05:00 PM

(303) 216-2439  
 www.alltrafficdata.net

**Peak Hour**



	HV%	PHF
EB	3.2%	0.95
WB		
NB	1.9%	0.96
SB	1.7%	0.97
All	2.2%	0.97

**Traffic Counts - All Vehicles**

Interval Start Time	SR 410 EB RAMPS				Westbound				E MAIN AVE Northbound				E MAIN AVE Southbound				Total	Rolling Hour
	Eastbound				U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
	U-Turn	Left	Thru	Right														
4:00:00 PM	0	64	0	94					0	47	134	0	0	0	176	40	555	2,266
4:15:00 PM	0	54	0	119					0	49	142	0	0	0	172	33	569	2,261
4:30:00 PM	0	49	0	133					0	45	129	0	0	0	167	36	559	2,257
4:45:00 PM	0	52	0	126					0	48	140	0	0	0	190	27	583	2,240
5:00:00 PM	0	55	0	137					0	35	119	0	0	0	177	27	550	2,190
5:15:00 PM	0	46	0	123					0	45	151	0	0	0	168	32	565	
5:30:00 PM	0	50	0	120					0	49	113	0	0	0	174	36	542	
5:45:00 PM	0	55	0	121					0	39	107	0	0	0	181	30	533	
Count Total	0	425	0	973					0	357	1,035	0	0	0	1,405	261	4,456	
Peak Hour	0	219	0	472					0	189	545	0	0	0	705	136	2,266	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	4		5	3	12	0		2	0	2
4:15:00 PM	6		3	1	10	1		1	0	2
4:30:00 PM	7		3	5	15	0		3	0	3
4:45:00 PM	5		3	5	13	0		1	0	1
5:00:00 PM	8		3	3	14	0		1	0	1
5:15:00 PM	11		3	3	17	0		0	0	0
5:30:00 PM	3		2	4	9	0		1	0	1
5:45:00 PM	6		0	1	7	0		1	0	1
Count Total	50		22	25	97	1		10	0	11
Peak Hour	22		14	14	50	1		7	0	8

**Peak Hour Summary**

Site ID: 9



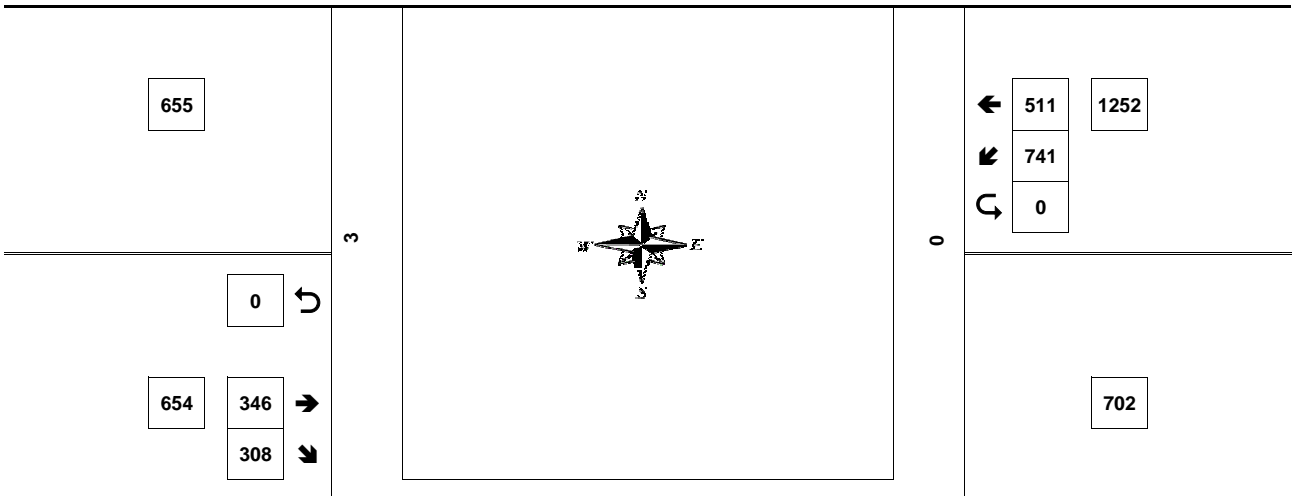
Eric Boivin  
(303) 668-0220

**SHAW RD E & E MAIN AVE**

4:15 PM to 5:15 PM  
Thursday, January 29, 2015

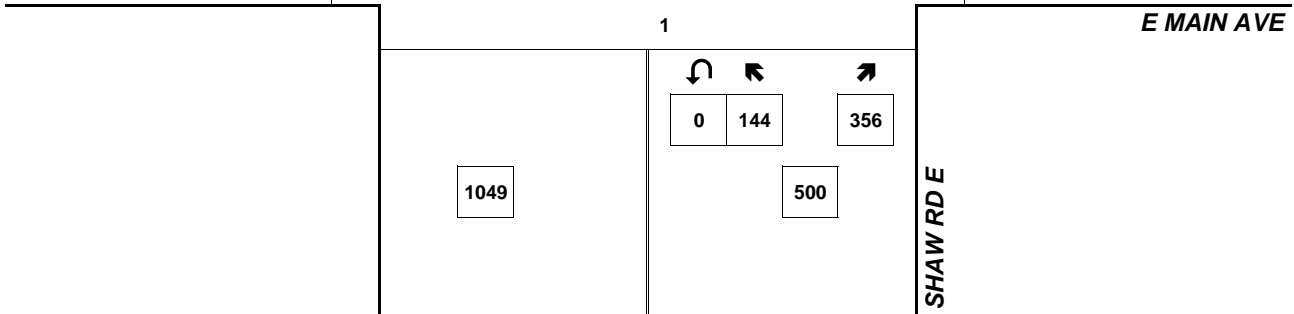
**E MAIN AVE**

0



1

**E MAIN AVE**



Approach	PHF	HV%	Volume
EB	0.87	2.3%	654
WB	0.92	1.4%	1,252
NB	0.97	1.4%	500
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.93</b>	<b>1.6%</b>	<b>2,406</b>

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



# Total Vehicle Summary



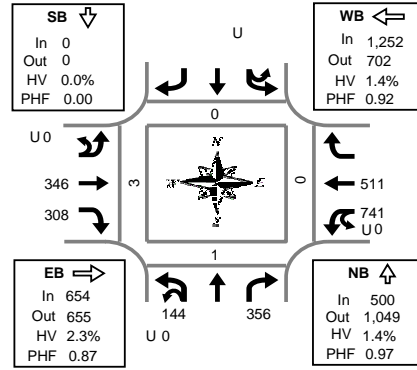
Eric Boivin  
(303) 668-0220

Site ID: 9

## SHAW RD E & E MAIN AVE

Thursday, January 29, 2015

4:00 PM to 6:00 PM



**Peak Hour Summary**  
4:15 PM to 5:15 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound SHAW RD E			Southbound n/a				Eastbound E MAIN AVE			Westbound E MAIN AVE			Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)		
	U	L	R					U	T	R	U	L	T		South	East	West
4:00 PM	0	36	68					0	75	53	0	174	104	510	0	0	0
4:15 PM	0	39	82					0	77	68	0	193	113	572	0	0	0
4:30 PM	0	45	78					0	102	87	0	173	113	598	1	0	3
4:45 PM	0	30	97					0	69	76	0	179	139	590	0	0	0
5:00 PM	0	30	99					0	98	77	0	196	146	646	0	0	0
5:15 PM	0	23	82					0	85	65	0	193	101	549	0	0	0
5:30 PM	0	11	30					0	91	89	0	185	103	509	1	0	0
5:45 PM	0	15	30					0	74	65	0	198	91	473	0	0	0
Total Survey	0	229	566					0	671	580	0	1,491	910	4,447	2	0	3

### Peak Hour Summary

4:15 PM to 5:15 PM

By Approach	Northbound SHAW RD E				Southbound n/a				Eastbound E MAIN AVE				Westbound E MAIN AVE				Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV		North	South	East	West
Volume	500	1,049	1,549	7	0	0	0	0	654	655	1,309	15	1,252	702	1,954	17	2,406	0	1	0	3
%HV		1.4%				0.0%				2.3%				1.4%			1.6%				
PHF		0.97				0.00				0.87				0.92			0.93				

By Movement	Northbound SHAW RD E			Southbound n/a				Eastbound E MAIN AVE			Westbound E MAIN AVE			Total
	U	L	R					U	T	R	U	L	T	
Volume	0	144	356					0	346	308	0	741	511	2,406
%HV	0.0%	2.1%	1.1%					0.0%	3.2%	1.3%	0.0%	0.8%	2.2%	1.6%
PHF	0.00	0.80	0.90					0.00	0.85	0.89	0.00	0.95	0.88	0.93

### Rolling Hour Summary

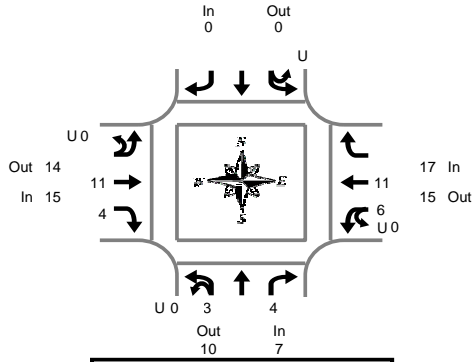
4:00 PM to 6:00 PM

Interval Start Time	Northbound SHAW RD E			Southbound n/a				Eastbound E MAIN AVE			Westbound E MAIN AVE			Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)				
	U	L	T	R	U	L	T	R	U	L	T	R	U		L	T	R	North	South
4:00 PM	0	150		325					0	323	284	0	719	469	2,270	1	0	3	
4:15 PM	0	144		356					0	346	308	0	741	511	2,406	1	0	3	
4:30 PM	0	128		356					0	354	305	0	741	499	2,383	1	0	3	
4:45 PM	0	94		308					0	343	307	0	753	489	2,294	1	0	0	
5:00 PM	0	79		241					0	348	296	0	772	441	2,177	1	0	0	

# Heavy Vehicle Summary



Eric Boivin  
(303) 668-0220



**Peak Hour Summary  
4:15 PM to 5:15 PM**

## SHAW RD E & E MAIN AVE

Thursday, January 29, 2015  
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound SHAW RD E				Southbound n/a				Eastbound E MAIN AVE				Westbound E MAIN AVE				Interval Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total				
4:00 PM	0	0		0	0					0	1	0	1	0	1	1	0	2	3
4:15 PM	0	0		0	0					0	2	1	3	0	2	2		4	7
4:30 PM	0	1		1	2					0	5	3	8	0	1	5		6	16
4:45 PM	0	2		3	5					0	3	0	3	0	2	3		5	13
5:00 PM	0	0		0	0					0	1	0	1	0	1	1		2	3
5:15 PM	0	1		2	3					0	2	0	2	0	0	0		0	5
5:30 PM	0	0		1	1					0	1	1	2	0	0	3		3	6
5:45 PM	0	0		1	1					0	2	0	2	0	2	1		3	6
Total Survey	0	4		8	12					0	0	17	5	22	0	9	16	25	13

Peak Hour Summary  
4:15 PM to 5:15 PM

By Approach	Northbound SHAW RD E			Southbound n/a			Eastbound E MAIN AVE			Westbound E MAIN AVE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	10	17	0	0	0	15	14	29	17	15	32	39

By Movement	Northbound SHAW RD E				Southbound n/a				Eastbound E MAIN AVE				Westbound E MAIN AVE				Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total				
Volume	0	3		4	7					0	0	11	4	15	0	6	11	17	39

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

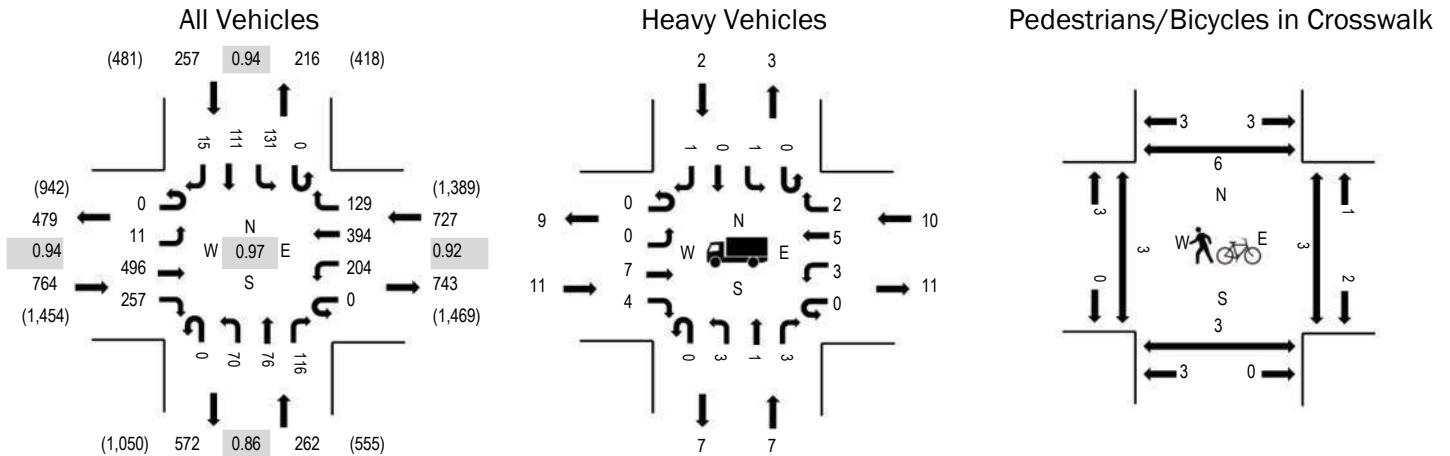
Interval Start Time	Northbound SHAW RD E				Southbound n/a				Eastbound E MAIN AVE				Westbound E MAIN AVE				Interval Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total				
4:00 PM	0	3		4	7					0	11	4	15	0	6	11		17	39
4:15 PM	0	3		4	7					0	11	4	15	0	6	11		17	39
4:30 PM	0	4		6	10					0	11	3	14	0	4	9		13	37
4:45 PM	0	3		6	9					0	7	1	8	0	3	7		10	27
5:00 PM	0	1		4	5					0	6	1	7	0	3	5		8	20



(303) 216-2439  
www.alltrafficdata.net

Location: 1 15TH ST SE & E MAIN PM  
Date and Start Time: Tuesday, November 3, 2015  
Peak Hour: 04:30 PM - 05:30 PM  
Peak 15-Minutes: 04:30 PM - 04:45 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.4%	0.94
WB	1.4%	0.92
NB	2.7%	0.86
SB	0.8%	0.94
All	1.5%	0.97

**Traffic Counts - All Vehicles**

Interval Start Time	E MAIN Eastbound				E MAIN Westbound				15TH ST SE Northbound				ACCESS Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	4	111	47	0	49	116	33	0	13	31	40	0	20	19	5	488	1,981
4:15:00 PM	0	3	116	50	0	49	99	25	0	16	20	32	0	36	24	6	476	2,006
4:30:00 PM	0	3	128	72	0	60	110	26	0	20	14	20	0	33	28	5	519	2,010
4:45:00 PM	0	3	119	52	0	49	97	34	0	20	23	33	0	36	29	3	498	1,977
5:00:00 PM	0	3	115	69	0	51	117	30	0	16	16	39	0	33	22	2	513	1,898
5:15:00 PM	0	2	134	64	0	44	70	39	0	14	23	24	0	29	32	5	480	
5:30:00 PM	0	2	131	62	0	34	94	30	0	17	23	31	0	26	32	4	486	
5:45:00 PM	0	1	115	48	0	34	76	23	0	13	7	50	0	18	30	4	419	
Count Total	0	21	969	464	0	370	779	240	0	129	157	269	0	231	216	34	3,879	
Peak Hour	0	11	496	257	0	204	394	129	0	70	76	116	0	131	111	15	2,010	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

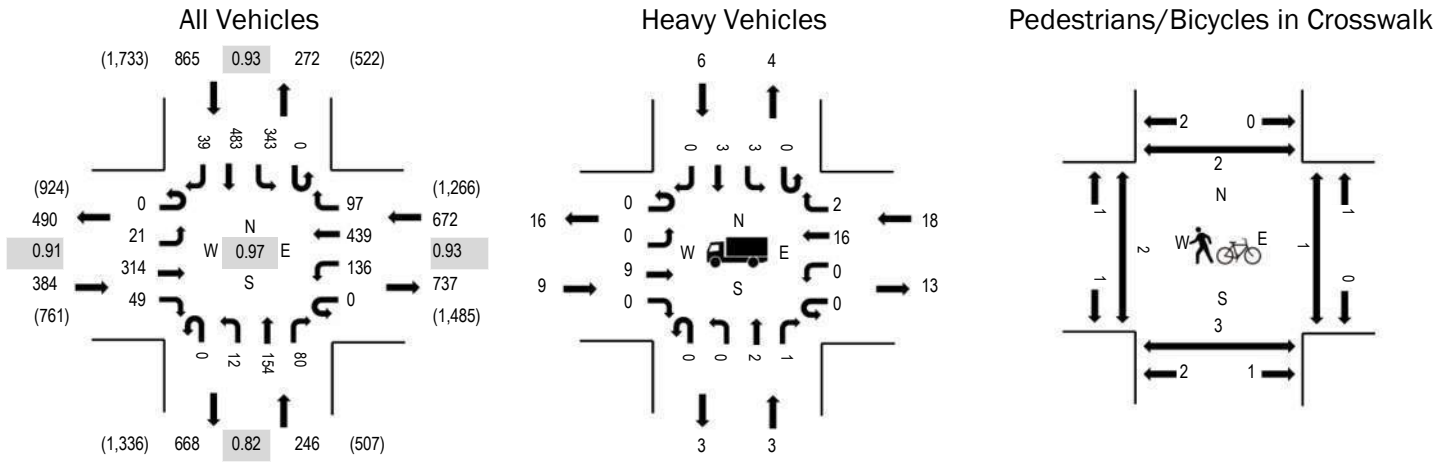
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	2	7	1	1	11	0	1	0	0	1
4:15:00 PM	7	7	0	0	14	0	2	0	0	2
4:30:00 PM	3	1	2	1	7	3	0	2	3	8
4:45:00 PM	1	6	3	1	11	0	0	0	1	1
5:00:00 PM	4	0	2	0	6	0	1	1	2	4
5:15:00 PM	3	3	0	0	6	0	2	0	0	2
5:30:00 PM	4	0	2	0	6	0	2	0	2	4
5:45:00 PM	2	3	1	0	6	0	0	0	2	2
Count Total	26	27	11	3	67	3	8	3	10	24
Peak Hour	11	10	7	2	30	3	3	3	6	15



(303) 216-2439  
www.alltrafficdata.net

Location: 2 5TH ST SE & E MAIN PM  
Date and Start Time: Tuesday, November 3, 2015  
Peak Hour: 04:00 PM - 05:00 PM  
Peak 15-Minutes: 04:00 PM - 04:15 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.3%	0.91
WB	2.7%	0.93
NB	1.2%	0.82
SB	0.7%	0.93
All	1.7%	0.97

**Traffic Counts - All Vehicles**

Interval Start Time	E MAIN Eastbound				E MAIN Westbound				5TH ST SE Northbound				5TH ST SE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	8	81	13	0	33	112	24	0	2	49	24	0	74	121	15	556	2,167
4:15:00 PM	0	4	65	7	0	39	111	31	0	1	35	18	0	92	102	5	510	2,115
4:30:00 PM	0	2	88	10	0	37	109	20	0	5	34	18	0	84	130	10	547	2,132
4:45:00 PM	0	7	80	19	0	27	107	22	0	4	36	20	0	93	130	9	554	2,149
5:00:00 PM	0	5	79	7	0	29	125	22	0	1	37	26	0	66	99	8	504	2,100
5:15:00 PM	0	6	75	6	0	30	80	23	0	5	38	22	0	93	142	7	527	
5:30:00 PM	0	2	75	14	0	29	99	26	0	3	41	27	0	90	151	7	564	
5:45:00 PM	0	3	91	14	0	32	83	16	0	4	31	26	0	78	115	12	505	
Count Total	0	37	634	90	0	256	826	184	0	25	301	181	0	670	990	73	4,267	
Peak Hour	0	21	314	49	0	136	439	97	0	12	154	80	0	343	483	39	2,167	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

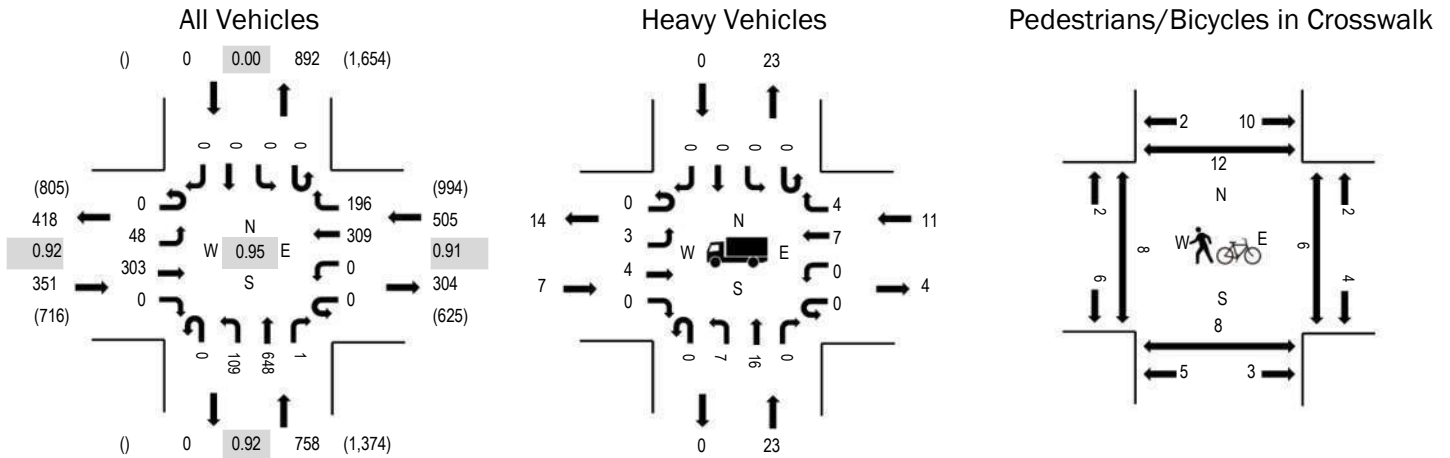
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	3	6	0	4	13	0	1	0	0	1
4:15:00 PM	3	6	1	1	11	1	0	0	0	1
4:30:00 PM	2	4	1	0	7	1	0	0	1	2
4:45:00 PM	1	2	1	1	5	0	0	3	1	4
5:00:00 PM	1	3	1	3	8	3	4	3	0	10
5:15:00 PM	1	0	2	1	4	2	1	1	3	7
5:30:00 PM	2	2	1	2	7	1	0	2	1	4
5:45:00 PM	1	2	0	1	4	2	0	3	2	7
Count Total	14	25	7	13	59	10	6	12	8	36
Peak Hour	9	18	3	6	36	2	1	3	2	8



(303) 216-2439  
www.alltrafficdata.net

Location: 3 2ND ST NE & E MAIN PM  
Date and Start Time: Tuesday, November 3, 2015  
Peak Hour: 04:30 PM - 05:30 PM  
Peak 15-Minutes: 05:00 PM - 05:15 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.0%	0.92
WB	2.2%	0.91
NB	3.0%	0.92
SB		0.00
All	2.5%	0.95

**Traffic Counts - All Vehicles**

Interval Start Time	E STEWART Eastbound				E MAIN Westbound				2ND ST NE Northbound				2ND ST NE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	14	91	0	0	0	82	72	0	23	109	2	0	0	0	0	393	1,564
4:15:00 PM	0	10	66	0	0	0	76	43	0	21	151	0	0	0	0	0	367	1,596
4:30:00 PM	0	11	82	0	0	0	74	50	0	26	160	0	0	0	0	0	403	1,614
4:45:00 PM	0	13	76	0	0	0	88	51	0	20	153	0	0	0	0	0	401	1,588
5:00:00 PM	0	16	79	0	0	0	83	55	0	27	164	1	0	0	0	0	425	1,520
5:15:00 PM	0	8	66	0	0	0	64	40	0	36	171	0	0	0	0	0	385	
5:30:00 PM	0	13	88	0	0	0	75	43	0	17	141	0	0	0	0	0	377	
5:45:00 PM	0	10	73	0	0	0	65	33	0	28	123	1	0	0	0	0	333	
Count Total	0	95	621	0	0	0	607	387	0	198	1,172	4	0	0	0	0	3,084	
Peak Hour	0	48	303	0	0	0	309	196	0	109	648	1	0	0	0	0	1,614	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

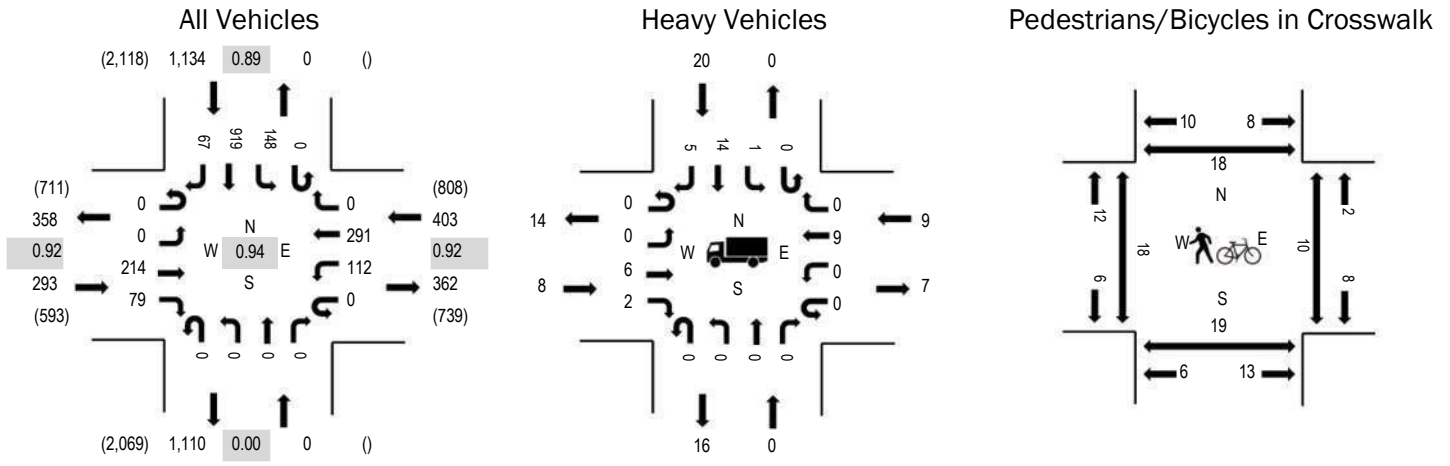
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	3	4	3	0	10	1	1	3	6	11
4:15:00 PM	4	6	1	0	11	1	1	0	3	5
4:30:00 PM	2	4	7	0	13	0	2	1	0	3
4:45:00 PM	1	2	4	0	7	1	2	3	2	8
5:00:00 PM	4	5	3	0	12	7	2	3	4	16
5:15:00 PM	0	0	9	0	9	0	0	1	6	7
5:30:00 PM	3	1	4	0	8	3	1	2	5	11
5:45:00 PM	1	1	7	0	9	3	1	0	7	11
Count Total	18	23	38	0	79	16	10	13	33	72
Peak Hour	7	11	23	0	41	8	6	8	12	34



(303) 216-2439  
www.alltrafficdata.net

Location: 4 N MERIDIAN & E STEWART PM  
Date and Start Time: Tuesday, November 3, 2015  
Peak Hour: 05:00 PM - 06:00 PM  
Peak 15-Minutes: 05:45 PM - 06:00 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.7%	0.92
WB	2.2%	0.92
NB		0.00
SB	1.8%	0.89
All	2.0%	0.94

**Traffic Counts - All Vehicles**

Interval Start Time	W STEWART Eastbound				E STEWART Westbound				N MERIDIAN Northbound				N MERIDIAN Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	0	59	24	0	31	61	0	0	0	0	0	0	44	169	16	404	1,689
4:15:00 PM	0	0	49	16	0	26	83	0	0	0	0	0	0	31	188	9	402	1,718
4:30:00 PM	0	0	55	12	0	28	64	0	0	0	0	0	0	40	196	14	409	1,789
4:45:00 PM	0	0	61	24	0	27	85	0	0	0	0	0	0	38	218	21	474	1,819
5:00:00 PM	0	0	46	27	0	23	86	0	0	0	0	0	0	40	192	19	433	1,830
5:15:00 PM	0	0	60	17	0	33	67	0	0	0	0	0	0	33	246	17	473	
5:30:00 PM	0	0	59	21	0	23	66	0	0	0	0	0	0	39	214	17	439	
5:45:00 PM	0	0	49	14	0	33	72	0	0	0	0	0	0	36	267	14	485	
Count Total	0	0	438	155	0	224	584	0	0	0	0	0	0	301	1,690	127	3,519	
Peak Hour	0	0	214	79	0	112	291	0	0	0	0	0	0	148	919	67	1,830	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

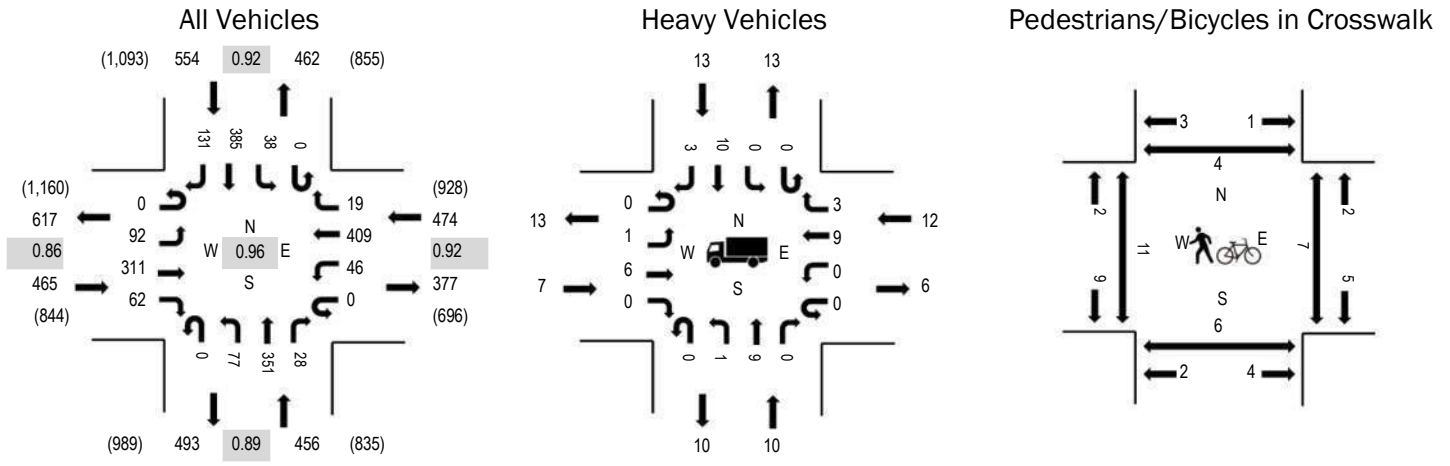
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	6	2	0	4	12	11	16	9	1	37
4:15:00 PM	3	3	0	6	12	3	2	1	6	12
4:30:00 PM	4	4	0	1	9	2	13	7	2	24
4:45:00 PM	2	2	0	4	8	9	6	10	1	26
5:00:00 PM	4	5	0	6	15	2	5	2	1	10
5:15:00 PM	0	2	0	5	7	2	3	9	6	20
5:30:00 PM	3	1	0	5	9	5	1	2	5	13
5:45:00 PM	1	1	0	4	6	9	1	6	6	22
Count Total	23	20	0	35	78	43	47	46	28	164
Peak Hour	8	9	0	20	37	18	10	19	18	65



(303) 216-2439  
www.alltrafficdata.net

Location: 7 5TH ST SW & W PIONEER PM  
Date and Start Time: Tuesday, November 3, 2015  
Peak Hour: 04:45 PM - 05:45 PM  
Peak 15-Minutes: 05:15 PM - 05:30 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.5%	0.86
WB	2.5%	0.92
NB	2.2%	0.89
SB	2.3%	0.92
All	2.2%	0.96

**Traffic Counts - All Vehicles**

Interval Start Time	W PIONEER Eastbound				W PIONEER Westbound				5TH ST SW Northbound				5TH ST SW Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	10	70	7	0	18	82	9	0	20	80	4	0	11	123	25	459	1,814
4:15:00 PM	0	17	65	13	0	11	86	6	0	23	70	4	0	12	84	15	406	1,845
4:30:00 PM	0	20	68	11	0	13	111	11	0	13	83	4	0	8	92	36	470	1,947
4:45:00 PM	0	31	77	15	0	6	94	9	0	17	103	8	0	9	87	23	479	1,949
5:00:00 PM	0	17	72	10	0	11	114	4	0	21	83	7	0	7	104	40	490	1,886
5:15:00 PM	0	25	88	22	0	17	107	1	0	21	82	8	0	8	92	37	508	
5:30:00 PM	0	19	74	15	0	12	94	5	0	18	83	5	0	14	102	31	472	
5:45:00 PM	0	19	62	17	0	15	85	7	0	14	61	3	0	8	92	33	416	
Count Total	0	158	576	110	0	103	773	52	0	147	645	43	0	77	776	240	3,700	
Peak Hour	0	92	311	62	0	46	409	19	0	77	351	28	0	38	385	131	1,949	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

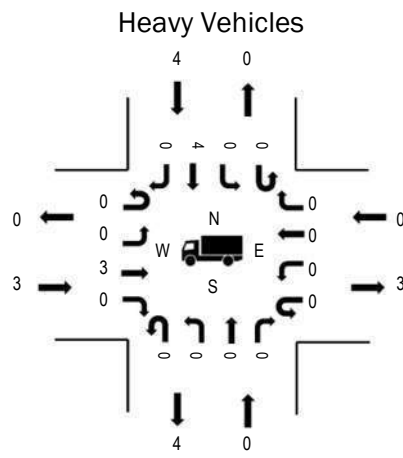
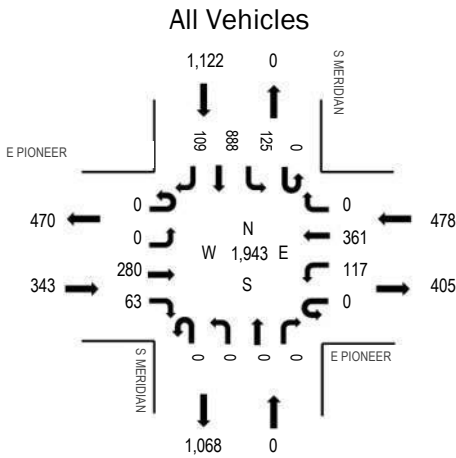
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	2	6	5	5	18	0	2	0	1	3
4:15:00 PM	4	5	4	6	19	0	0	0	1	1
4:30:00 PM	4	1	1	5	11	0	0	0	0	0
4:45:00 PM	3	2	2	2	9	0	1	0	0	1
5:00:00 PM	0	4	2	4	10	4	1	5	0	10
5:15:00 PM	2	3	2	2	9	4	5	1	1	11
5:30:00 PM	2	3	4	5	14	3	0	0	3	6
5:45:00 PM	0	0	0	1	1	0	0	0	2	2
Count Total	17	24	20	30	91	11	9	6	8	34
Peak Hour	7	12	10	13	42	11	7	6	4	28



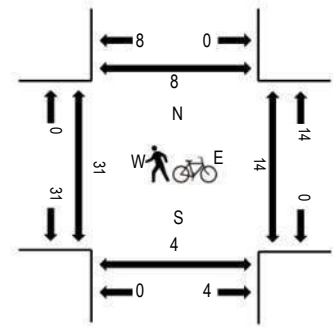
Location: 1 S MERIDIAN & E PIONEER PM  
 Date and Start Time: Wednesday, January 6, 2016  
 Peak Hour: 04:15 PM - 05:15 PM

(303) 216-2439  
 www.alltrafficdata.net

**Peak Hour**



**Pedestrians/Bicycles in Crosswalk**



	HV%	PHF
EB	0.9%	0.89
WB	0.0%	0.94
NB		0.00
SB	0.4%	0.94
All	0.4%	0.94

**Traffic Counts - All Vehicles**

Interval Start Time	E PIONEER Eastbound				E PIONEER Westbound				S MERIDIAN Northbound				S MERIDIAN Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	0	65	9	0	24	74	0	0	0	0	0	0	36	240	30	478	1,902
4:15:00 PM	0	0	77	16	0	19	83	0	0	0	0	0	0	35	188	23	441	1,943
4:30:00 PM	0	0	59	14	0	38	84	0	0	0	0	0	0	32	221	30	478	1,943
4:45:00 PM	0	0	65	16	0	29	98	0	0	0	0	0	0	27	237	33	505	1,905
5:00:00 PM	0	0	79	17	0	31	96	0	0	0	0	0	0	31	242	23	519	1,854
5:15:00 PM	0	0	62	15	0	28	70	0	0	0	0	0	0	28	219	19	441	
5:30:00 PM	0	0	61	9	0	27	81	0	0	0	0	0	0	25	214	23	440	
5:45:00 PM	0	0	50	21	0	24	75	0	0	0	0	0	0	26	230	28	454	
Count Total	0	0	518	117	0	220	661	0	0	0	0	0	0	240	1,791	209	3,756	
Peak Hour	0	0	280	63	0	117	361	0	0	0	0	0	0	125	888	109	1,943	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	0	0	0	0	0	5	5	0	4	14
4:15:00 PM	0	0	0	0	0	3	7	0	1	11
4:30:00 PM	2	0	0	3	5	8	1	0	0	9
4:45:00 PM	1	0	0	0	1	10	3	2	4	19
5:00:00 PM	0	0	0	1	1	10	3	2	3	18
5:15:00 PM	1	0	0	0	1	5	4	3	3	15
5:30:00 PM	1	1	0	1	3	6	12	1	8	27
5:45:00 PM	0	0	0	0	0	3	4	1	0	8
Count Total	5	1	0	5	11	50	39	9	23	121
Peak Hour	3	0	0	4	7	31	14	4	8	57

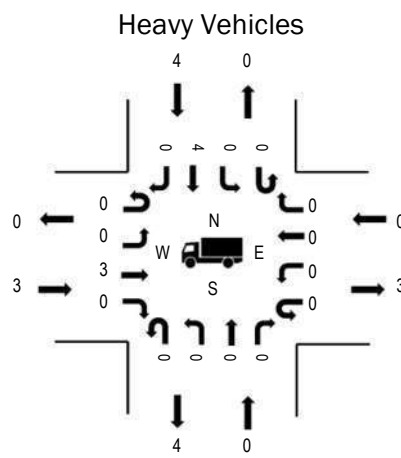
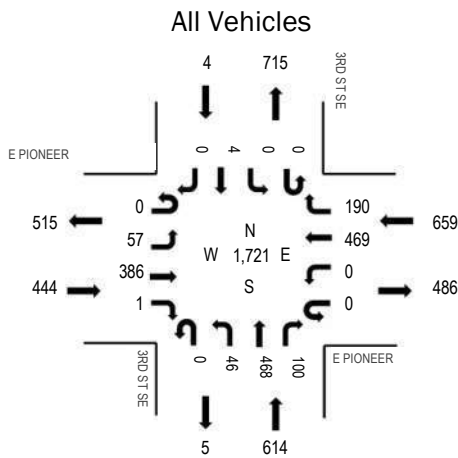




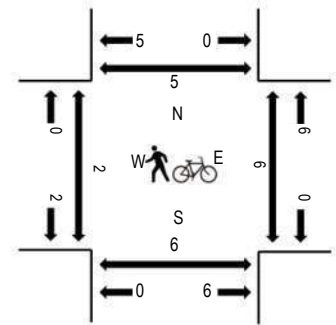
(303) 216-2439  
www.alltrafficdata.net

Location: 2 3RD ST SE & E PIONEER PM  
Date and Start Time: Wednesday, January 6, 2016  
Peak Hour: 04:15 PM - 05:15 PM

**Peak Hour**



**Pedestrians/Bicycles in Crosswalk**



	HV%	PHF
EB	0.7%	0.90
WB	0.0%	0.89
NB	0.0%	0.90
SB	100.0%	0.33
All	0.4%	0.97

**Traffic Counts - All Vehicles**

Interval Start Time	E PIONEER Eastbound				E PIONEER Westbound				3RD ST SE Northbound				3RD ST SE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	14	89	0	0	0	65	44	0	13	120	24	0	0	0	0	369	1,652
4:15:00 PM	0	12	111	0	0	0	110	40	0	9	101	17	0	0	0	0	400	1,721
4:30:00 PM	0	12	89	0	0	0	116	50	0	16	130	25	0	0	3	0	441	1,719
4:45:00 PM	0	15	90	1	0	0	133	52	0	10	114	27	0	0	0	0	442	1,651
5:00:00 PM	0	18	96	0	0	0	110	48	0	11	123	31	0	0	1	0	438	1,524
5:15:00 PM	0	16	86	0	0	0	91	36	0	9	136	24	0	0	0	0	398	
5:30:00 PM	0	9	83	0	0	0	100	33	0	12	113	22	0	0	1	0	373	
5:45:00 PM	0	8	71	0	0	0	98	24	0	4	91	19	0	0	0	0	315	
Count Total	0	104	715	1	0	0	823	327	0	84	928	189	0	0	5	0	3,176	
Peak Hour	0	57	386	1	0	0	469	190	0	46	468	100	0	0	4	0	1,721	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	0	0	0	0	0	2	6	0	3	11
4:15:00 PM	0	0	0	0	0	1	1	0	1	3
4:30:00 PM	2	0	0	3	5	1	3	0	1	5
4:45:00 PM	1	0	0	0	1	0	1	1	0	2
5:00:00 PM	0	0	0	1	1	0	1	5	3	9
5:15:00 PM	1	0	0	0	1	3	1	1	2	7
5:30:00 PM	1	1	0	1	3	0	2	4	2	8
5:45:00 PM	0	0	0	0	0	1	0	3	1	5
Count Total	5	1	0	5	11	8	15	14	13	50
Peak Hour	3	0	0	4	7	2	6	6	5	19

**Peak Hour Summary**

Site ID: 8



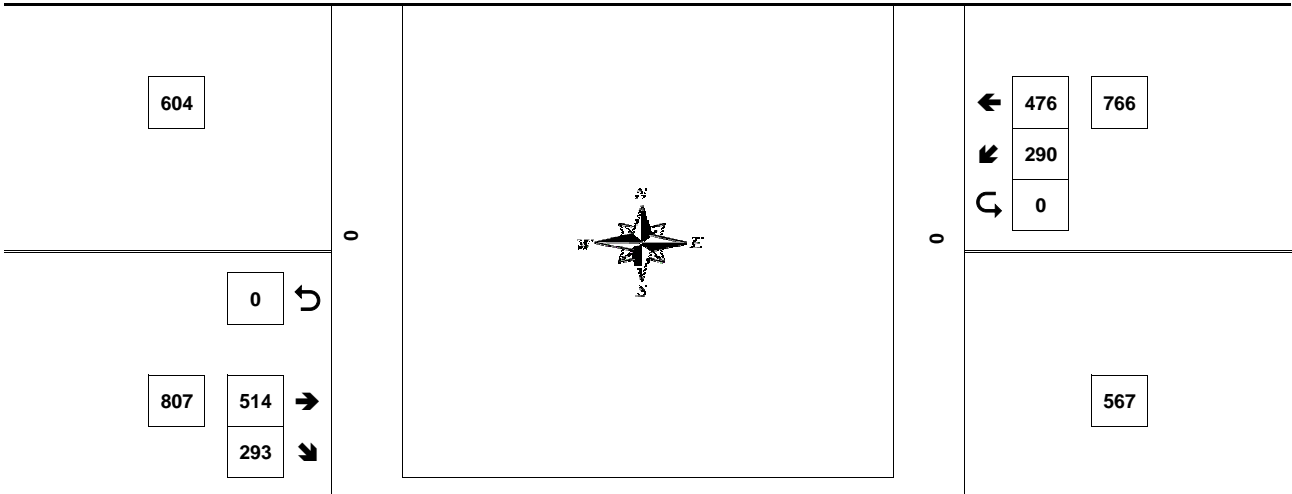
Eric Boivin  
(303) 668-0220

**SR 512 WB RAMPS & E PIONEER AVE**

4:30 PM to 5:30 PM  
Thursday, January 29, 2015

**E PIONEER AVE**

0



**E PIONEER AVE**

**SR 512 WB  
RAMPS**

Approach	PHF	HV%	Volume
EB	0.96	0.7%	807
WB	0.92	1.0%	766
NB	0.87	2.2%	181
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.96</b>	<b>1.0%</b>	<b>1,754</b>

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

# Total Vehicle Summary



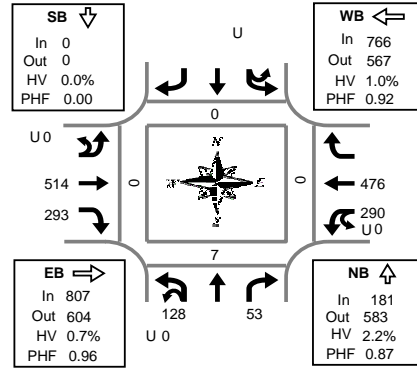
Eric Boivin  
(303) 668-0220

Site ID: 8

## SR 512 WB RAMPS & E PIONEER AVE

Thursday, January 29, 2015

4:00 PM to 6:00 PM



**Peak Hour Summary**  
4:30 PM to 5:30 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound SR 512 WB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		South	East	West	
4:00 PM	0	31		15					0	124	62	0	50	123			3	0	0		
4:15 PM	0	35		12					0	114	74	0	59	121			0	0	0		
4:30 PM	0	31		12					0	118	69	0	82	108			2	0	0		
4:45 PM	0	21		16					0	130	80	0	53	125			2	0	0		
5:00 PM	0	39		10					0	119	81	0	93	116			2	0	0		
5:15 PM	0	37		15					0	147	63	0	62	127			1	0	0		
5:30 PM	0	23		12					0	118	66	0	73	98			0	0	0		
5:45 PM	0	27		21					0	107	68	0	102	114			2	0	0		
Total Survey	0	244		113					0	977	563	0	574	932			12	0	0		

### Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound SR 512 WB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV		North	South	East	West
Volume	181	583	764	4	0	0	0	0	807	604	1,411	6	766	567	1,333	8	0	7	0	0	
%HV		2.2%				0.0%				0.7%				1.0%							
PHF		0.87				0.00				0.96				0.92							

By Movement	Northbound SR 512 WB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Volume	0	128		53					0	514	293	0	290	476			1,754
%HV	0.0%	1.6%		3.8%					0.0%	0.8%	0.7%	0.0%	1.0%	1.1%			1.0%
PHF	0.00	0.82		0.83					0.00	0.87	0.90	0.00	0.78	0.94			0.96

### Rolling Hour Summary

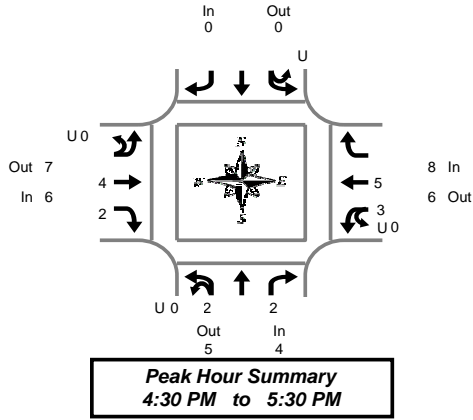
4:00 PM to 6:00 PM

Interval Start Time	Northbound SR 512 WB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	0	118		55					0	486	285	0	244	477			1,665	7	0	0	
4:15 PM	0	126		50					0	481	304	0	287	470			1,718	6	0	0	
4:30 PM	0	128		53					0	514	293	0	290	476			1,754	7	0	0	
4:45 PM	0	120		53					0	514	290	0	281	466			1,724	5	0	0	
5:00 PM	0	126		58					0	491	278	0	330	455			1,738	5	0	0	

# Heavy Vehicle Summary



Eric Boivin  
(303) 668-0220



## SR 512 WB RAMPS & E PIONEER AVE

Thursday, January 29, 2015

4:00 PM to 6:00 PM

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

Interval Start Time	Northbound SR 512 WB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total				
4:00 PM	0	0		0	0						0	0	1	1	0	0	1	1	2
4:15 PM	0	2		0	2						0		1	0	1	0	2	3	5
4:30 PM	0	0		0	0						0		1	0	1	0	1	0	1
4:45 PM	0	0		1	1						0		0	2	2	0	0	2	2
5:00 PM	0	0		1	1						0		1	0	1	0	2	2	4
5:15 PM	0	2		0	2						0		2	0	2	0	0	1	1
5:30 PM	0	0		1	1						0		1	0	1	0	0	0	0
5:45 PM	0	0		0	0						0		1	0	1	0	1	1	2
Total Survey	0	4		3	7					0	0		7	3	10	0	6	10	16

Peak Hour Summary  
4:30 PM to 5:30 PM

By Approach	Northbound SR 512 WB RAMPS			Southbound n/a			Eastbound E PIONEER AVE			Westbound E PIONEER AVE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	4	5	9	0	0	0	6	7	13	8	6	14	18

By Movement	Northbound SR 512 WB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total				
Volume	0	2		2	4					0	0		4	2	6	0	3	5	8

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

Interval Start Time	Northbound SR 512 WB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total				
4:00 PM	0	2		1	3						0		2	3	5	0	3	6	9
4:15 PM	0	2		2	4						0		3	2	5	0	5	7	12
4:30 PM	0	2		2	4						0		4	2	6	0	3	5	8
4:45 PM	0	2		3	5						0		4	2	6	0	2	5	7
5:00 PM	0	2		2	4						0		5	0	5	0	3	4	7

Peak Hour Summary

Site ID: 7



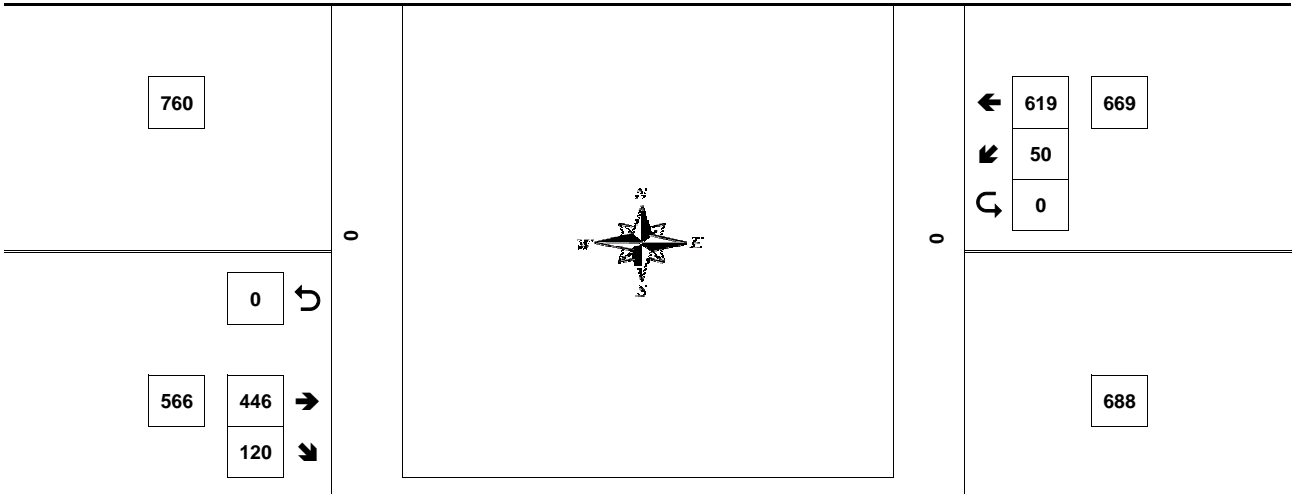
Eric Boivin  
(303) 668-0220

SR 512 EB RAMPS & E PIONEER AVE

4:30 PM to 5:30 PM  
Thursday, January 29, 2015

E PIONEER AVE

0



E PIONEER AVE

SR 512 EB  
RAMPS

Approach	PHF	HV%	Volume
EB	0.86	1.6%	566
WB	0.91	0.6%	669
NB	0.85	2.3%	383
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.93</b>	<b>1.4%</b>	<b>1,618</b>

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

# Total Vehicle Summary



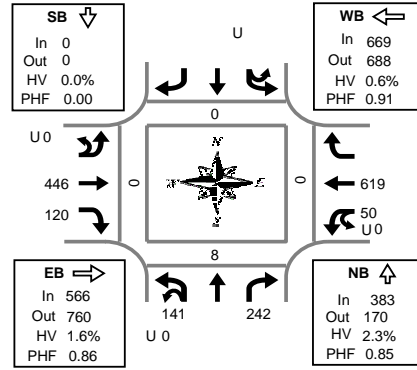
Eric Boivin  
(303) 668-0220

Site ID: 7

## SR 512 EB RAMPS & E PIONEER AVE

Thursday, January 29, 2015

4:00 PM to 6:00 PM



**Peak Hour Summary**  
4:30 PM to 5:30 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound SR 512 EB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		South	East	West	
4:00 PM	0	39		52					0		100	34	0	10	131			5	0	0	
4:15 PM	1	37		64					0		100	29	0	14	150			1	0	0	
4:30 PM	0	34		57					0		107	24	0	15	163			4	0	0	
4:45 PM	0	33		57					0		120	26	0	11	136			2	0	0	
5:00 PM	0	30		60					0		100	25	0	8	175			0	0	0	
5:15 PM	0	44		68					0		119	45	0	16	145			2	0	0	
5:30 PM	0	36		54					0		93	40	0	7	130			1	0	0	
5:45 PM	0	25		67					0		103	27	0	7	192			1	0	0	
Total Survey	1	278		479					0		842	250	0	88	1,222			16	0	0	

### Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound SR 512 EB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV		North	South	East	West
Volume	383	170	553	9	0	0	0	0	566	760	1,326	9	669	688	1,357	4	0	8	0	0	
%HV	2.3%				0.0%				1.6%				0.6%				1.4%				
PHF	0.85				0.00				0.86				0.91				0.93				

By Movement	Northbound SR 512 EB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R				
Volume	0	141		242					0		446	120	0	50	619					1,618
%HV	0.0%	1.4%		2.9%					0.0%		2.0%	0.0%	0.0%	0.0%	0.6%					1.4%
PHF	0.00	0.80		0.89					0.00		0.93	0.67	0.00	0.78	0.88					0.93

### Rolling Hour Summary

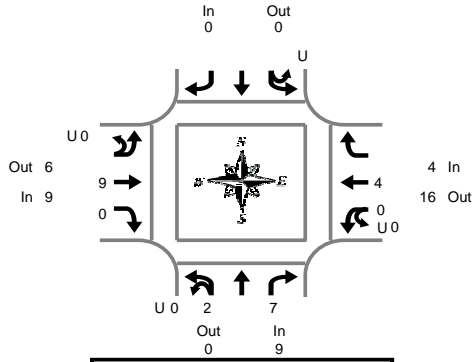
4:00 PM to 6:00 PM

Interval Start Time	Northbound SR 512 EB RAMPS				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	1	143		230					0		427	113	0	50	580			12	0	0	
4:15 PM	1	134		238					0		427	104	0	48	624			7	0	0	
4:30 PM	0	141		242					0		446	120	0	50	619			8	0	0	
4:45 PM	0	143		239					0		432	136	0	42	586			5	0	0	
5:00 PM	0	135		249					0		415	137	0	38	642			4	0	0	

# Heavy Vehicle Summary



Eric Boivin  
(303) 668-0220



**Peak Hour Summary  
4:30 PM to 5:30 PM**

## SR 512 EB RAMPS & E PIONEER AVE

Thursday, January 29, 2015

4:00 PM to 6:00 PM

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

Interval Start Time	Northbound SR 512 EB RAMPS					Southbound n/a					Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T		R	Total
4:00 PM	0	2		3	5						0		1	0	1	0	0	0		0	6
4:15 PM	0	1		1	2						0		0	1	1	0	0	4		4	7
4:30 PM	0	0		4	4						0		2	0	2	0	0	1		1	7
4:45 PM	0	1		2	3						0		1	0	1	0	0	1		1	5
5:00 PM	0	1		0	1						0		4	0	4	0	0	2		2	7
5:15 PM	0	0		1	1						0		2	0	2	0	0	0		0	3
5:30 PM	0	0		1	1						0		1	1	2	0	0	0		0	3
5:45 PM	0	0		1	1						0		1	0	1	0	1	0		1	3
Total Survey	0	5		13	18					0	0		12	2	14	0	1	8		9	15

Peak Hour Summary  
4:30 PM to 5:30 PM

By Approach	Northbound SR 512 EB RAMPS			Southbound n/a			Eastbound E PIONEER AVE			Westbound E PIONEER AVE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	9	0	9	0	0	0	9	6	15	4	16	20	22

By Movement	Northbound SR 512 EB RAMPS					Southbound n/a					Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T		R	Total
Volume	0	2		7	9					0	0		9	0	9	0	0	4		4	22

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

Interval Start Time	Northbound SR 512 EB RAMPS					Southbound n/a					Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T		R	Total
4:00 PM	0	4		10	14						0		4	1	5	0	0	6		6	25
4:15 PM	0	3		7	10						0		7	1	8	0	0	8		8	26
4:30 PM	0	2		7	9						0		9	0	9	0	0	4		4	22
4:45 PM	0	2		4	6						0		8	1	9	0	0	3		3	18
5:00 PM	0	1		3	4						0		8	1	9	0	1	2		3	16

**Peak Hour Summary**

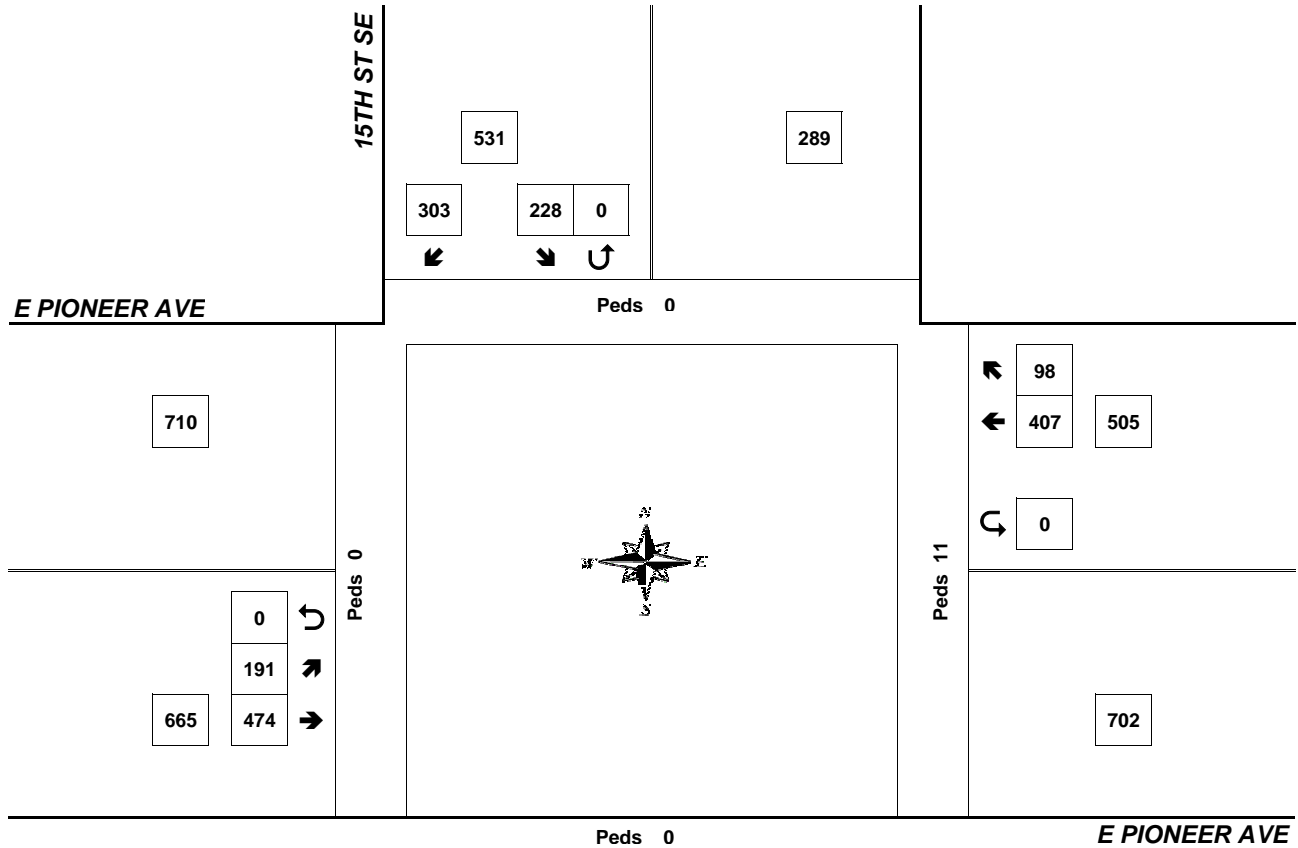
Site ID: 5



Eric Boivin  
(303) 668-0220

**15TH ST SE & E PIONEER AVE**

4:30 PM to 5:30 PM  
Thursday, January 29, 2015



Approach	PHF	HV%	Volume
EB	0.93	1.8%	665
WB	0.84	1.2%	505
NB	0.00	0.0%	0
SB	0.82	0.6%	531
<b>Intersection</b>	<b>0.98</b>	<b>1.2%</b>	<b>1,701</b>

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



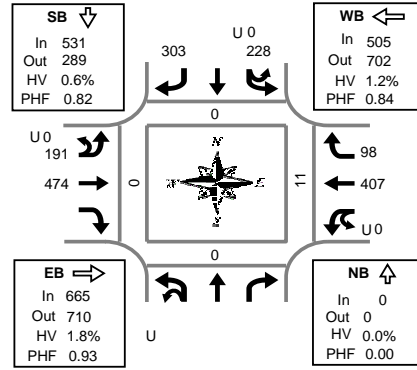
# Total Vehicle Summary



Eric Boivin  
(303) 668-0220

## Site ID: 5 15TH ST SE & E PIONEER AVE

Thursday, January 29, 2015  
4:00 PM to 6:00 PM



### Peak Hour Summary 4:30 PM to 5:30 PM

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

Interval Start Time	Northbound n/a				Southbound 15TH ST SE				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	East	West	
4:00 PM	0	52	71	0	51	107	0	0	84	10	375	0	0	1	0						
4:15 PM	0	45	69	0	40	102	0	0	100	19	375	0	0	0	0						
4:30 PM	0	56	99	0	52	113	0	0	88	20	428	0	0	5	0						
4:45 PM	0	50	58	0	51	128	0	0	101	25	413	0	0	3	0						
5:00 PM	0	68	93	0	41	104	0	0	99	21	426	0	0	1	0						
5:15 PM	0	54	53	0	47	129	0	0	119	32	434	0	0	2	0						
5:30 PM	0	80	52	0	36	105	0	0	106	18	397	1	0	4	0						
5:45 PM	0	57	70	0	41	106	0	0	140	17	431	0	0	2	0						
Total Survey	0	462	565	0	359	894	0	0	837	162	3,279	1	0	18	0						

### Peak Hour Summary 4:30 PM to 5:30 PM

By Approach	Northbound n/a				Southbound 15TH ST SE				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV		North	South	East	West
Volume	0	0	0	0	531	289	820	3	665	710	1,375	12	505	702	1,207	6	1,701	0	0	11	0
%HV			0.0%			0.6%				1.8%				1.2%			1.2%				
PHF			0.00			0.82				0.93				0.84			0.98				

By Movement	Northbound n/a				Southbound 15TH ST SE				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R				
Volume	0	228	303	0	191	474	0	0	407	98	1,701	0	0	0	0	1,701	0	0	0	0
%HV		0.0%	0.9%	0.3%	0.0%	1.6%	1.9%	0.0%	0.0%	1.2%	1.0%	0.0%	0.0%	0.0%	0.0%	1.2%	1.0%	0.0%	0.0%	0.0%
PHF		0.00	0.84	0.77	0.00	0.92	0.92	0.00	0.00	0.86	0.77	0.00	0.00	0.00	0.00	0.98	0.77	0.00	0.00	0.00

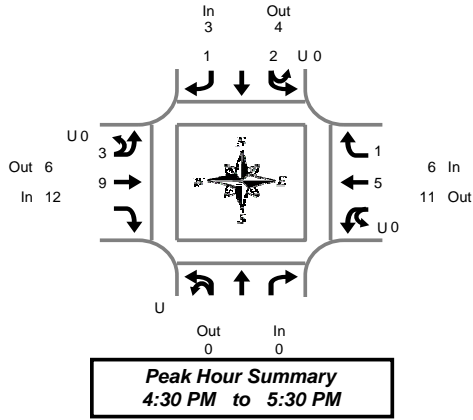
### Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound n/a				Southbound 15TH ST SE				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	0	203	297	0	194	450	0	0	373	74	1,591	0	0	9	0						
4:15 PM	0	219	319	0	184	447	0	0	388	85	1,642	0	0	9	0						
4:30 PM	0	228	303	0	191	474	0	0	407	98	1,701	0	0	11	0						
4:45 PM	0	252	256	0	175	466	0	0	425	96	1,670	1	0	10	0						
5:00 PM	0	259	268	0	165	444	0	0	464	88	1,688	1	0	9	0						

# Heavy Vehicle Summary



Eric Boivin  
(303) 668-0220



## 15TH ST SE & E PIONEER AVE

Thursday, January 29, 2015

4:00 PM to 6:00 PM

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

Interval Start Time	Northbound n/a					Southbound 15TH ST SE					Eastbound E PIONEER AVE					Westbound E PIONEER AVE					Interval Total	
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total		
4:00 PM						0	0		1	1	0	2	3		5	0			0	0	0	6
4:15 PM						0	0		0	0	0	0	1		1	0			2	1	3	4
4:30 PM						0	0		0	0	0	1	2		3	0			1	1	2	5
4:45 PM						0	1		0	1	0	2	3		5	0			1	0	1	7
5:00 PM						0	1		0	1	0	0	0		0	0			3	0	3	4
5:15 PM						0	0		1	1	0	0	4		4	0			0	0	0	5
5:30 PM						0	0		0	0	0	1	0		1	0			0	0	0	1
5:45 PM						0	1		1	2	0	0	3		3	0			2	0	2	7
Total Survey						0	0		3	6	0	6	16		22	0			9	2	11	5

Peak Hour Summary  
4:30 PM to 5:30 PM

By Approach	Northbound n/a			Southbound 15TH ST SE			Eastbound E PIONEER AVE			Westbound E PIONEER AVE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	3	4	7	12	6	18	6	11	17	21

By Movement	Northbound n/a					Southbound 15TH ST SE					Eastbound E PIONEER AVE					Westbound E PIONEER AVE					Total	
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total		
Volume					0	0	2		1	3	0	3	9		12	0			5	1	6	21

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

Interval Start Time	Northbound n/a					Southbound 15TH ST SE					Eastbound E PIONEER AVE					Westbound E PIONEER AVE					Interval Total	
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total		
4:00 PM						0	1		1	2	0	5	9		14	0			4	2	6	22
4:15 PM						0	2		0	2	0	3	6		9	0			7	2	9	20
4:30 PM						0	2		1	3	0	3	9		12	0			5	1	6	21
4:45 PM						0	2		1	3	0	3	7		10	0			4	0	4	17
5:00 PM						0	2		2	4	0	1	7		8	0			5	0	5	17

**Peak Hour Summary**

Site ID: 3



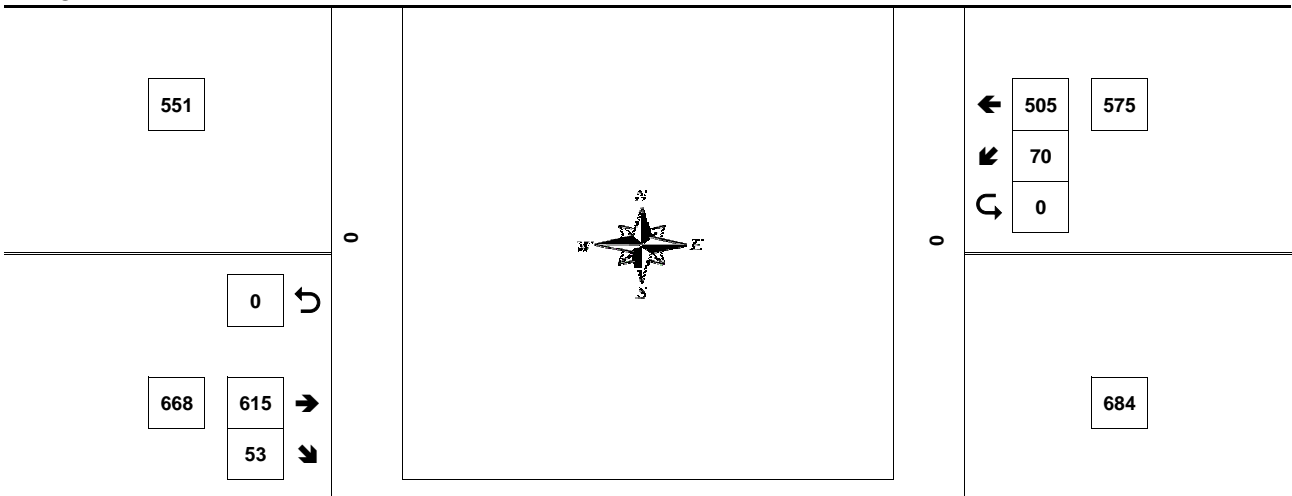
Eric Boivin  
(303) 668-0220

**21ST ST SE & E PIONEER AVE**

5:00 PM to 6:00 PM  
Thursday, January 29, 2015

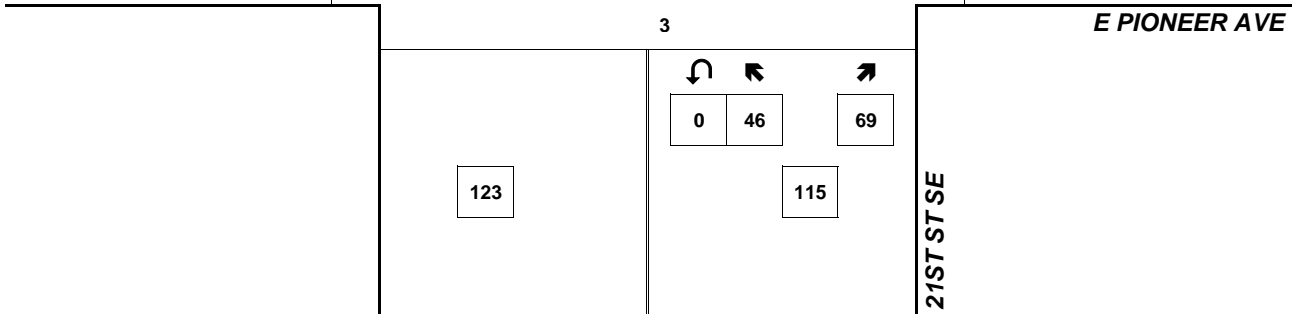
**E PIONEER AVE**

0



3

**E PIONEER AVE**



Approach	PHF	HV%	Volume
EB	0.93	1.3%	668
WB	0.86	0.5%	575
NB	0.64	0.0%	115
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.96</b>	<b>0.9%</b>	<b>1,358</b>

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

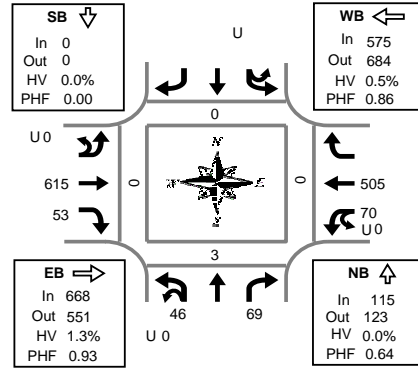
# Total Vehicle Summary



Eric Boivin  
(303) 668-0220

## Site ID: 3 21ST ST SE & E PIONEER AVE

Thursday, January 29, 2015  
4:00 PM to 6:00 PM



### Peak Hour Summary 5:00 PM to 6:00 PM

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

Interval Start Time	Northbound 21ST ST SE				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		South	East	West	
4:00 PM	0	9		30					0	139	12	0	23	96					1	0	0
4:15 PM	0	10		22					0	122	12	0	20	101					1	0	0
4:30 PM	0	11		24					0	156	12	0	26	102					3	0	0
4:45 PM	0	15		28					0	135	16	0	11	105					0	0	0
5:00 PM	0	17		28					0	157	14	0	14	118					1	0	0
5:15 PM	0	17		19					0	168	11	0	19	121					0	0	0
5:30 PM	0	8		13					0	151	16	0	17	118					2	0	0
5:45 PM	0	4		9					0	139	12	0	20	148					0	0	0
Total Survey	0	91		173					0	1,167	105	0	150	909					8	0	0

### Peak Hour Summary 5:00 PM to 6:00 PM

By Approach	Northbound 21ST ST SE				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV		North	South	East	West
Volume	115	123	238	0	0	0	0	0	668	551	1,219	9	575	684	1,259	3	0	0	0	0	
%HV		0.0%				0.0%				1.3%				0.5%							
PHF		0.64				0.00				0.93				0.86							

By Movement	Northbound 21ST ST SE				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total		
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R			
Volume	0	46		69					0	615	53	0	70	505					1,358
%HV	0.0%	0.0%		0.0%					0.0%	1.1%	3.8%	0.0%	0.0%	0.6%					0.9%
PHF	0.00	0.68		0.62					0.00	0.92	0.83	0.00	0.88	0.85					0.96

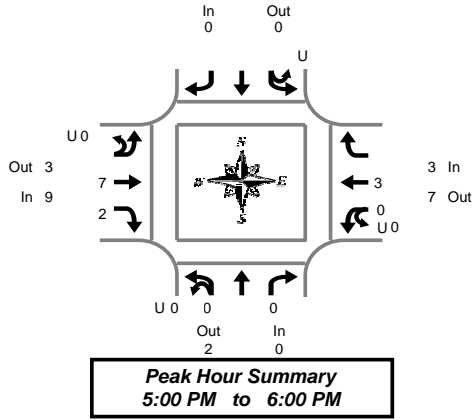
### Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound 21ST ST SE				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	0	45		104					0	552	52	0	80	404					5	0	0
4:15 PM	0	53		102					0	570	54	0	71	426					5	0	0
4:30 PM	0	60		99					0	616	53	0	70	446					4	0	0
4:45 PM	0	57		88					0	611	57	0	61	462					3	0	0
5:00 PM	0	46		69					0	615	53	0	70	505					3	0	0

# Heavy Vehicle Summary



Eric Boivin  
(303) 668-0220



## 21ST ST SE & E PIONEER AVE

Thursday, January 29, 2015  
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound 21ST ST SE				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total				
4:00 PM	0	0		1	1					0	3	0	3	0	0	0	0	4	
4:15 PM	0	0		1	1					0	1	0	1	0	0	3		5	
4:30 PM	0	0		0	0					0	2	0	2	0	1	2		5	
4:45 PM	0	0		1	1					0	3	0	3	0	0	0		4	
5:00 PM	0	0		0	0					0	1	0	1	0	0	1		2	
5:15 PM	0	0		0	0					0	4	0	4	0	0	0		4	
5:30 PM	0	0		0	0					0	0	1	1	0	0	0		1	
5:45 PM	0	0		0	0					0	2	1	3	0	0	2		5	
Total Survey	0	0		3	3					0	0	16	2	18	0	1	8	9	5

### Peak Hour Summary 5:00 PM to 6:00 PM

By Approach	Northbound 21ST ST SE			Southbound n/a			Eastbound E PIONEER AVE			Westbound E PIONEER AVE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	2	2	0	0	0	9	3	12	3	7	10	12

By Movement	Northbound 21ST ST SE				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total				
Volume	0	0		0	0					0	0	7	2	9	0	0	3	3	12

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

Interval Start Time	Northbound 21ST ST SE				Southbound n/a				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total		
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total				
4:00 PM	0	0		3	3					0	9	0	9	0	1	5		6	18
4:15 PM	0	0		2	2					0	7	0	7	0	1	6		7	16
4:30 PM	0	0		1	1					0	10	0	10	0	1	3		4	15
4:45 PM	0	0		1	1					0	8	1	9	0	0	1		1	11
5:00 PM	0	0		0	0					0	7	2	9	0	0	3		3	12

**Peak Hour Summary**

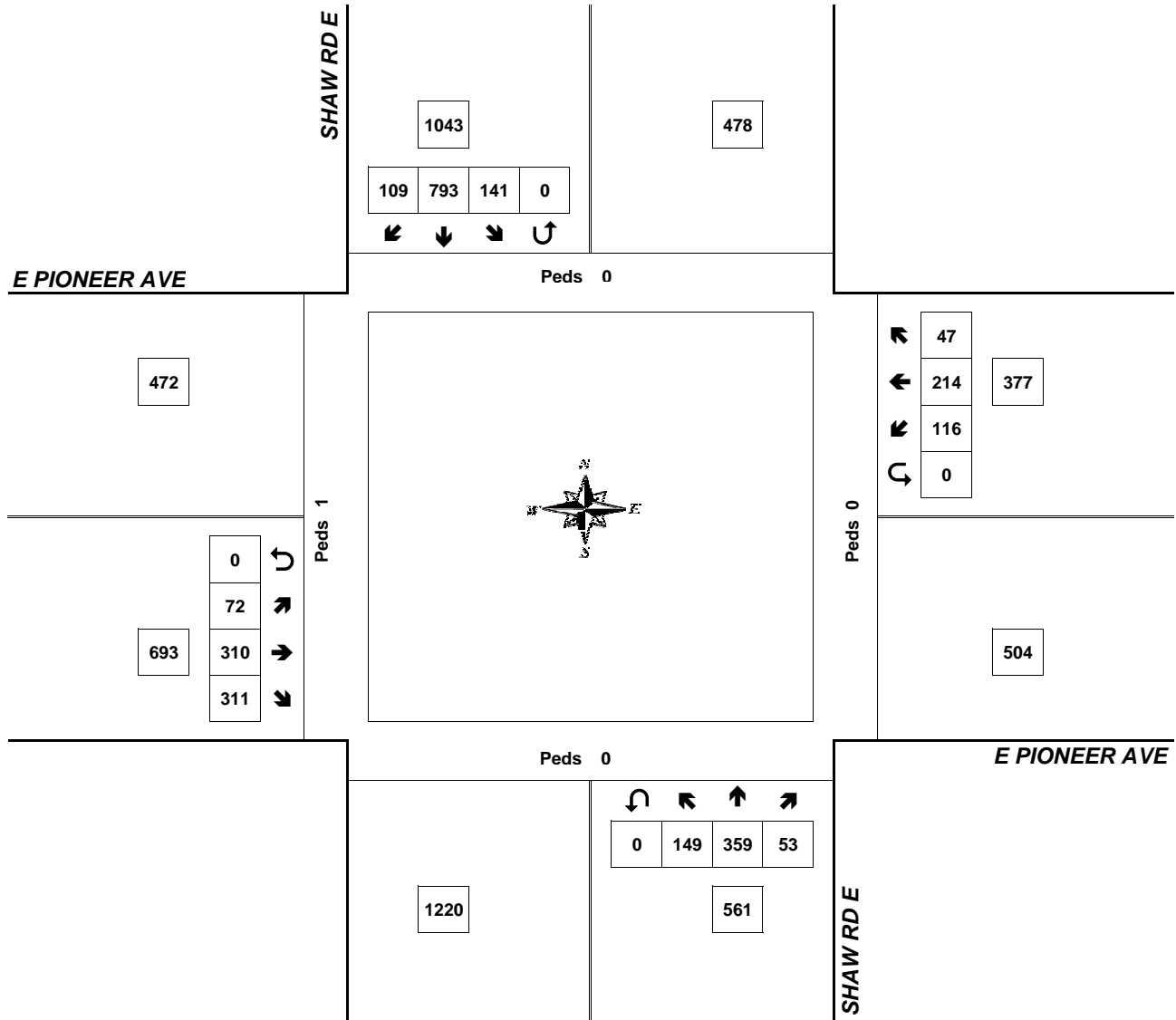
Site ID: 1



Eric Boivin  
(303) 668-0220

**SHAW RD E & E PIONEER AVE**

4:30 PM to 5:30 PM  
Tuesday, February 03, 2015



Approach	PHF	HV%	Volume
EB	0.93	1.7%	693
WB	0.80	2.4%	377
NB	0.92	0.9%	561
SB	0.87	1.1%	1,043
<b>Intersection</b>	<b>0.96</b>	<b>1.4%</b>	<b>2,674</b>

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

# Total Vehicle Summary



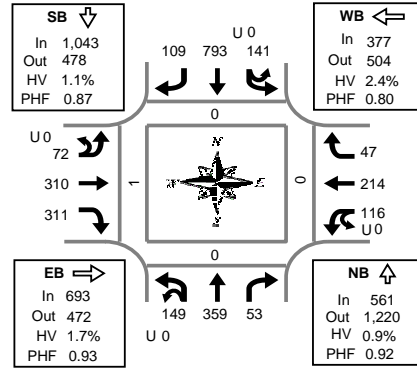
Eric Boivin  
(303) 668-0220

Site ID: 1

## SHAW RD E & E PIONEER AVE

Tuesday, February 03, 2015

4:00 PM to 6:00 PM



### Peak Hour Summary 4:30 PM to 5:30 PM

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

Interval Start Time	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	0	36	105	24	0	30	182	16	0	15	95	79	0	23	43	14	662	1	0	0	0
4:15 PM	0	38	65	13	0	34	209	22	0	20	72	59	0	30	53	14	629	0	0	0	0
4:30 PM	0	38	98	17	0	44	194	31	0	16	63	72	0	33	51	15	672	0	0	0	0
4:45 PM	0	34	97	10	0	23	171	18	0	26	86	75	0	33	67	18	658	0	0	0	0
5:00 PM	0	31	89	12	0	37	226	37	0	15	92	80	0	20	44	10	693	0	0	0	1
5:15 PM	0	46	75	14	0	37	202	23	0	15	69	84	0	30	52	4	651	0	0	0	0
5:30 PM	0	29	86	18	0	20	216	30	0	16	67	68	0	18	55	10	633	0	0	0	0
5:45 PM	0	37	99	12	0	23	215	25	0	17	59	53	0	21	36	11	608	0	0	0	0
Total Survey	0	289	714	120	0	248	1,615	202	0	140	603	570	0	208	401	96	5,206	1	0	0	1

### Peak Hour Summary 4:30 PM to 5:30 PM

By Approach	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV		North	South	East	West
Volume	561	1,220	1,781	5	1,043	478	1,521	11	693	472	1,165	12	377	504	881	9	2,674	0	0	0	1
%HV	0.9%				1.1%				1.7%				2.4%				1.4%				
PHF	0.92				0.87				0.93				0.80				0.96				

By Movement	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Total
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Volume	0	149	359	53	0	141	793	109	0	72	310	311	0	116	214	47	2,674
%HV	0.0%	0.7%	1.1%	0.0%	0.0%	2.8%	0.8%	0.9%	0.0%	0.0%	1.9%	1.9%	0.0%	0.0%	2.3%	8.5%	1.4%
PHF	0.00	0.81	0.92	0.78	0.00	0.80	0.88	0.74	0.00	0.69	0.84	0.93	0.00	0.88	0.80	0.65	0.96

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

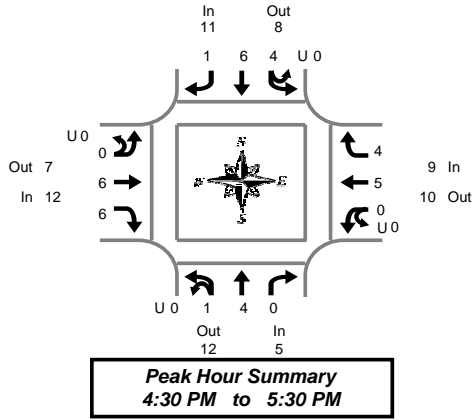
Interval Start Time	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound E PIONEER AVE				Westbound E PIONEER AVE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	0	146	365	64	0	131	756	87	0	77	316	285	0	119	214	61	2,621	1	0	0	0
4:15 PM	0	141	349	52	0	138	800	108	0	77	313	286	0	116	215	57	2,652	0	0	0	1
4:30 PM	0	149	359	53	0	141	793	109	0	72	310	311	0	116	214	47	2,674	0	0	0	1
4:45 PM	0	140	347	54	0	117	815	108	0	72	314	307	0	101	218	42	2,635	0	0	0	1
5:00 PM	0	143	349	56	0	117	859	115	0	63	287	285	0	89	187	35	2,585	0	0	0	1



# Heavy Vehicle Summary



Eric Boivin  
(303) 668-0220



## SHAW RD E & E PIONEER AVE

Tuesday, February 03, 2015  
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound SHAW RD E					Southbound SHAW RD E					Eastbound E PIONEER AVE					Westbound E PIONEER AVE					Interval Total
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	
4:00 PM	0	1	1	1	3	0	0	0	0	0	0	0	2	1	3	0	1	2	1	4	10
4:15 PM	0	0	3	1	4	0	1	2	0	3	0	1	3	1	5	0	0	1	0	1	13
4:30 PM	0	0	1	0	1	0	1	0	0	1	0	0	2	1	3	0	0	1	2	3	10
4:45 PM	0	0	0	0	0	0	1	1	0	2	0	0	2	2	4	0	0	2	2	4	10
5:00 PM	0	0	1	0	1	0	0	2	1	3	0	0	2	1	3	0	0	1	0	1	8
5:15 PM	0	1	2	0	3	0	1	2	0	3	0	0	2	2	4	0	0	1	0	1	9
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	2	0	2	4
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	1	2	0	0	0	0	0	2	3
Total Survey	0	3	8	2	13	0	5	8	1	14	0	2	14	8	24	0	1	10	5	16	16

Peak Hour Summary  
4:30 PM to 5:30 PM

By Approach	Northbound SHAW RD E			Southbound SHAW RD E			Eastbound E PIONEER AVE			Westbound E PIONEER AVE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	12	17	11	8	19	12	7	19	9	10	19	37

By Movement	Northbound SHAW RD E					Southbound SHAW RD E					Eastbound E PIONEER AVE					Westbound E PIONEER AVE					Total
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	
Volume	0	1	4	0	5	0	4	6	1	11	0	0	6	6	12	0	0	5	4	9	37

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

Interval Start Time	Northbound SHAW RD E					Southbound SHAW RD E					Eastbound E PIONEER AVE					Westbound E PIONEER AVE					Interval Total
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	
4:00 PM	0	1	5	2	8	0	4	4	0	8	0	1	9	5	15	0	1	6	5	12	43
4:15 PM	0	0	5	1	6	0	4	6	1	11	0	1	9	5	15	0	0	5	4	9	41
4:30 PM	0	1	4	0	5	0	4	6	1	11	0	0	6	6	12	0	0	5	4	9	37
4:45 PM	0	1	3	0	4	0	2	5	1	8	0	0	6	5	11	0	0	6	2	8	31
5:00 PM	0	2	3	0	5	0	1	4	1	6	0	1	5	3	9	0	0	4	0	4	24



(303) 216-2439  
www.alltrafficdata.net

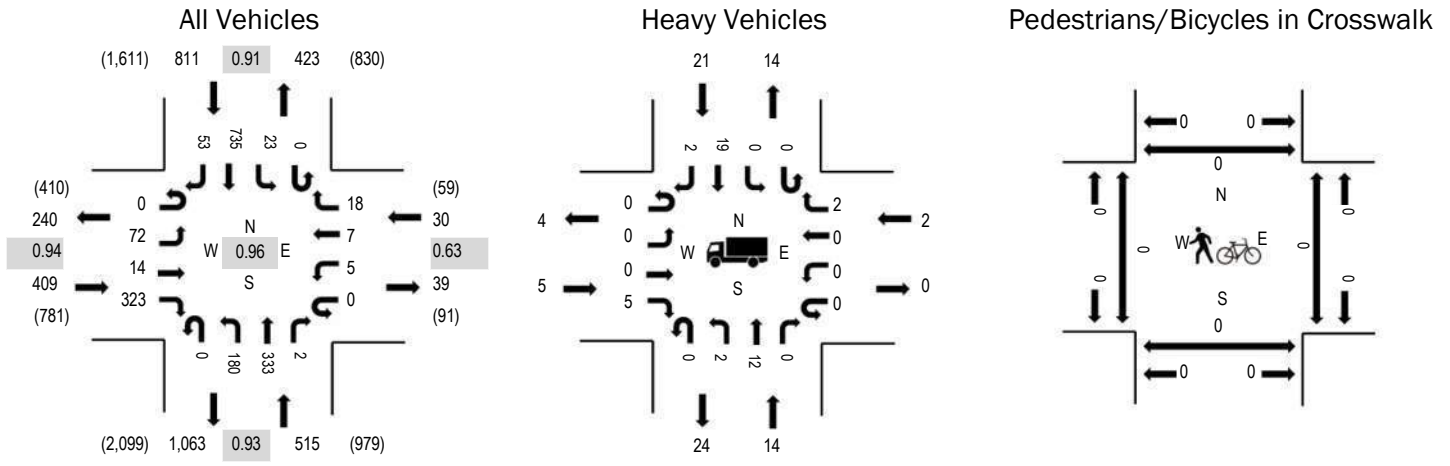
Location: 8 HIGHWAY 162 & BOWMAN-HILTON RD E PM

Date and Start Time: Tuesday, November 3, 2015

Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:00 PM - 04:15 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.2%	0.94
WB	6.7%	0.63
NB	2.7%	0.93
SB	2.6%	0.91
All	2.4%	0.96

**Traffic Counts - All Vehicles**

Interval Start Time	PIONEER WAY E Eastbound				BOWMAN-HILTON RD E Westbound				HIGHWAY 162 Northbound				HIGHWAY 162 Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	19	6	73	0	4	2	6	0	42	84	0	0	5	200	18	459	1,765
4:15:00 PM	0	17	2	86	0	0	1	7	0	44	92	2	0	4	168	12	435	1,724
4:30:00 PM	0	22	6	81	0	0	2	3	0	35	84	0	0	7	180	9	429	1,731
4:45:00 PM	0	14	0	83	0	1	2	2	0	59	73	0	0	7	187	14	442	1,698
5:00:00 PM	0	18	6	87	0	0	5	2	0	37	71	1	0	5	176	10	418	1,665
5:15:00 PM	0	12	3	67	0	0	1	6	0	35	94	0	0	9	203	12	442	
5:30:00 PM	0	12	9	73	0	1	3	6	0	25	85	1	0	6	172	3	396	
5:45:00 PM	0	14	7	64	0	1	2	2	0	28	85	2	0	3	192	9	409	
Count Total	0	128	39	614	0	7	18	34	0	305	668	6	0	46	1,478	87	3,430	
Peak Hour	0	72	14	323	0	5	7	18	0	180	333	2	0	23	735	53	1,765	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	1	0	9	7	17	0	0	0	0	0
4:15:00 PM	1	2	3	4	10	0	0	0	0	0
4:30:00 PM	3	0	1	7	11	0	0	0	0	0
4:45:00 PM	0	0	1	3	4	0	0	0	0	0
5:00:00 PM	1	1	4	3	9	0	0	0	0	0
5:15:00 PM	1	0	4	1	6	0	0	0	0	0
5:30:00 PM	2	0	4	5	11	0	0	0	0	0
5:45:00 PM	0	0	2	2	4	0	0	0	0	0
Count Total	9	3	28	32	72	0	0	0	0	0
Peak Hour	5	2	14	21	42	0	0	0	0	0

Peak Hour Summary

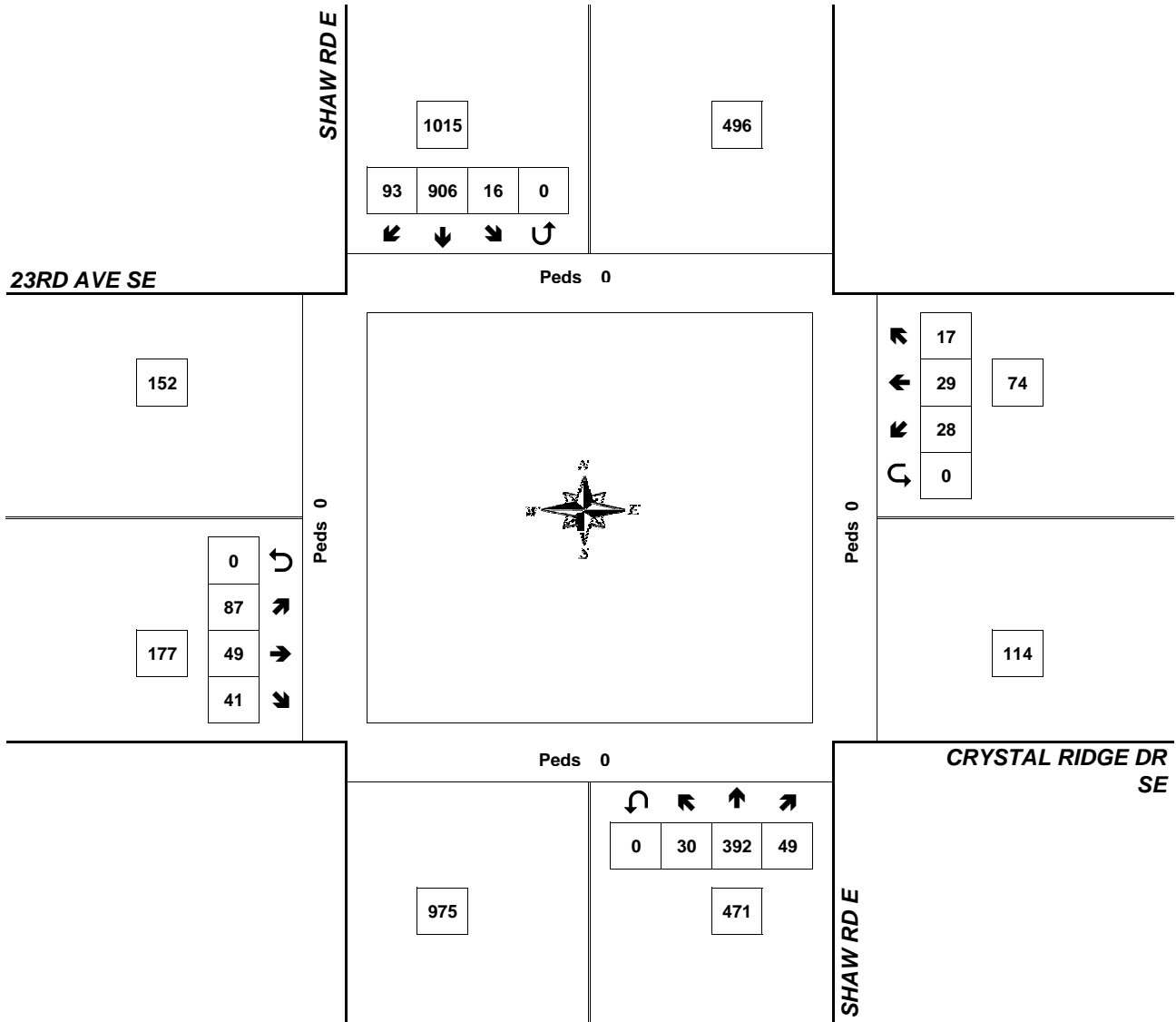
Site ID: 11



Eric Boivin  
(303) 668-0220

SHAW RD E & CRYSTAL RIDGE DR SE

4:45 PM to 5:45 PM  
Tuesday, February 03, 2015



Approach	PHF	HV%	Volume
EB	0.85	1.7%	177
WB	0.77	2.7%	74
NB	0.91	1.7%	471
SB	0.95	1.3%	1,015
<b>Intersection</b>	<b>0.97</b>	<b>1.5%</b>	<b>1,737</b>

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

# Total Vehicle Summary



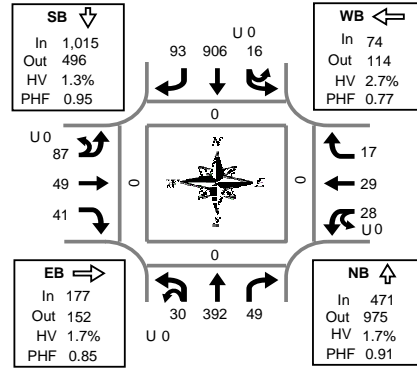
Eric Boivin  
(303) 668-0220

Site ID: 11

## SHAW RD E & CRYSTAL RIDGE DR SE

Tuesday, February 03, 2015

4:00 PM to 6:00 PM



**Peak Hour Summary**  
4:45 PM to 5:45 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound 23RD AVE SE				Westbound CRYSTAL RIDGE DR SE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	0	11	102	9	0	6	218	31	0	26	10	8	0	15	8	4	448	0	0	0	1
4:15 PM	0	7	91	8	0	9	224	30	0	13	12	9	0	5	7	4	419	0	0	0	0
4:30 PM	0	11	116	12	1	3	231	22	0	12	10	14	0	5	8	2	447	0	0	0	0
4:45 PM	0	5	107	12	0	7	195	24	0	28	8	16	0	7	8	5	422	0	0	0	0
5:00 PM	0	7	91	10	0	3	241	20	0	20	14	11	0	10	5	2	434	0	0	0	0
5:15 PM	0	6	95	9	0	3	234	29	0	21	13	9	0	1	8	4	432	0	0	0	0
5:30 PM	0	12	99	18	0	3	236	20	0	18	14	5	0	10	8	6	449	0	0	0	0
5:45 PM	0	12	103	6	0	5	228	19	0	15	10	9	0	7	6	2	422	0	0	0	0
Total Survey	0	71	804	84	1	39	1,807	195	0	153	91	81	0	60	58	29	3,473	0	0	0	1

### Peak Hour Summary

4:45 PM to 5:45 PM

By Approach	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound 23RD AVE SE				Westbound CRYSTAL RIDGE DR SE				Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV		North	South	East	West
Volume	471	975	1,446	8	1,015	496	1,511	13	177	152	329	3	74	114	188	2	1,737	0	0	0	0
%HV	1.7%				1.3%				1.7%				2.7%				1.5%				
PHF	0.91				0.95				0.85				0.77				0.97				

By Movement	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound 23RD AVE SE				Westbound CRYSTAL RIDGE DR SE				Total
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Volume	0	30	392	49	0	16	906	93	0	87	49	41	0	28	29	17	1,737
%HV	0.0%	6.7%	1.3%	2.0%	0.0%	6.3%	1.2%	1.1%	0.0%	0.0%	2.0%	4.9%	0.0%	0.0%	3.4%	5.9%	1.5%
PHF	0.00	0.63	0.92	0.68	0.00	0.57	0.94	0.80	0.00	0.78	0.88	0.64	0.00	0.70	0.91	0.71	0.97

### Rolling Hour Summary

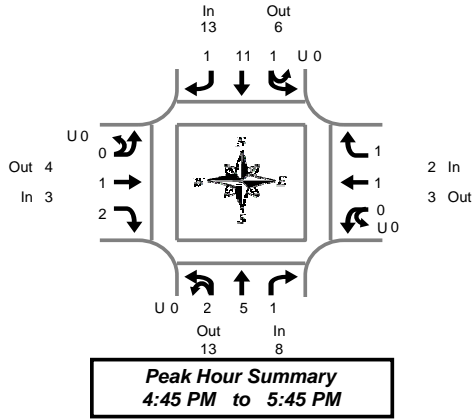
4:00 PM to 6:00 PM

Interval Start Time	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound 23RD AVE SE				Westbound CRYSTAL RIDGE DR SE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	0	34	416	41	1	25	868	107	0	79	40	47	0	32	31	15	1,736	0	0	0	1
4:15 PM	0	30	405	42	1	22	891	96	0	73	44	50	0	27	28	13	1,722	0	0	0	0
4:30 PM	0	29	409	43	1	16	901	95	0	81	45	50	0	23	29	13	1,735	0	0	0	0
4:45 PM	0	30	392	49	0	16	906	93	0	87	49	41	0	28	29	17	1,737	0	0	0	0
5:00 PM	0	37	388	43	0	14	939	88	0	74	51	34	0	28	27	14	1,737	0	0	0	0

# Heavy Vehicle Summary



Eric Boivin  
(303) 668-0220



## SHAW RD E & CRYSTAL RIDGE DR SE

Tuesday, February 03, 2015  
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound SHAW RD E					Southbound SHAW RD E					Eastbound 23RD AVE SE					Westbound CRYSTAL RIDGE DR SE					Interval Total
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	
4:00 PM	0	3	2	0	5	0	1	1	0	2	0	0	0	1	1	0	0	0	0	0	8
4:15 PM	0	0	2	0	2	0	0	1	0	1	0	1	0	0	0	1	0	0	0	1	5
4:30 PM	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	1	0	1	6
4:45 PM	0	0	0	1	1	0	0	2	0	2	0	0	0	1	1	0	0	1	0	1	5
5:00 PM	0	0	1	0	1	0	0	3	0	3	0	0	1	0	1	0	0	0	0	0	5
5:15 PM	0	1	2	0	3	0	0	5	1	6	0	0	0	0	0	0	0	0	1	1	10
5:30 PM	0	1	2	0	3	0	1	1	0	2	0	0	0	1	1	0	0	0	0	0	6
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Survey	0	6	9	1	16	0	2	18	1	21	0	1	1	3	5	0	0	2	2	4	7

Peak Hour Summary  
4:45 PM to 5:45 PM

By Approach	Northbound SHAW RD E			Southbound SHAW RD E			Eastbound 23RD AVE SE			Westbound CRYSTAL RIDGE DR SE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	8	13	21	13	6	19	3	4	7	2	3	5	26

By Movement	Northbound SHAW RD E					Southbound SHAW RD E					Eastbound 23RD AVE SE					Westbound CRYSTAL RIDGE DR SE					Total
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	
Volume	0	2	5	1	8	0	1	11	1	13	0	0	1	2	3	0	0	1	1	2	26

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

Interval Start Time	Northbound SHAW RD E					Southbound SHAW RD E					Eastbound 23RD AVE SE					Westbound CRYSTAL RIDGE DR SE					Interval Total
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	
4:00 PM	0	3	4	1	8	0	1	9	0	10	0	1	0	2	3	0	0	2	1	3	24
4:15 PM	0	0	3	1	4	0	0	11	0	11	0	1	1	1	3	0	0	2	1	3	21
4:30 PM	0	1	3	1	5	0	0	15	1	16	0	0	1	1	2	0	0	2	1	3	26
4:45 PM	0	2	5	1	8	0	1	11	1	13	0	0	1	2	3	0	0	1	1	2	26
5:00 PM	0	3	5	0	8	0	1	9	1	11	0	0	1	1	2	0	0	0	1	1	22

Peak Hour Summary

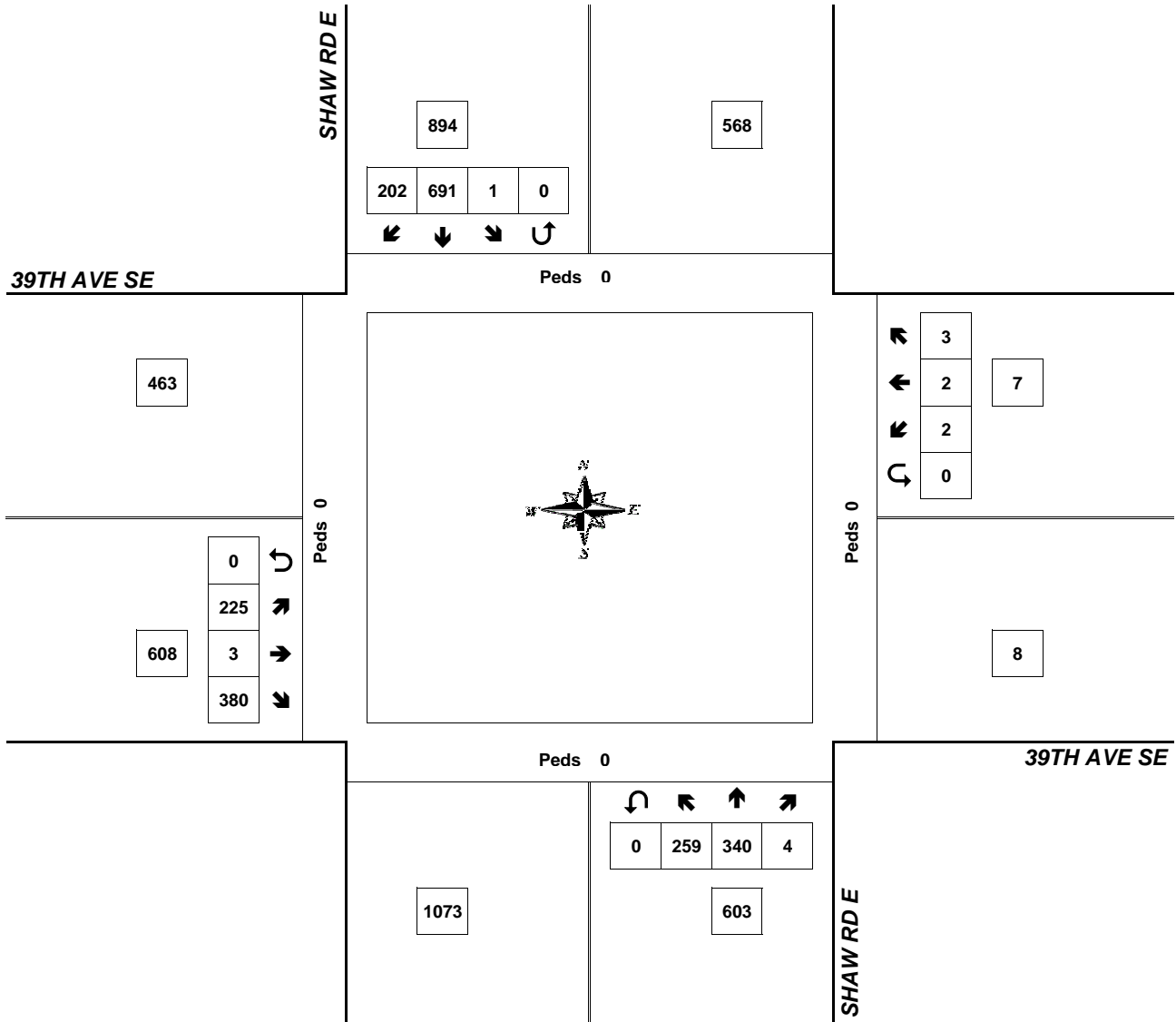
Site ID: 12



Eric Boivin  
(303) 668-0220

SHAW RD E & 39TH AVE SE

4:45 PM to 5:45 PM  
Tuesday, February 03, 2015



Approach	PHF	HV%	Volume
EB	0.94	0.0%	608
WB	0.58	14.3%	7
NB	0.91	0.5%	603
SB	0.96	1.6%	894
<b>Intersection</b>	<b>0.94</b>	<b>0.9%</b>	<b>2,112</b>

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

# Total Vehicle Summary



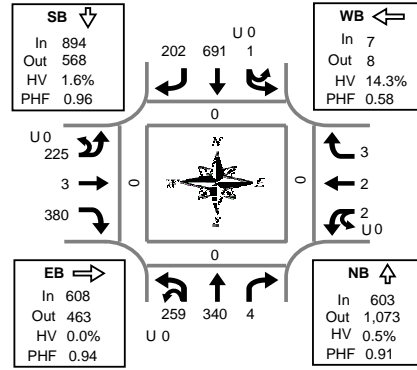
Eric Boivin  
(303) 668-0220

Site ID: 12

## SHAW RD E & 39TH AVE SE

Tuesday, February 03, 2015

4:00 PM to 6:00 PM



**Peak Hour Summary**  
4:45 PM to 5:45 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound 39TH AVE SE				Westbound 39TH AVE SE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	0	59	78	1	0	0	148	53	0	53	0	94	0	0	2	1	489	0	0	0	0
4:15 PM	0	58	84	1	0	0	182	49	0	55	1	98	0	0	1	1	530	0	0	0	0
4:30 PM	0	52	90	0	0	0	169	55	0	56	0	119	0	1	0	0	542	0	0	0	0
4:45 PM	0	48	90	2	0	0	164	49	0	54	2	89	0	0	2	1	501	0	0	0	0
5:00 PM	0	74	77	0	0	0	165	50	0	55	0	86	0	0	0	0	507	0	0	0	0
5:15 PM	0	76	87	2	0	0	183	49	0	48	0	114	0	2	0	0	561	0	0	0	0
5:30 PM	0	61	86	0	0	1	179	54	0	68	1	91	0	0	0	2	543	0	0	0	0
5:45 PM	0	48	90	0	0	1	173	44	0	54	1	83	0	0	2	0	496	0	0	0	0
Total Survey	0	476	682	6	0	2	1,363	403	0	443	5	774	0	3	7	5	4,169	0	0	0	0

### Peak Hour Summary

4:45 PM to 5:45 PM

By Approach	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound 39TH AVE SE				Westbound 39TH AVE SE				Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV		North	South	East	West
Volume	603	1,073	1,676	3	894	568	1,462	14	608	463	1,071	0	7	8	15	1	2,112	0	0	0	0
%HV	0.5%				1.6%				0.0%				14.3%				0.9%				
PHF	0.91				0.96				0.94				0.58				0.94				

By Movement	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound 39TH AVE SE				Westbound 39TH AVE SE				Total
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Volume	0	259	340	4	0	1	691	202	0	225	3	380	0	2	2	3	2,112
%HV	0.0%	0.0%	0.9%	0.0%	0.0%	#####	1.6%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	0.9%
PHF	0.00	0.85	0.94	0.50	0.00	0.25	0.94	0.94	0.00	0.83	0.38	0.83	0.00	0.25	0.25	0.38	0.94

### Rolling Hour Summary

4:00 PM to 6:00 PM

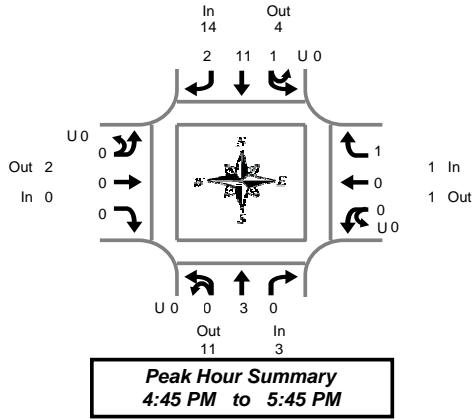
Interval Start Time	Northbound SHAW RD E				Southbound SHAW RD E				Eastbound 39TH AVE SE				Westbound 39TH AVE SE				Interval Total	Pedestrians & Bicycles In Crosswalk (By Location)			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		North	South	East	West
4:00 PM	0	217	342	4	0	0	663	206	0	218	3	400	0	1	5	3	2,062	0	0	0	0
4:15 PM	0	232	341	3	0	0	680	203	0	220	3	392	0	1	3	2	2,080	0	0	0	0
4:30 PM	0	250	344	4	0	0	681	203	0	213	2	408	0	3	2	1	2,111	0	0	0	0
4:45 PM	0	259	340	4	0	1	691	202	0	225	3	380	0	2	2	3	2,112	0	0	0	0
5:00 PM	0	259	340	2	0	2	700	197	0	225	2	374	0	2	2	2	2,107	0	0	0	0



# Heavy Vehicle Summary



Eric Boivin  
(303) 668-0220



## SHAW RD E & 39TH AVE SE

Tuesday, February 03, 2015  
4:00 PM to 6:00 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound SHAW RD E					Southbound SHAW RD E					Eastbound 39TH AVE SE					Westbound 39TH AVE SE					Interval Total
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	
4:00 PM	0	0	3	0	3	0	0	1	1	2	0	1	0	0	1	0	0	0	0	0	6
4:15 PM	0	1	1	0	2	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	5
4:30 PM	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	0	1	0	1	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	5
5:00 PM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	3
5:15 PM	0	0	1	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	1	0	1	0	1	4	0	5	0	0	0	0	0	0	0	0	1	1	7
5:45 PM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total Survey	0	1	8	0	9	0	1	15	4	20	0	2	0	2	4	0	0	0	1	1	7

### Peak Hour Summary

4:45 PM to 5:45 PM

By Approach	Northbound SHAW RD E			Southbound SHAW RD E			Eastbound 39TH AVE SE			Westbound 39TH AVE SE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	11	14	14	4	18	0	2	2	1	1	2	18

By Movement	Northbound SHAW RD E					Southbound SHAW RD E					Eastbound 39TH AVE SE					Westbound 39TH AVE SE					Total
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	
Volume	0	0	3	0	3	0	1	11	2	14	0	0	0	0	0	0	0	0	1	1	18

### Rolling Hour Summary

4:00 PM to 6:00 PM

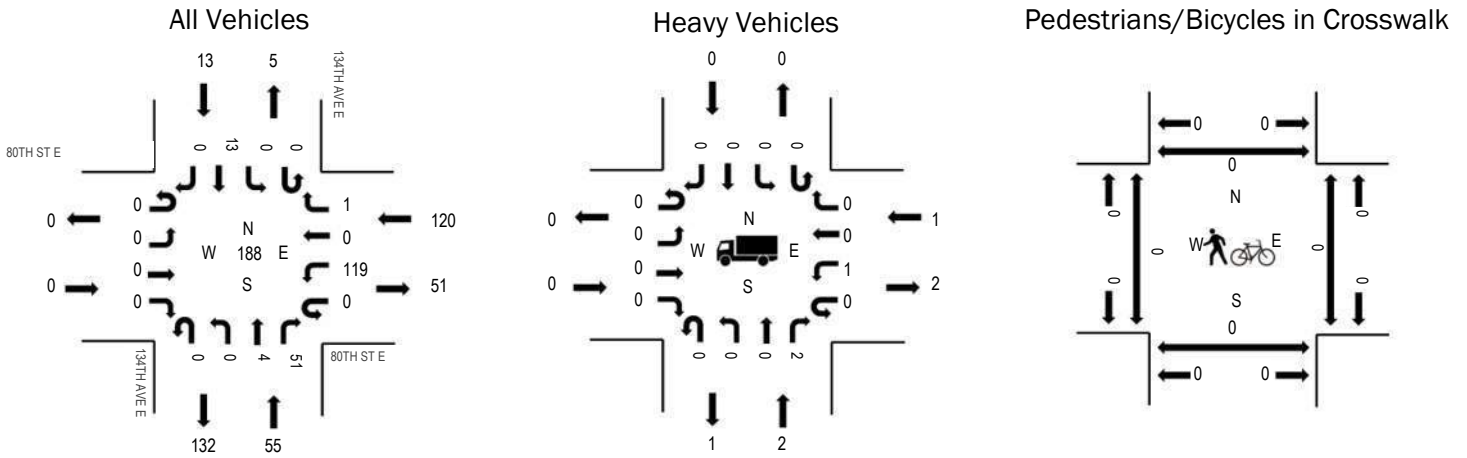
Interval Start Time	Northbound SHAW RD E					Southbound SHAW RD E					Eastbound 39TH AVE SE					Westbound 39TH AVE SE					Interval Total
	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	U	L	T	R	Total	
4:00 PM	0	1	5	0	6	0	0	6	4	10	0	1	0	2	3	0	0	0	0	0	19
4:15 PM	0	1	2	0	3	0	0	8	3	11	0	0	0	2	2	0	0	0	0	0	16
4:30 PM	0	0	2	0	2	0	0	9	3	12	0	0	0	0	0	0	0	0	0	0	14
4:45 PM	0	0	3	0	3	0	1	11	2	14	0	0	0	0	0	0	0	0	1	1	18
5:00 PM	0	0	3	0	3	0	1	9	0	10	0	1	0	0	1	0	0	0	1	1	15



Location: 6 134TH AVE E & 80TH ST E PM  
 Date and Start Time: Wednesday, January 6, 2016  
 Peak Hour: 04:00 PM - 05:00 PM

(303) 216-2439  
 www.alltrafficdata.net

**Peak Hour**



	HV%	PHF
EB		0.00
WB	0.8%	0.91
NB	3.6%	0.92
SB	0.0%	0.65
All	1.6%	0.94

**Traffic Counts - All Vehicles**

Interval Start Time	80TH ST E Eastbound				80TH ST E Westbound				134TH AVE E Northbound				134TH AVE E Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM	0	0	0	0	0	26	0	1	0	0	0	15	0	0	3	0	45	188
4:15:00 PM	0	0	0	0	0	28	0	0	0	0	0	14	0	0	1	0	43	180
4:30:00 PM	0	0	0	0	0	33	0	0	0	0	1	12	0	0	4	0	50	179
4:45:00 PM	0	0	0	0	0	32	0	0	0	0	3	10	0	0	5	0	50	173
5:00:00 PM	0	0	0	0	0	28	0	1	0	0	0	8	0	0	0	0	37	160
5:15:00 PM	0	0	0	0	0	24	0	2	0	0	1	13	0	1	1	0	42	
5:30:00 PM	0	0	0	0	0	27	0	0	0	0	2	14	0	0	1	0	44	
5:45:00 PM	0	0	0	0	0	30	0	0	0	0	0	7	0	0	0	0	37	
Count Total	0	0	0	0	0	228	0	4	0	0	7	93	0	1	15	0	348	
Peak Hour	0	0	0	0	0	119	0	1	0	0	4	51	0	0	13	0	188	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

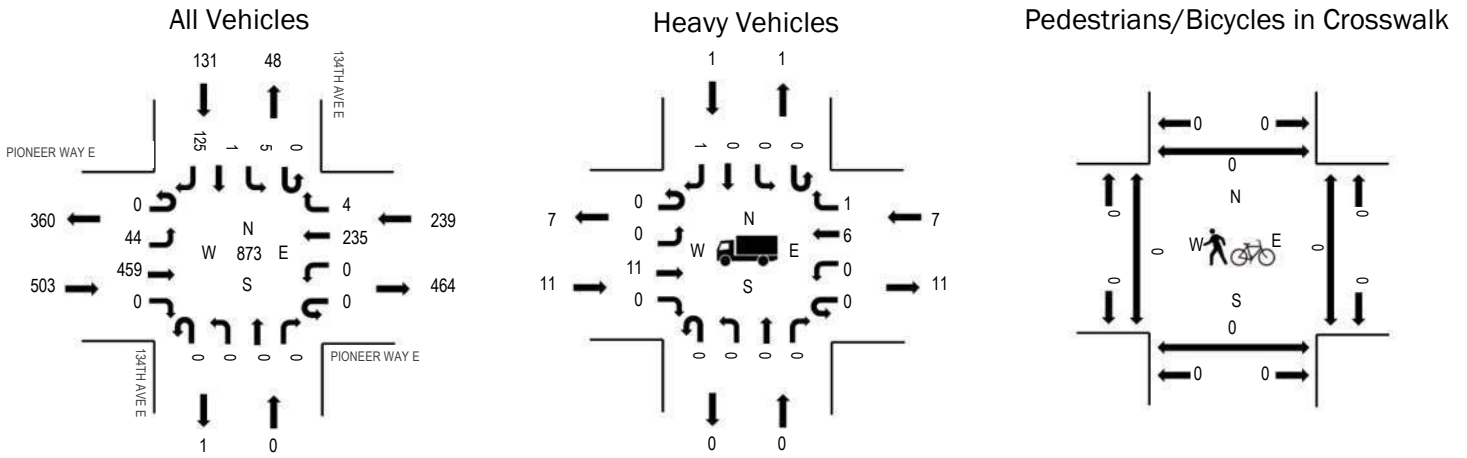
Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	0	0	1	0	1	0	0	0	0	0
4:15:00 PM	0	0	0	0	0	0	0	0	0	0
4:30:00 PM	0	0	1	0	1	0	0	0	0	0
4:45:00 PM	0	1	0	0	1	0	0	0	0	0
5:00:00 PM	0	0	0	0	0	0	0	0	0	0
5:15:00 PM	0	0	0	0	0	0	0	0	0	0
5:30:00 PM	0	0	0	0	0	0	0	0	0	0
5:45:00 PM	0	0	0	0	0	0	0	0	0	0
Count Total	0	1	2	0	3	0	0	0	0	0
Peak Hour	0	1	2	0	3	0	0	0	0	0



Location: 5 134TH AVE E & PIONEER WAY E PM  
 Date and Start Time: Wednesday, January 6, 2016  
 Peak Hour: 04:30 PM - 05:30 PM

(303) 216-2439  
 www.alltrafficdata.net

**Peak Hour**



	HV%	PHF
EB	2.2%	0.97
WB	2.9%	0.83
NB		0.00
SB	0.8%	0.84
All	2.2%	0.96

**Traffic Counts - All Vehicles**

Interval Start Time	PIONEER WAY E Eastbound				PIONEER WAY E Westbound				134TH AVE E Northbound				134TH AVE E Southbound				Total	Rolling Hour	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			
4:00:00 PM	0	13	100	0	0	0	58	2	0	0	0	0	0	0	0	0	28	201	839
4:15:00 PM	0	13	94	0	0	0	66	1	0	0	0	0	0	0	0	0	29	203	866
4:30:00 PM	0	12	117	0	0	0	51	2	0	0	0	0	0	3	0	0	34	219	873
4:45:00 PM	0	12	106	0	0	0	58	1	0	0	0	0	0	1	0	0	38	216	847
5:00:00 PM	0	8	118	0	0	0	72	0	0	0	0	0	0	0	1	0	29	228	773
5:15:00 PM	0	12	118	0	0	0	54	1	0	0	0	0	0	1	0	0	24	210	
5:30:00 PM	0	16	117	0	0	0	31	0	0	0	0	0	0	0	0	0	29	193	
5:45:00 PM	0	7	71	0	0	0	34	0	0	0	0	0	0	0	0	0	30	142	
Count Total	0	93	841	0	0	0	424	7	0	0	0	0	0	5	1	0	241	1,612	
Peak Hour	0	44	459	0	0	0	235	4	0	0	0	0	0	5	1	0	125	873	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM	0	2	0	0	2	0	0	0	0	0
4:15:00 PM	1	1	0	0	2	0	0	0	0	0
4:30:00 PM	1	3	0	0	4	0	0	0	0	0
4:45:00 PM	2	0	0	1	3	0	0	0	0	0
5:00:00 PM	5	2	0	0	7	0	0	0	0	0
5:15:00 PM	3	2	0	0	5	0	0	0	0	0
5:30:00 PM	1	1	0	0	2	0	0	0	0	0
5:45:00 PM	1	0	0	0	1	0	0	0	0	0
Count Total	14	11	0	1	26	0	0	0	0	0
Peak Hour	11	7	0	1	19	0	0	0	0	0



(303) 216-2439  
www.alltrafficdata.net

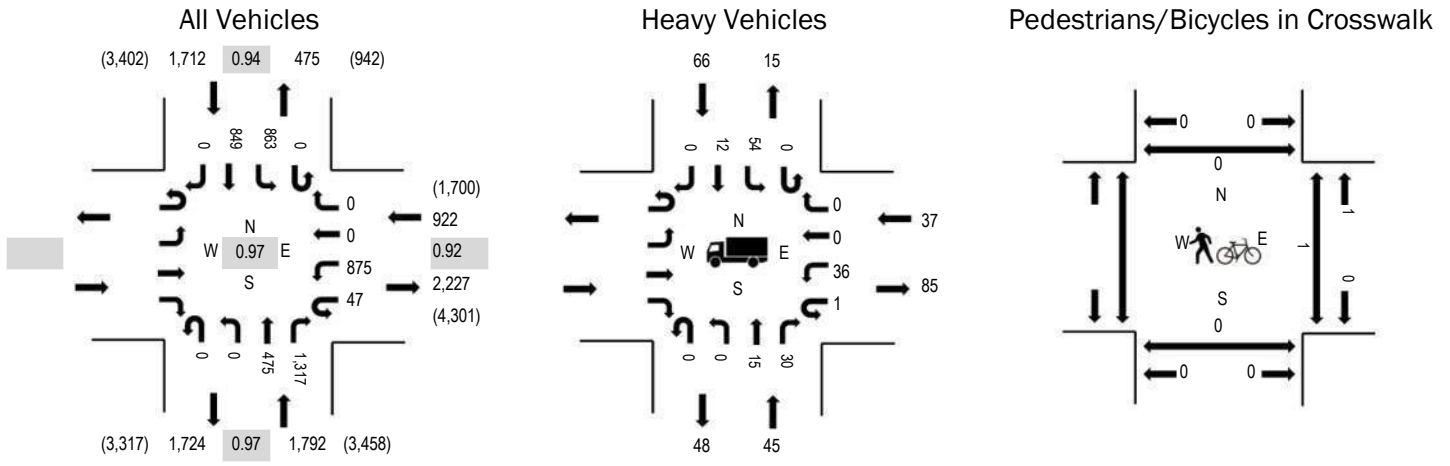
Location: 5A N MERIDIAN & SR167 SB OFF-NB ON PM

Date and Start Time: Tuesday, November 3, 2015

Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 05:30 PM - 05:45 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB		
WB	4.0%	0.92
NB	2.5%	0.97
SB	3.9%	0.94
All	3.3%	0.97

**Traffic Counts - All Vehicles**

Interval Start Time	Eastbound				SR167 SB OFF-NB ON Westbound				N MERIDIAN Northbound				N MERIDIAN Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00:00 PM					1	171	0	0	1	0	125	296	0	213	213	0	1,020	4,209
4:15:00 PM					1	157	0	0	0	0	124	318	0	212	186	0	998	4,267
4:30:00 PM					5	186	0	0	0	0	111	311	0	229	217	0	1,059	4,349
4:45:00 PM					9	231	0	0	0	0	115	334	0	232	211	0	1,132	4,426
5:00:00 PM					13	207	0	0	0	0	126	334	0	198	200	0	1,078	4,351
5:15:00 PM					11	200	0	0	0	0	128	324	0	207	210	0	1,080	
5:30:00 PM					14	237	0	0	0	0	106	325	0	226	228	0	1,136	
5:45:00 PM					9	248	0	0	0	0	107	273	0	206	214	0	1,057	
Count Total					63	1,637	0	0	1	0	942	2,515	0	1,723	1,679	0	8,560	
Peak Hour					47	875	0	0	0	0	475	1,317	0	863	849	0	4,426	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

Interval Start Time	Heavy Vehicle Totals					Pedestrians/Bikes in Crosswalk				
	EB	WB	NB	SB	Total	West	East	South	North	Total
4:00:00 PM		10	19	41	70		0	0	0	0
4:15:00 PM		10	13	20	43		0	0	0	0
4:30:00 PM		10	22	24	56		0	0	0	0
4:45:00 PM		9	6	14	29		1	0	0	1
5:00:00 PM		17	18	18	53		0	0	0	0
5:15:00 PM		10	15	16	41		0	0	0	0
5:30:00 PM		1	6	18	25		0	0	0	0
5:45:00 PM		6	6	18	30		0	0	0	0
Count Total		73	105	169	347		1	0	0	1
Peak Hour		37	45	66	148		1	0	0	1

# Appendix B

## Trip Generation Calculations

## Knutson Farms Trip Generation Estimate

**3.012 Million SF (75% High Cube, 12.5% Manufacturing, 12.5% Warehouse)**

Land Use	Size	Units <sup>1</sup>	ITE LUC <sup>2</sup>	Trip Rate <sup>2</sup>	Directional Split <sup>2</sup>		Vehicle Trip Generation		
					Enter	Exit	Enter	Exit	Total
<b>DAILY</b>									
<b>Proposed Uses:</b>									
Manufacturing	376,500	GFA	140	equation	50%	50%	720	720	1,440
High-Cube Warehouse-Distribution Center	2,259,000	GFA	152	1.68	50%	50%	1,897	1,898	3,795
Warehousing	376,500	GFA	150	equation	50%	50%	771	771	1,542
<b>Proposed Daily Trip Generation:</b>							<b>3,388</b>	<b>3,389</b>	<b>6,777</b>
<b>Less Existing Use:</b>									
Single Family Home	4	DU	210	equation	50%	50%	27	27	54
<b>Existing Daily Trip Generation:</b>							<b>27</b>	<b>27</b>	<b>54</b>
<b>NET NEW DAILY TRIP GENERATION:</b>							<b>3,361</b>	<b>3,362</b>	<b>6,723</b>
<b>AM PEAK HOUR</b>									
<b>Proposed Uses:</b>									
Manufacturing	376,500	GFA	140	equation	78%	22%	221	62	283
High-Cube Warehouse-Distribution Center	2,259,000	GFA	152	equation	69%	31%	201	90	291
Warehousing	376,500	GFA	150	equation	79%	21%	135	36	171
<b>Proposed AM Peak Hour Trip Generation:</b>							<b>557</b>	<b>188</b>	<b>745</b>
<b>Less Existing Use:</b>									
Single Family Home	4	DU	210	0.75	25%	75%	1	2	3
<b>Existing AM Peak Hour Trip Generation:</b>							<b>1</b>	<b>2</b>	<b>3</b>
<b>NET NEW AM PEAK HOUR TRIP GENERATION:</b>							<b>556</b>	<b>186</b>	<b>742</b>
<b>PM PEAK HOUR</b>									
<b>Proposed Uses:</b>									
Manufacturing	376,500	GFA	140	equation	36%	64%	100	178	278
High-Cube Warehouse-Distribution Center	2,259,000	GFA	152	equation	31%	69%	90	200	290
Warehousing	376,500	GFA	150	equation	25%	75%	35	104	139
<b>Proposed PM Peak Hour Trip Generation:</b>							<b>225</b>	<b>482</b>	<b>707</b>
<b>Less Existing Use:</b>									
Single Family Home	4	DU	210	equation	63%	37%	4	2	6
<b>Existing PM Peak Hour Trip Generation:</b>							<b>4</b>	<b>2</b>	<b>6</b>
<b>NET NEW PM PEAK HOUR TRIP GENERATION:</b>							<b>221</b>	<b>480</b>	<b>701</b>

<sup>1</sup> GFA = Gross Floor Area; DU = Dwelling Units

<sup>2</sup> Land Use Code, trip rates, and entering/exiting splits based on ITE Trip Generation Manual, 9th Edition, 2012.

# Appendix C

LOS Result Worksheets

Existing LOS



# Lanes, Volumes, Timings

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

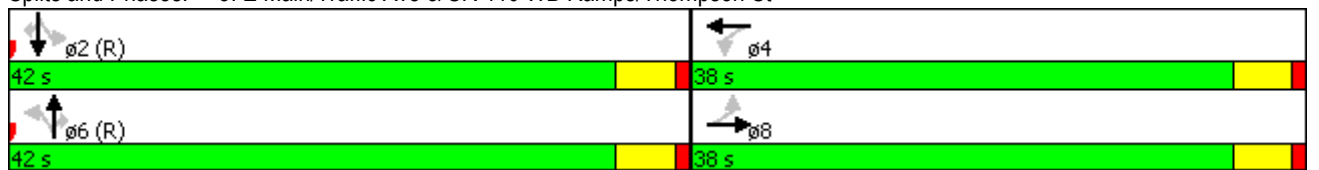


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↗	↖	↖	↗	↗
Volume (vph)	153	29	181	61	70	18	203	694	108	5	155	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	225		0	100		75	110		150
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35				35
Link Distance (ft)		381			354			642				1178
Travel Time (s)		8.7			8.0			12.5				22.9
Confl. Peds. (#/hr)									1	1		
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%	4%	4%	4%	6%	6%	6%	10%	10%	10%
Shared Lane Traffic (%)												
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
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8			4			6				2
Permitted Phases	8			4			6		6	2		2
Detector Phase	8	8		4	4		6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.6	10.6		10.6	10.6		25.6	25.6	25.6	14.6	14.6	14.6
Total Split (s)	38.0	38.0		38.0	38.0		42.0	42.0	42.0	42.0	42.0	42.0
Total Split (%)	47.5%	47.5%		47.5%	47.5%		52.5%	52.5%	52.5%	52.5%	52.5%	52.5%
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	3.6
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)		4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min

### Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 39 (49%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green  
 Natural Cycle: 45  
 Control Type: Actuated-Coordinated






















### Splits and Phases: 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St



# HCM 2010 Signalized Intersection Summary

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	153	29	181	61	70	18	203	694	108	5	155	141
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1845	1900	1827	1827	1900	1792	1792	1792	1727	1727	1727
Adj Flow Rate, veh/h	158	30	187	63	72	19	209	715	111	5	160	145
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
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	4	4	4	6	6	6	10	10	10
Cap, veh/h	227	49	211	350	425	112	643	1040	883	275	1002	851
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.58	0.58	0.58	0.58	0.58	0.58
Sat Flow, veh/h	536	160	692	1137	1394	368	1029	1792	1522	613	1727	1467
Grp Volume(v), veh/h	375	0	0	63	0	91	209	715	111	5	160	145
Grp Sat Flow(s),veh/h/ln	1388	0	0	1137	0	1762	1029	1792	1522	613	1727	1467
Q Serve(g_s), s	17.8	0.0	0.0	0.0	0.0	3.0	9.4	22.3	2.6	0.5	3.4	3.7
Cycle Q Clear(g_c), s	20.8	0.0	0.0	4.7	0.0	3.0	12.9	22.3	2.6	22.7	3.4	3.7
Prop In Lane	0.42		0.50	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	487	0	0	350	0	537	643	1040	883	275	1002	851
V/C Ratio(X)	0.77	0.00	0.00	0.18	0.00	0.17	0.33	0.69	0.13	0.02	0.16	0.17
Avail Cap(c_a), veh/h	651	0	0	478	0	736	643	1040	883	275	1002	851
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	0.70	0.70	0.70	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	0.0	0.0	21.0	0.0	20.4	10.7	11.7	7.6	19.7	7.8	7.8
Incr Delay (d2), s/veh	4.0	0.0	0.0	0.2	0.0	0.1	0.9	2.6	0.2	0.1	0.3	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(0%),veh/ln	8.5	0.0	0.0	1.1	0.0	1.5	2.8	11.7	1.2	0.1	1.7	1.6
LnGrp Delay(d),s/veh	31.0	0.0	0.0	21.2	0.0	20.5	11.7	14.3	7.8	19.8	8.1	8.3
LnGrp LOS	C			C		C	B	B	A	B	A	A
Approach Vol, veh/h		375			154			1035			310	
Approach Delay, s/veh		31.0			20.8			13.1			8.4	
Approach LOS		C			C			B			A	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.0		29.0		51.0		29.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		37.4		33.4		37.4		33.4				
Max Q Clear Time (g_c+1), s		24.7		6.7		24.3		22.8				
Green Ext Time (p_c), s		4.6		2.0		4.7		1.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				16.5								
HCM 2010 LOS				B								

# Lanes, Volumes, Timings

## 4: E Main & SR 410 EB Ramps

1/21/2016

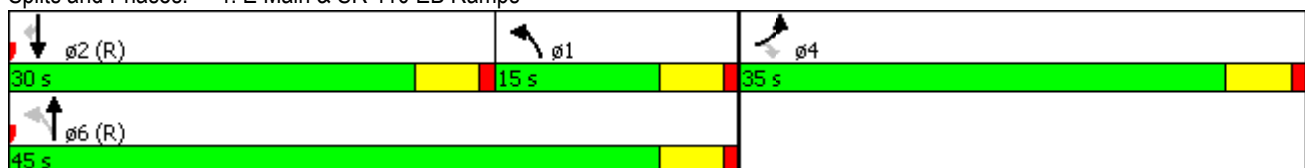


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	366	188	116	616	361	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75	0	175			75
Storage Lanes	1	1	1			1
Taper Length (ft)	50		50			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			35	35	
Link Distance (ft)	516			1317	642	
Travel Time (s)	11.7			25.7	12.5	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	9%	9%	4%	4%	4%	4%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		1	6	2	
Permitted Phases		4	6			2
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	15.0	15.0	15.0
Total Split (s)	35.0	35.0	15.0	45.0	30.0	30.0
Total Split (%)	43.8%	43.8%	18.8%	56.3%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	Min	Min	None	C-Max	C-Max	C-Max

### Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated













### Splits and Phases: 4: E Main & SR 410 EB Ramps



# HCM 2010 Signalized Intersection Summary

## 4: E Main & SR 410 EB Ramps

1/21/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	366	188	116	616	361	49		
Number	7	14	1	6	2	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1743	1743	1827	1827	1827	1827		
Adj Flow Rate, veh/h	377	70	120	635	372	0		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Percent Heavy Veh, %	9	9	4	4	4	4		
Cap, veh/h	434	387	616	1121	571	485		
Arrive On Green	0.26	0.26	0.24	0.61	0.31	0.00		
Sat Flow, veh/h	1660	1482	1740	1827	1827	1553		
Grp Volume(v), veh/h	377	70	120	635	372	0		
Grp Sat Flow(s),veh/h/ln	1660	1482	1740	1827	1827	1553		
Q Serve(g_s), s	17.4	2.9	0.0	16.5	14.1	0.0		
Cycle Q Clear(g_c), s	17.4	2.9	0.0	16.5	14.1	0.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	434	387	616	1121	571	485		
V/C Ratio(X)	0.87	0.18	0.19	0.57	0.65	0.00		
Avail Cap(c_a), veh/h	623	556	616	1121	571	485		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.99	0.00		
Uniform Delay (d), s/veh	28.2	22.9	19.2	9.1	23.7	0.0		
Incr Delay (d2), s/veh	9.8	0.3	0.2	2.1	5.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	9.1	1.2	2.0	8.8	7.9	0.0		
LnGrp Delay(d),s/veh	38.1	23.2	19.4	11.2	29.4	0.0		
LnGrp LOS	D	C	B	B	C			
Approach Vol, veh/h	447			755	372			
Approach Delay, s/veh	35.7			12.5	29.4			
Approach LOS	D			B	C			
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	24.1	30.0		25.9		54.1		
Change Period (Y+Rc), s	5.0	5.0		5.0		5.0		
Max Green Setting (Gmax), s	10.0	25.0		30.0		40.0		
Max Q Clear Time (g_c+I1), s	2.0	16.1		19.4		18.5		
Green Ext Time (p_c), s	1.9	0.8		1.5		2.7		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			23.1					
HCM 2010 LOS			C					

Lanes, Volumes, Timings  
 22: 33rd St SE & 80th St E

1/21/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	83	1	1	31	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30		30			25
Link Distance (ft)	1192		178			687
Travel Time (s)	27.1		4.0			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
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

# HCM Unsignalized Intersection Capacity Analysis

## 22: 33rd St SE & 80th St E

1/21/2016



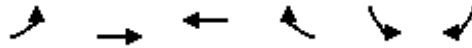
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	83	1	1	31	0	2
Sign Control	Free		Stop			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	92	1	1	34	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		186	0	220	185
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		186	0	220	185
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 %	94		100	97	100	100
cM capacity (veh/h)	1623		669	1085	681	669

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	93	36	2
Volume Left	92	0	0
Volume Right	1	34	0
cSH	1623	1064	669
Volume to Capacity	0.06	0.03	0.00
Queue Length 95th (ft)	5	3	0
Control Delay (s)	7.3	8.5	10.4
Lane LOS	A	A	B
Approach Delay (s)	7.3	8.5	10.4
Approach LOS		A	B

Intersection Summary			
Average Delay		7.7	
Intersection Capacity Utilization		14.7%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings  
 23: E Pioneer & 33rd St SE

1/21/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	30	180	332	0	1	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35	35		25	
Link Distance (ft)		1301	586		178	
Travel Time (s)		25.3	11.4		4.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

**Intersection**

Int Delay, s/veh 1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	30	180	332	0	1	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	32	194	357	0	1	91

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	357	0	615
Stage 1	-	-	357
Stage 2	-	-	258
Critical Hdwy	4.12	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.218	-	3.509
Pot Cap-1 Maneuver	1202	-	456
Stage 1	-	-	710
Stage 2	-	-	787
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1202	-	442
Mov Cap-2 Maneuver	-	-	442
Stage 1	-	-	710
Stage 2	-	-	763

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1202	-	-	-	685
HCM Lane V/C Ratio	0.027	-	-	-	0.135
HCM Control Delay (s)	8.1	0	-	-	11.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5



# Lanes, Volumes, Timings

## 1: N Meridian & Valley Ave NW/Valley Ave NE

1/21/2016

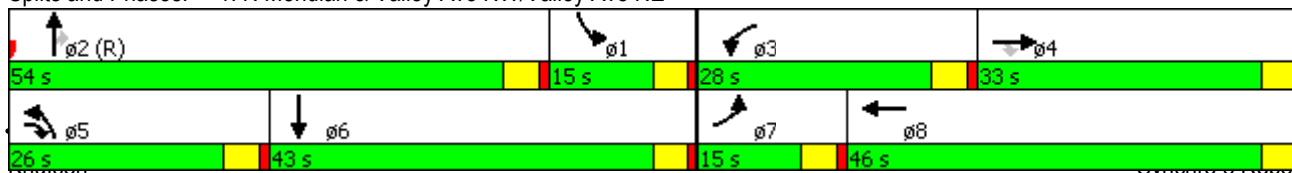


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	499	587	402	135	35	298	447	218	50	789	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			1%			1%	
Storage Length (ft)	250		350	300		0	250		200	200		0
Storage Lanes	1		2	2		0	2		1	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			No			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2026			370			394			1045	
Travel Time (s)		39.5			7.2			7.7			20.4	
Confl. Peds. (#/hr)			3			9			1			5
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 (%)	9%	9%	9%	5%	5%	5%	5%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
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)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4						2			
Detector Phase	7	4	4 5	3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	8.0	4.0	4.0	8.0		4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	8.6	31.6	8.6	8.6	31.6		8.6	31.6	31.6	8.6	37.6	
Total Split (s)	15.0	33.0	26.0	28.0	46.0		26.0	54.0	54.0	15.0	43.0	
Total Split (%)	11.5%	25.4%	20.0%	21.5%	35.4%		20.0%	41.5%	41.5%	11.5%	33.1%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6	3.6	
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	0.0	
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	4.6	4.6	4.6	4.6	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	None	Min	

### Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

### Splits and Phases: 1: N Meridian & Valley Ave NW/Valley Ave NE


























2016 Existing - PM Peak Hour

Dynamic Report

# HCM 2010 Signalized Intersection Summary

## 1: N Meridian & Valley Ave NW/Valley Ave NE

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	38	499	587	402	135	35	298	447	218	50	789	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	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
Adj Sat Flow, veh/h/ln	1734	1734	1734	1800	1800	1890	1800	1800	1800	1853	1853	1890
Adj Flow Rate, veh/h	39	509	599	410	138	0	304	456	0	51	805	0
Adj No. of Lanes	1	2	2	2	2	0	2	2	1	1	2	0
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, %	9	9	9	5	5	5	5	5	5	2	2	2
Cap, veh/h	49	720	852	474	1133	0	371	1300	582	208	1360	0
Arrive On Green	0.03	0.22	0.22	0.14	0.33	0.00	0.04	0.13	0.00	0.12	0.39	0.00
Sat Flow, veh/h	1652	3295	2577	3327	3511	0	3327	3421	1530	1765	3614	0
Grp Volume(v), veh/h	39	509	599	410	138	0	304	456	0	51	805	0
Grp Sat Flow(s),veh/h/ln	1652	1648	1288	1663	1710	0	1663	1710	1530	1765	1761	0
Q Serve(g_s), s	3.1	18.6	26.4	15.7	3.7	0.0	11.8	15.9	0.0	3.4	23.6	0.0
Cycle Q Clear(g_c), s	3.1	18.6	26.4	15.7	3.7	0.0	11.8	15.9	0.0	3.4	23.6	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	49	720	852	474	1133	0	371	1300	582	208	1360	0
V/C Ratio(X)	0.80	0.71	0.70	0.87	0.12	0.00	0.82	0.35	0.00	0.25	0.59	0.00
Avail Cap(c_a), veh/h	132	720	852	599	1133	0	548	1300	582	208	1360	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	1.00	0.00	0.95	0.95	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	62.7	47.0	38.0	54.5	30.3	0.0	61.3	42.2	0.0	52.1	31.7	0.0
Incr Delay (d2), s/veh	17.8	2.1	1.7	10.6	0.0	0.0	5.9	0.7	0.0	0.6	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(0%),veh/ln	1.6	8.7	9.6	7.9	1.7	0.0	5.8	7.7	0.0	1.7	11.6	0.0
LnGrp Delay(d),s/veh	80.5	49.1	39.8	65.1	30.3	0.0	67.2	42.9	0.0	52.7	32.4	0.0
LnGrp LOS	F	D	D	E	C		E	D		D	C	
Approach Vol, veh/h		1147			548			760			856	
Approach Delay, s/veh		45.3			56.3			52.6			33.6	
Approach LOS		D			E			D			C	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.9	54.0	23.1	33.0	19.1	54.8	8.4	47.7				
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6				
Max Green Setting (Gmax), s	10.4	49.4	23.4	28.4	21.4	38.4	10.4	41.4				
Max Q Clear Time (g_c+1), s	5.4	17.9	17.7	28.4	13.8	25.6	5.1	5.7				
Green Ext Time (p_c), s	0.1	1.8	0.8	0.0	0.7	2.9	0.0	6.1				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			45.8									
HCM 2010 LOS			D									
<b>Notes</b>												
User approved changes to right turn type.												

# Lanes, Volumes, Timings

## 2: N Meridian & SR 167 SB Off Ramp

1/21/2016

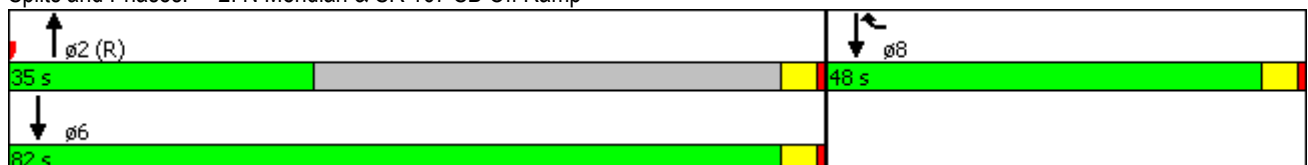


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø6
Lane Configurations		↗↗	↕↕			↖↖	
Volume (vph)	0	493	493	0	0	1784	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	400	0		0	0		
Storage Lanes	0	2		0	0		
Taper Length (ft)	50				50		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	158		482			394	
Travel Time (s)	3.6		11.0			9.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	
Heavy Vehicles (%)	7%	7%	4%	4%	4%	4%	
Shared Lane Traffic (%)							
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	0		24			24	
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		
Turn Type		Prot	NA			NA	
Protected Phases		8	2			6 8	6
Permitted Phases							
Detector Phase		8	2			6 8	
Switch Phase							
Minimum Initial (s)		6.0	10.0				10.0
Minimum Split (s)		10.6	22.6				14.6
Total Split (s)		48.0	35.0				82.0
Total Split (%)		36.9%	26.9%				63%
Yellow Time (s)		3.6	3.6				3.6
All-Red Time (s)		1.0	1.0				1.0
Lost Time Adjust (s)		0.0	0.0				
Total Lost Time (s)		4.6	4.6				
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode		None	C-Min				Min

### Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated

Splits and Phases: 2: N Meridian & SR 167 SB Off Ramp



# HCM Signalized Intersection Capacity Analysis

## 2: N Meridian & SR 167 SB Off Ramp

1/21/2016



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗↗	↕↕			↖↖
Volume (vph)	0	493	493	0	0	1784
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6			4.6
Lane Util. Factor		0.88	0.95			0.95
Frt		0.85	1.00			1.00
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		2656	3471			3471
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		2656	3471			3471
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	498	498	0	0	1802
RTOR Reduction (vph)	0	404	0	0	0	0
Lane Group Flow (vph)	0	94	498	0	0	1802
Heavy Vehicles (%)	7%	7%	4%	4%	4%	4%
Turn Type		Prot	NA			NA
Protected Phases		8	2			6 8
Permitted Phases						
Actuated Green, G (s)		24.5	96.3			130.0
Effective Green, g (s)		24.5	96.3			130.0
Actuated g/C Ratio		0.19	0.74			1.00
Clearance Time (s)		4.6	4.6			
Vehicle Extension (s)		3.0	2.8			
Lane Grp Cap (vph)		500	2571			3471
v/s Ratio Prot		0.04	0.14			c0.52
v/s Ratio Perm						
v/c Ratio		0.19	0.19			0.52
Uniform Delay, d1		44.4	5.1			0.0
Progression Factor		1.00	0.00			1.00
Incremental Delay, d2		0.2	0.1			0.1
Delay (s)		44.6	0.2			0.1
Level of Service		D	A			A
Approach Delay (s)	44.6		0.2			0.1
Approach LOS	D		A			A

### Intersection Summary

HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.2
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Lanes, Volumes, Timings

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

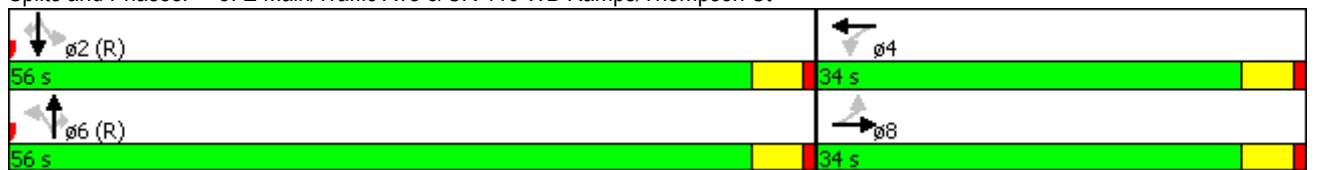


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↗	↖	↖	↗	↖
Volume (vph)	60	18	221	245	114	39	166	376	211	6	364	516
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	225		0	100		75	110		150
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		381			354			642			1178	
Travel Time (s)		8.7			8.0			12.5			22.9	
Confl. Peds. (#/hr)									8	8		
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 (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
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
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6		6	2		2
Detector Phase	8	8		4	4		6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.6	10.6		10.6	10.6		25.6	25.6	25.6	14.6	14.6	14.6
Total Split (s)	34.0	34.0		34.0	34.0		56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	37.8%	37.8%		37.8%	37.8%		62.2%	62.2%	62.2%	62.2%	62.2%	62.2%
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	3.6
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)		4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min

### Intersection Summary






















Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated

### Splits and Phases: 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St



HCM 2010 Signalized Intersection Summary  
 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	18	221	245	114	39	166	376	211	6	364	516
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	63	19	233	258	120	41	175	396	222	6	383	543
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
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, %	2	2	2	2	2	2	3	3	3	3	3	3
Cap, veh/h	121	57	371	358	432	147	354	1057	892	522	1057	892
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.96	0.96	0.96	0.57	0.57	0.57
Sat Flow, veh/h	226	175	1141	1123	1329	454	595	1845	1557	792	1845	1557
Grp Volume(v), veh/h	315	0	0	258	0	161	175	396	222	6	383	543
Grp Sat Flow(s),veh/h/ln	1542	0	0	1123	0	1783	595	1845	1557	792	1845	1557
Q Serve(g_s), s	7.9	0.0	0.0	11.9	0.0	6.0	12.0	1.3	0.7	0.3	10.1	20.6
Cycle Q Clear(g_c), s	15.2	0.0	0.0	27.1	0.0	6.0	22.0	1.3	0.7	1.6	10.1	20.6
Prop In Lane	0.20		0.74	1.00		0.25	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	549	0	0	358	0	579	354	1057	892	522	1057	892
V/C Ratio(X)	0.57	0.00	0.00	0.72	0.00	0.28	0.49	0.37	0.25	0.01	0.36	0.61
Avail Cap(c_a), veh/h	552	0	0	360	0	582	354	1057	892	522	1057	892
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.87	0.87	0.87	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.5	0.0	0.0	31.7	0.0	22.6	3.6	0.9	0.8	8.8	10.4	12.6
Incr Delay (d2), s/veh	1.4	0.0	0.0	6.8	0.0	0.3	4.2	0.9	0.6	0.0	1.0	3.1
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(0%),veh/ln	6.8	0.0	0.0	6.9	0.0	3.0	2.3	0.8	0.4	0.1	5.4	9.5
LnGrp Delay(d),s/veh	26.9	0.0	0.0	38.5	0.0	22.8	7.8	1.7	1.4	8.9	11.3	15.7
LnGrp LOS	C			D		C	A	A	A	A	B	B
Approach Vol, veh/h		315			419			793			932	
Approach Delay, s/veh		26.9			32.5			3.0			13.8	
Approach LOS		C			C			A			B	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		56.2		33.8		56.2		33.8				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		51.4		29.4		51.4		29.4				
Max Q Clear Time (g_c+1), s		22.6		29.1		24.0		17.2				
Green Ext Time (p_c), s		9.2		0.1		9.1		2.5				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				15.2								
HCM 2010 LOS				B								

# Lanes, Volumes, Timings

## 4: E Main & SR 410 EB Ramps

1/21/2016

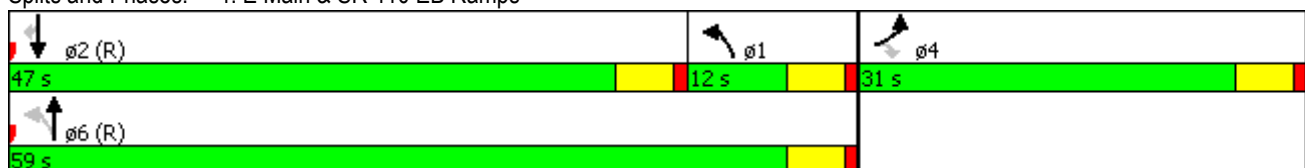


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	219	472	189	545	705	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75	0	175			75
Storage Lanes	1	1	1			1
Taper Length (ft)	50		50			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			35	35	
Link Distance (ft)	516			1317	642	
Travel Time (s)	11.7			25.7	12.5	
Confl. Peds. (#/hr)		7	1			1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		1	6	2	
Permitted Phases		4	6			2
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	15.0	15.0	15.0
Total Split (s)	31.0	31.0	12.0	59.0	47.0	47.0
Total Split (%)	34.4%	34.4%	13.3%	65.6%	52.2%	52.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max

### Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated













Splits and Phases: 4: E Main & SR 410 EB Ramps



# HCM 2010 Signalized Intersection Summary

## 4: E Main & SR 410 EB Ramps

1/21/2016

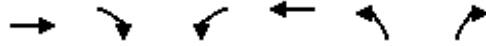
								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	219	472	189	545	705	136		
Number	7	14	1	6	2	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1845	1863	1863	1863	1863		
Adj Flow Rate, veh/h	226	286	195	562	727	0		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Percent Heavy Veh, %	3	3	2	2	2	2		
Cap, veh/h	377	337	424	1256	869	739		
Arrive On Green	0.21	0.21	0.15	0.67	0.47	0.00		
Sat Flow, veh/h	1757	1568	1774	1863	1863	1583		
Grp Volume(v), veh/h	226	286	195	562	727	0		
Grp Sat Flow(s),veh/h/ln	1757	1568	1774	1863	1863	1583		
Q Serve(g_s), s	10.4	15.8	0.6	12.7	30.7	0.0		
Cycle Q Clear(g_c), s	10.4	15.8	0.6	12.7	30.7	0.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	377	337	424	1256	869	739		
V/C Ratio(X)	0.60	0.85	0.46	0.45	0.84	0.00		
Avail Cap(c_a), veh/h	508	453	424	1256	869	739		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.82	0.00		
Uniform Delay (d), s/veh	31.8	33.9	30.6	6.8	21.0	0.0		
Incr Delay (d2), s/veh	1.8	11.7	0.8	1.2	7.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	5.2	7.9	4.2	6.8	17.6	0.0		
LnGrp Delay(d),s/veh	33.7	45.6	31.4	8.0	28.8	0.0		
LnGrp LOS	C	D	C	A	C			
Approach Vol, veh/h	512			757	727			
Approach Delay, s/veh	40.3			14.0	28.8			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	18.7	47.0		24.3		65.7		
Change Period (Y+Rc), s	5.0	5.0		5.0		5.0		
Max Green Setting (Gmax), s	7.0	42.0		26.0		54.0		
Max Q Clear Time (g_c+I1), s	2.6	32.7		17.8		14.7		
Green Ext Time (p_c), s	1.2	2.0		1.6		2.7		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			26.2					
HCM 2010 LOS			C					



# Lanes, Volumes, Timings

## 5: Shaw Rd & E Main

1/21/2016

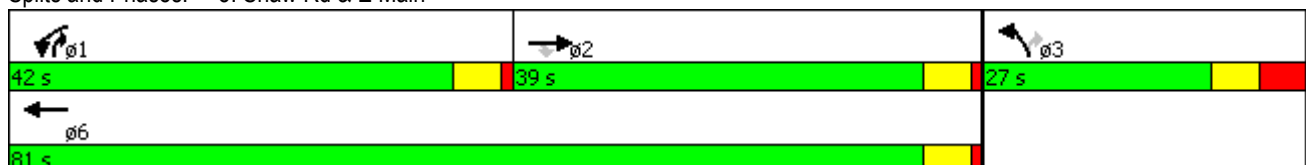


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖↗	↑	↖	↖↗
Volume (vph)	356	317	763	526	148	367
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		350	475		200	0
Storage Lanes		1	1		1	2
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	35	
Link Distance (ft)	488			1553	1499	
Travel Time (s)	9.5			30.3	29.2	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA	Perm	Prot	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases		2				3
Detector Phase	2	2	1	6	3	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	39.0	39.0	9.0	9.0	12.0	9.0
Total Split (s)	39.0	39.0	42.0	81.0	27.0	42.0
Total Split (%)	36.1%	36.1%	38.9%	75.0%	25.0%	38.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	4.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	8.0	5.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	None	None

### Intersection Summary

Area Type: Other  
 Cycle Length: 108  
 Actuated Cycle Length: 73.1  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Shaw Rd & E Main



# HCM 2010 Signalized Intersection Summary

## 5: Shaw Rd & E Main

1/21/2016

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↘↘	↑	↖	↗↗		
Volume (veh/h)	356	317	763	526	148	367		
Number	2	12	1	6	3	18		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1881	1881	1881	1881		
Adj Flow Rate, veh/h	383	170	820	566	159	191		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	1	1	1	1		
Cap, veh/h	902	403	1055	1211	240	1231		
Arrive On Green	0.25	0.25	0.30	0.64	0.13	0.13		
Sat Flow, veh/h	3632	1580	3476	1881	1792	2814		
Grp Volume(v), veh/h	383	170	820	566	159	191		
Grp Sat Flow(s),veh/h/ln	1770	1580	1738	1881	1792	1407		
Q Serve(g_s), s	5.3	5.3	12.6	9.0	4.9	2.4		
Cycle Q Clear(g_c), s	5.3	5.3	12.6	9.0	4.9	2.4		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	902	403	1055	1211	240	1231		
V/C Ratio(X)	0.42	0.42	0.78	0.47	0.66	0.16		
Avail Cap(c_a), veh/h	2056	918	2197	2443	582	1767		
HCM Platoon Ratio	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		
Uniform Delay (d), s/veh	18.2	18.2	18.6	5.3	24.1	9.9		
Incr Delay (d2), s/veh	0.3	0.7	1.3	0.3	3.1	0.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	2.6	2.4	6.2	4.7	2.6	0.9		
LnGrp Delay(d),s/veh	18.5	18.9	19.9	5.6	27.2	10.0		
LnGrp LOS	B	B	B	A	C	A		
Approach Vol, veh/h	553			1386	350			
Approach Delay, s/veh	18.7			14.0	17.8			
Approach LOS	B			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	22.8	19.9				42.7		15.9
Change Period (Y+Rc), s	5.0	5.0				5.0		8.0
Max Green Setting (Gmax), s	37.0	34.0				76.0		19.0
Max Q Clear Time (g_c+1), s	14.6	7.3				11.0		6.9
Green Ext Time (p_c), s	3.2	7.5				8.4		0.9

### Intersection Summary

HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

### Notes

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

Lanes, Volumes, Timings  
6: 15th St SE/15th St NE & E Main

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	511	265	210	406	133	72	78	119	135	114	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		100	200		100	0		0	0		65
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3360			2256			1179			404	
Travel Time (s)		76.4			51.3			26.8			9.2	
Confl. Peds. (#/hr)	6		3	3		6	3		3	3		3
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 (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
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		Yes			Yes							
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
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	2.0	3.0	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	
Minimum Split (s)	6.5	18.5	18.5	6.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	
Total Split (s)	34.5	49.5	49.5	34.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	
Total Split (%)	25.8%	37.1%	37.1%	25.8%	37.1%	37.1%	37.1%	37.1%	37.1%	37.1%	37.1%	
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	
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	
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	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	

Intersection Summary























Area Type: Other  
 Cycle Length: 133.5  
 Actuated Cycle Length: 65.7  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 6: 15th St SE/15th St NE & E Main

34.5 s	49.5 s	49.5 s
34.5 s	49.5 s	49.5 s

HCM 2010 Signalized Intersection Summary  
 6: 15th St SE/15th St NE & E Main

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	511	265	210	406	133	72	78	119	135	114	15
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	0.99		1.00	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1881	1900	1845	1845	1900	1881	1900
Adj Flow Rate, veh/h	11	527	273	216	419	137	74	80	0	139	118	15
Adj No. of Lanes	1	1	1	1	1	1	0	1	1	0	2	0
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, %	1	1	1	1	1	1	3	3	3	1	1	1
Cap, veh/h	483	755	639	475	954	806	210	169	295	390	319	42
Arrive On Green	0.01	0.40	0.40	0.11	0.51	0.51	0.19	0.19	0.00	0.19	0.19	0.19
Sat Flow, veh/h	1792	1881	1592	1792	1881	1590	492	897	1568	1278	1696	222
Grp Volume(v), veh/h	11	527	273	216	419	137	154	0	0	159	0	113
Grp Sat Flow(s),veh/h/ln	1792	1881	1592	1792	1881	1590	1389	0	1568	1525	0	1671
Q Serve(g_s), s	0.2	10.5	5.6	2.7	6.4	2.1	2.2	0.0	0.0	0.0	0.0	2.7
Cycle Q Clear(g_c), s	0.2	10.5	5.6	2.7	6.4	2.1	4.9	0.0	0.0	3.9	0.0	2.7
Prop In Lane	1.00		1.00	1.00		1.00	0.48		1.00	0.87		0.13
Lane Grp Cap(c), veh/h	483	755	639	475	954	806	379	0	295	436	0	315
V/C Ratio(X)	0.02	0.70	0.43	0.45	0.44	0.17	0.41	0.00	0.00	0.36	0.00	0.36
Avail Cap(c_a), veh/h	1661	1872	1584	1463	1872	1582	1581	0	1560	1545	0	1663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.0	11.3	9.8	7.6	7.1	6.0	16.8	0.0	0.0	16.5	0.0	16.0
Incr Delay (d2), s/veh	0.0	1.2	0.5	0.7	0.3	0.1	0.7	0.0	0.0	0.5	0.0	0.7
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(0%),veh/ln	0.1	5.7	2.5	1.3	3.3	0.9	1.8	0.0	0.0	1.8	0.0	1.3
LnGrp Delay(d),s/veh	8.0	12.4	10.2	8.3	7.4	6.1	17.5	0.0	0.0	17.0	0.0	16.7
LnGrp LOS	A	B	B	A	A	A	B			B		B
Approach Vol, veh/h		811			772			154			272	
Approach Delay, s/veh		11.6			7.4			17.5			16.9	
Approach LOS		B			A			B			B	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	22.6		13.0	4.8	27.4		13.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	30.0	45.0		45.0	30.0	45.0		45.0				
Max Q Clear Time (g_c+1), s	4.7	12.5		5.9	2.2	8.4		6.9				
Green Ext Time (p_c), s	0.7	5.6		1.5	0.0	5.7		1.5				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				11.2								
HCM 2010 LOS				B								

Lanes, Volumes, Timings  
7: 5th St SE/5th St NE & E Main

1/21/2016

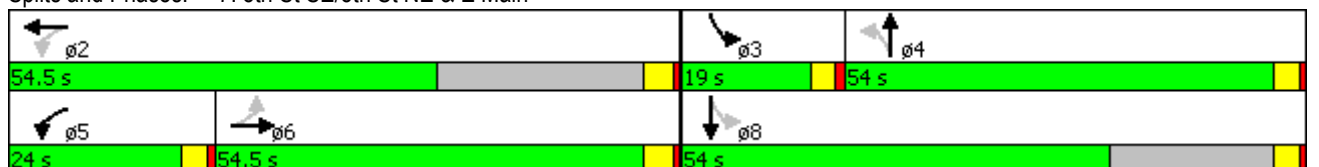


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	323	50	140	452	100	12	159	82	353	497	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	90		0	90		0	90		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		600			3360			543			901	
Travel Time (s)		16.4			76.4			12.3			20.5	
Confl. Peds. (#/hr)	2		3	3		2	2		1	1		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 (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
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		Yes			Yes							
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
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		6		5	2			4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		3	8	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	23.5	23.5		7.0	24.5		24.0	24.0		7.0	23.0	
Total Split (s)	54.5	54.5		24.0	54.5		54.0	54.0		19.0	54.0	
Total Split (%)	36.0%	36.0%		15.8%	36.0%		35.6%	35.6%		12.5%	35.6%	
Yellow Time (s)	3.5	3.5		3.0	3.5		3.0	3.0		3.0	3.0	
All-Red Time (s)	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		4.0	4.5		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?												
Recall Mode	Min	Min		None	Min		None	None		None	Max	

Intersection Summary





















Area Type: Other  
 Cycle Length: 151.5  
 Actuated Cycle Length: 102.4  
 Natural Cycle: 65  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 7: 5th St SE/5th St NE & E Main



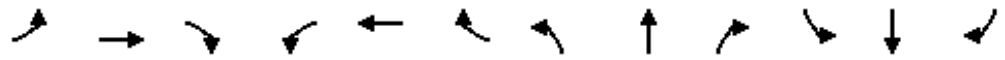
HCM 2010 Signalized Intersection Summary  
 7: 5th St SE/5th St NE & E Main

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	22	323	50	140	452	100	12	159	82	353	497	40
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1845	1845	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	23	333	52	144	466	103	12	164	85	364	512	41
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
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, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	165	426	67	288	573	127	346	383	199	592	893	72
Arrive On Green	0.27	0.27	0.27	0.08	0.39	0.39	0.33	0.33	0.33	0.15	0.52	0.52
Sat Flow, veh/h	839	1572	246	1757	1463	323	859	1167	605	1792	1719	138
Grp Volume(v), veh/h	23	0	385	144	0	569	12	0	249	364	0	553
Grp Sat Flow(s),veh/h/ln	839	0	1818	1757	0	1786	859	0	1772	1792	0	1857
Q Serve(g_s), s	2.4	0.0	18.8	5.4	0.0	27.3	0.9	0.0	10.6	12.3	0.0	19.6
Cycle Q Clear(g_c), s	18.1	0.0	18.8	5.4	0.0	27.3	2.1	0.0	10.6	12.3	0.0	19.6
Prop In Lane	1.00		0.14	1.00		0.18	1.00		0.34	1.00		0.07
Lane Grp Cap(c), veh/h	165	0	493	288	0	700	346	0	582	592	0	965
V/C Ratio(X)	0.14	0.00	0.78	0.50	0.00	0.81	0.03	0.00	0.43	0.62	0.00	0.57
Avail Cap(c_a), veh/h	374	0	945	514	0	928	511	0	921	603	0	965
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	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.4	0.0	32.4	23.4	0.0	26.1	22.8	0.0	25.2	16.4	0.0	15.8
Incr Delay (d2), s/veh	0.5	0.0	3.3	1.6	0.0	4.5	0.0	0.0	0.6	2.0	0.0	2.5
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(0%),veh/ln	0.6	0.0	9.9	2.7	0.0	14.3	0.2	0.0	5.3	6.3	0.0	10.6
LnGrp Delay(d),s/veh	39.8	0.0	35.7	25.0	0.0	30.6	22.9	0.0	25.9	18.4	0.0	18.3
LnGrp LOS	D		D	C		C	C		C	B		B
Approach Vol, veh/h		408			713			261			917	
Approach Delay, s/veh		36.0			29.5			25.7			18.3	
Approach LOS		D			C			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		42.2	18.4	35.6	11.6	30.6		54.0				
Change Period (Y+Rc), s		4.5	4.0	4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s		50.0	15.0	50.0	20.0	50.0		50.0				
Max Q Clear Time (g_c+1), s		29.3	14.3	12.6	7.4	20.8		21.6				
Green Ext Time (p_c), s		4.8	0.1	4.2	0.4	5.2		4.1				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			25.7									
HCM 2010 LOS			C									

Lanes, Volumes, Timings  
8: 2nd St NE & E Stewart St/E Main

1/21/2016

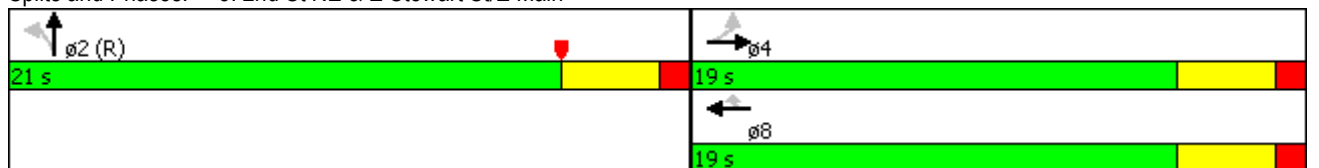


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗		↕				
Volume (vph)	49	312	0	0	318	202	112	667	1	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			25				25
Link Distance (ft)		388			193			477				917
Travel Time (s)		8.8			4.4			13.0				25.0
Confl. Peds. (#/hr)	12					12	8		6			
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 (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	0%	0%	0%
Shared Lane Traffic (%)												
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
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Detector Phase	4	4			8	8	2	2				
Switch Phase												
Minimum Initial (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Minimum Split (s)	18.6	18.6			18.6	18.6	18.6	18.6				
Total Split (s)	19.0	19.0			19.0	19.0	21.0	21.0				
Total Split (%)	47.5%	47.5%			47.5%	47.5%	52.5%	52.5%				
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0				
All-Red Time (s)	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				
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None	None	C-Min	C-Min				

Intersection Summary

















Area Type: Other  
 Cycle Length: 40  
 Actuated Cycle Length: 40  
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated

Splits and Phases: 8: 2nd St NE & E Stewart St/E Main



HCM 2010 Signalized Intersection Summary  
 8: 2nd St NE & E Stewart St/E Main

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	49	312	0	0	318	202	112	667	1	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1900	1845	1900			
Adj Flow Rate, veh/h	52	328	0	0	335	213	118	702	1			
Adj No. of Lanes	1	1	0	0	1	1	0	2	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	0	3	0			
Cap, veh/h	310	569	0	0	569	478	249	1561	2			
Arrive On Green	0.31	0.31	0.00	0.00	0.31	0.31	0.49	0.49	0.49			
Sat Flow, veh/h	852	1863	0	0	1863	1565	503	3156	5			
Grp Volume(v), veh/h	52	328	0	0	335	213	427	0	394			
Grp Sat Flow(s),veh/h/ln	852	1863	0	0	1863	1565	1820	0	1844			
Q Serve(g_s), s	2.2	5.9	0.0	0.0	6.1	4.4	6.2	0.0	5.5			
Cycle Q Clear(g_c), s	8.3	5.9	0.0	0.0	6.1	4.4	6.2	0.0	5.5			
Prop In Lane	1.00		0.00	0.00		1.00	0.28		0.00			
Lane Grp Cap(c), veh/h	310	569	0	0	569	478	900	0	912			
V/C Ratio(X)	0.17	0.58	0.00	0.00	0.59	0.45	0.47	0.00	0.43			
Avail Cap(c_a), veh/h	370	699	0	0	699	587	900	0	912			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.59	0.59	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	15.3	11.7	0.0	0.0	11.8	11.2	6.7	0.0	6.5			
Incr Delay (d2), s/veh	0.1	0.6	0.0	0.0	1.0	0.7	1.8	0.0	1.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(0%),veh/ln	0.5	3.1	0.0	0.0	3.2	2.0	3.5	0.0	3.1			
LnGrp Delay(d),s/veh	15.4	12.3	0.0	0.0	12.7	11.8	8.5	0.0	8.0			
LnGrp LOS	B	B			B	B	A		A			
Approach Vol, veh/h		380			548			821				
Approach Delay, s/veh		12.7			12.4			8.2				
Approach LOS		B			B			A				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		23.8		16.2				16.2				
Change Period (Y+Rc), s		4.0		4.0				4.0				
Max Green Setting (Gmax), s		17.0		15.0				15.0				
Max Q Clear Time (g_c+1), s		8.2		10.3				8.1				
Green Ext Time (p_c), s		2.1		1.7				2.1				

Intersection Summary

HCM 2010 Ctrl Delay	10.5
HCM 2010 LOS	B

Notes

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



Lanes, Volumes, Timings  
 9: N Meridian & W Stewart St/E Stewart St

1/21/2016

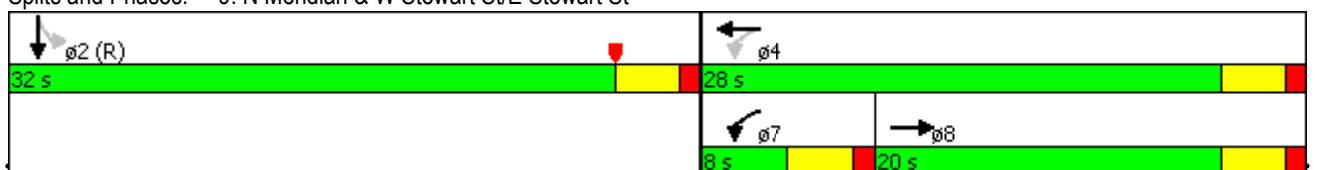


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↖						↖↗	
Volume (vph)	0	220	81	115	300	0	0	0	0	152	947	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1361			388			473			896	
Travel Time (s)		37.1			10.6			12.9			24.4	
Confl. Peds. (#/hr)			19	19						10		18
Confl. Bikes (#/hr)			3									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 (%)	3%	3%	3%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Shared Lane Traffic (%)												
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
Turn Type		NA		pm+pt		NA				Perm		NA
Protected Phases		8		7	4							2
Permitted Phases				4						2		
Detector Phase		8		7	4					2		2
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0		4.0
Minimum Split (s)		20.0		8.0	20.0					20.0		20.0
Total Split (s)		20.0		8.0	28.0					32.0		32.0
Total Split (%)		33.3%		13.3%	46.7%					53.3%		53.3%
Yellow Time (s)		3.0		3.0	3.0					3.0		3.0
All-Red Time (s)		1.0		1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		4.0		4.0	4.0					4.0		4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Recall Mode		None		None	None					C-Min		C-Min

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:, Start of Yellow  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Splits and Phases: 9: N Meridian & W Stewart St/E Stewart St



HCM 2010 Signalized Intersection Summary  
 9: N Meridian & W Stewart St/E Stewart St

1/21/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	220	81	115	300	0	0	0	0	152	947	69
Number	3	8	18	7	4	14				5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	1863	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	234	70	122	319	0				162	1007	70
Adj No. of Lanes	0	1	0	1	1	0				0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	3	3	2	2	0				0	2	0
Cap, veh/h	0	307	92	307	671	0				231	1509	110
Arrive On Green	0.00	0.23	0.23	0.07	0.36	0.00				0.51	0.51	0.51
Sat Flow, veh/h	0	1350	404	1774	1863	0				457	2981	217
Grp Volume(v), veh/h	0	0	304	122	319	0				653	0	586
Grp Sat Flow(s),veh/h/ln	0	0	1754	1774	1863	0				1840	0	1814
Q Serve(g_s), s	0.0	0.0	9.7	3.0	7.9	0.0				16.3	0.0	14.1
Cycle Q Clear(g_c), s	0.0	0.0	9.7	3.0	7.9	0.0				16.3	0.0	14.1
Prop In Lane	0.00		0.23	1.00		0.00				0.25		0.12
Lane Grp Cap(c), veh/h	0	0	398	307	671	0				932	0	919
V/C Ratio(X)	0.00	0.00	0.76	0.40	0.48	0.00				0.70	0.00	0.64
Avail Cap(c_a), veh/h	0	0	468	307	745	0				932	0	919
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.77	0.77	0.00				0.92	0.00	0.92
Uniform Delay (d), s/veh	0.0	0.0	21.7	15.9	14.8	0.0				11.3	0.0	10.8
Incr Delay (d2), s/veh	0.0	0.0	6.2	0.6	0.4	0.0				4.1	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.0	0.0	5.3	1.5	4.2	0.0				9.2	0.0	7.8
LnGrp Delay(d),s/veh	0.0	0.0	27.9	16.5	15.2	0.0				15.4	0.0	13.9
LnGrp LOS			C	B	B					B		B
Approach Vol, veh/h		304			441						1239	
Approach Delay, s/veh		27.9			15.6						14.7	
Approach LOS		C			B						B	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		34.4		25.6			8.0	17.6				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		28.0		24.0			4.0	16.0				
Max Q Clear Time (g_c+I1), s		18.3		9.9			5.0	11.7				
Green Ext Time (p_c), s		3.7		1.9			0.0	1.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				16.9								
HCM 2010 LOS				B								

# Lanes, Volumes, Timings

## 10: 5th St SW & W Pioneer

1/21/2016

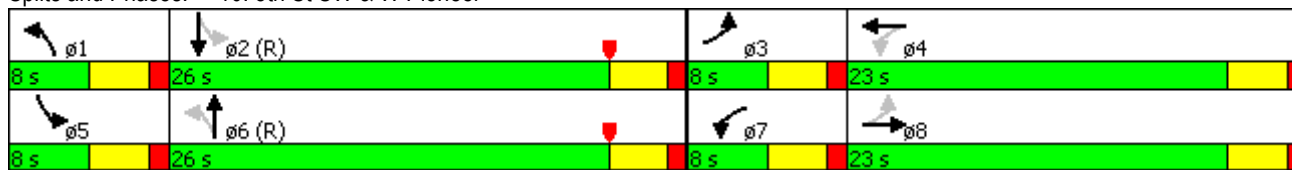


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	320	64	47	421	20	79	362	29	39	397	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	85		0	100		0	100		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		2667			1336			1545			188	
Travel Time (s)		60.6			36.4			35.1			4.3	
Confl. Peds. (#/hr)	4		6	6		4	11		7	7		11
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
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
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.0	22.0		8.0	22.0		8.0	22.0		8.0	23.0	
Total Split (s)	8.0	23.0		8.0	23.0		8.0	26.0		8.0	26.0	
Total Split (%)	12.3%	35.4%		12.3%	35.4%		12.3%	40.0%		12.3%	40.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	

### Intersection Summary





















Area Type: Other  
 Cycle Length: 65  
 Actuated Cycle Length: 65  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Splits and Phases: 10: 5th St SW & W Pioneer



HCM 2010 Signalized Intersection Summary  
10: 5th St SW & W Pioneer

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	95	320	64	47	421	20	79	362	29	39	397	135
Number	3	8	18	7	4	14	1	6	16	5	2	12
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	1.00		0.99	1.00		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1845	1845	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	99	333	67	49	439	21	82	377	30	41	414	141
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	246	451	91	272	484	23	267	656	52	372	491	167
Arrive On Green	0.06	0.30	0.30	0.04	0.28	0.28	0.05	0.39	0.39	0.03	0.37	0.37
Sat Flow, veh/h	1774	1504	303	1757	1745	83	1774	1701	135	1774	1324	451
Grp Volume(v), veh/h	99	0	400	49	0	460	82	0	407	41	0	555
Grp Sat Flow(s),veh/h/ln	1774	0	1807	1757	0	1829	1774	0	1837	1774	0	1775
Q Serve(g_s), s	2.6	0.0	12.9	1.3	0.0	15.8	1.8	0.0	11.4	0.9	0.0	18.6
Cycle Q Clear(g_c), s	2.6	0.0	12.9	1.3	0.0	15.8	1.8	0.0	11.4	0.9	0.0	18.6
Prop In Lane	1.00		0.17	1.00		0.05	1.00		0.07	1.00		0.25
Lane Grp Cap(c), veh/h	246	0	542	272	0	508	267	0	708	372	0	658
V/C Ratio(X)	0.40	0.00	0.74	0.18	0.00	0.91	0.31	0.00	0.57	0.11	0.00	0.84
Avail Cap(c_a), veh/h	252	0	542	316	0	535	291	0	708	425	0	658
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)	0.19	0.00	0.19	0.80	0.00	0.80	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	20.5	16.8	0.0	22.7	14.5	0.0	15.8	12.7	0.0	18.7
Incr Delay (d2), s/veh	0.2	0.0	1.1	0.3	0.0	15.6	0.6	0.0	3.4	0.1	0.0	12.6
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(0%),veh/ln	1.2	0.0	6.6	0.6	0.0	10.1	0.9	0.0	6.4	0.4	0.0	11.4
LnGrp Delay(d),s/veh	17.5	0.0	21.5	17.1	0.0	38.2	15.1	0.0	19.1	12.9	0.0	31.3
LnGrp LOS	B		C	B		D	B		B	B		C
Approach Vol, veh/h		499			509			489			596	
Approach Delay, s/veh		20.7			36.2			18.5			30.0	
Approach LOS		C			D			B			C	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	28.1	7.8	22.0	6.1	29.1	6.3	23.5				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	22.0	4.0	19.0	4.0	22.0	4.0	19.0				
Max Q Clear Time (g_c+1), s	3.8	20.6	4.6	17.8	2.9	13.4	3.3	14.9				
Green Ext Time (p_c), s	0.0	0.6	0.0	0.3	0.0	2.6	0.0	1.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			26.6									
HCM 2010 LOS			C									

# Lanes, Volumes, Timings

## 11: S Meridian & W Pioneer/E Pioneer

1/21/2016

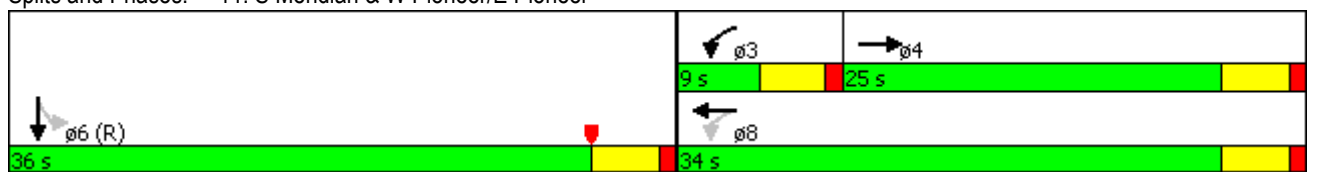


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔↔	
Volume (vph)	0	280	63	117	361	0	0	0	0	125	888	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1336			594			1560			189	
Travel Time (s)		36.4			16.2			42.5			5.2	
Confl. Peds. (#/hr)			4	4		8				4		31
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%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Shared Lane Traffic (%)												
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
Turn Type		NA		pm+pt	NA					Perm		NA
Protected Phases		4		3	8							6
Permitted Phases				8						6		
Detector Phase		4		3	8					6		6
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0		4.0
Minimum Split (s)		23.6		9.0	23.6					23.6		23.6
Total Split (s)		25.0		9.0	34.0					36.0		36.0
Total Split (%)		35.7%		12.9%	48.6%					51.4%		51.4%
Yellow Time (s)		3.6		3.6	3.6					3.6		3.6
All-Red Time (s)		1.0		1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		4.6		4.6	4.6					4.6		4.6
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Recall Mode		None		None	None					C-Max		C-Max

### Intersection Summary


















Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Yellow  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Splits and Phases: 11: S Meridian & W Pioneer/E Pioneer



HCM 2010 Signalized Intersection Summary  
 11: S Meridian & W Pioneer/E Pioneer

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	280	63	117	361	0	0	0	0	125	888	109
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				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
Adj Sat Flow, veh/h/ln	0	1881	1900	1900	1900	1900				1900	1881	1900
Adj Flow Rate, veh/h	0	298	57	124	384	0				133	945	112
Adj No. of Lanes	0	1	0	1	1	0				0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	1	1	0	0	0				0	1	0
Cap, veh/h	0	359	69	268	688	0				176	1305	162
Arrive On Green	0.00	0.23	0.23	0.06	0.36	0.00				0.45	0.45	0.45
Sat Flow, veh/h	0	1534	293	1810	1900	0				392	2910	362
Grp Volume(v), veh/h	0	0	355	124	384	0				632	0	558
Grp Sat Flow(s),veh/h/ln	0	0	1828	1810	1900	0				1862	0	1802
Q Serve(g_s), s	0.0	0.0	12.9	3.5	11.3	0.0				19.8	0.0	17.3
Cycle Q Clear(g_c), s	0.0	0.0	12.9	3.5	11.3	0.0				19.8	0.0	17.3
Prop In Lane	0.00		0.16	1.00		0.00				0.21		0.20
Lane Grp Cap(c), veh/h	0	0	427	268	688	0				835	0	808
V/C Ratio(X)	0.00	0.00	0.83	0.46	0.56	0.00				0.76	0.00	0.69
Avail Cap(c_a), veh/h	0	0	533	268	798	0				835	0	808
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.71	0.48	0.48	0.00				0.92	0.00	0.92
Uniform Delay (d), s/veh	0.0	0.0	25.5	18.9	17.8	0.0				16.1	0.0	15.4
Incr Delay (d2), s/veh	0.0	0.0	6.5	0.6	0.3	0.0				5.9	0.0	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.0	0.0	7.3	1.7	5.9	0.0				11.4	0.0	9.5
LnGrp Delay(d),s/veh	0.0	0.0	32.0	19.5	18.2	0.0				22.0	0.0	19.8
LnGrp LOS			C	B	B					C		B
Approach Vol, veh/h		355			508						1190	
Approach Delay, s/veh		32.0			18.5						21.0	
Approach LOS		C			B						C	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.0	21.0		36.0		30.0				
Change Period (Y+Rc), s			4.6	4.6		4.6		4.6				
Max Green Setting (Gmax), s			4.4	20.4		31.4		29.4				
Max Q Clear Time (g_c+1), s			5.5	14.9		21.8		13.3				
Green Ext Time (p_c), s			0.0	1.4		3.5		2.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			22.3									
HCM 2010 LOS			C									

# Lanes, Volumes, Timings

## 12: 3rd St SE & E Pioneer

1/21/2016

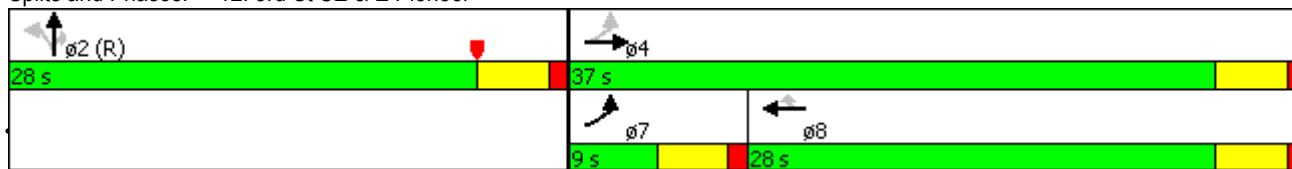


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	386	0	0	469	190	46	468	100	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			2%			2%			0%	
Storage Length (ft)	100		0	0		0	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		594			701			1281			183	
Travel Time (s)		16.2			19.1			34.9			5.0	
Confl. Peds. (#/hr)	5		6			5	2		6			
Confl. Bikes (#/hr)									1			
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 (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
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	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Minimum Split (s)	9.0	24.6			24.6	24.6	26.6	26.6	26.6			
Total Split (s)	9.0	37.0			28.0	28.0	28.0	28.0	28.0			
Total Split (%)	13.8%	56.9%			43.1%	43.1%	43.1%	43.1%	43.1%			
Yellow Time (s)	3.6	3.6			3.6	3.6	3.6	3.6	3.6			
All-Red Time (s)	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			
Total Lost Time (s)	4.6	4.6			4.6	4.6		4.6	4.6			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	None			None	None	C-Max	C-Max	C-Max			

### Intersection Summary

Area Type: Other  
 Cycle Length: 65  
 Actuated Cycle Length: 65  
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Splits and Phases: 12: 3rd St SE & E Pioneer





















2016 Existing - PM Peak Hour

Dynamic Report

HCM 2010 Signalized Intersection Summary  
 12: 3rd St SE & E Pioneer

1/21/2016

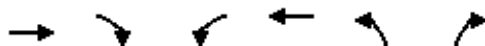
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	57	386	0	0	469	190	46	468	100	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1862	1862	0	0	1881	1881	1881	1881	1881			
Adj Flow Rate, veh/h	59	398	0	0	484	196	47	482	103			
Adj No. of Lanes	1	1	0	0	1	1	0	2	1			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	0	0	0	0	0			
Cap, veh/h	232	776	0	0	575	486	137	1476	687			
Arrive On Green	0.04	0.42	0.00	0.00	0.31	0.31	0.44	0.44	0.44			
Sat Flow, veh/h	1774	1862	0	0	1881	1591	310	3342	1555			
Grp Volume(v), veh/h	59	398	0	0	484	196	283	246	103			
Grp Sat Flow(s),veh/h/ln	1774	1862	0	0	1881	1591	1865	1787	1555			
Q Serve(g_s), s	1.4	10.3	0.0	0.0	15.6	6.3	6.5	5.8	2.6			
Cycle Q Clear(g_c), s	1.4	10.3	0.0	0.0	15.6	6.3	6.5	5.8	2.6			
Prop In Lane	1.00		0.00	0.00		1.00	0.17		1.00			
Lane Grp Cap(c), veh/h	232	776	0	0	575	486	824	789	687			
V/C Ratio(X)	0.25	0.51	0.00	0.00	0.84	0.40	0.34	0.31	0.15			
Avail Cap(c_a), veh/h	280	928	0	0	677	573	824	789	687			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.54	0.54	0.00	0.00	0.94	0.94	1.00	1.00	1.00			
Uniform Delay (d), s/veh	15.7	14.1	0.0	0.0	21.1	17.9	11.9	11.7	10.8			
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.0	7.8	0.5	1.1	1.0	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			
%ile BackOfQ(0%),veh/ln	0.7	5.4	0.0	0.0	9.3	2.8	3.6	3.0	1.2			
LnGrp Delay(d),s/veh	16.0	14.3	0.0	0.0	28.9	18.4	13.1	12.8	11.3			
LnGrp LOS	B	B			C	B	B	B	B			
Approach Vol, veh/h		457			680			632				
Approach Delay, s/veh		14.6			25.9			12.7				
Approach LOS		B			C			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		33.3		31.7			7.2	24.5				
Change Period (Y+Rc), s		4.6		4.6			4.6	4.6				
Max Green Setting (Gmax), s		23.4		32.4			4.4	23.4				
Max Q Clear Time (g_c+1), s		8.5		12.3			3.4	17.6				
Green Ext Time (p_c), s		2.0		4.0			0.0	2.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				18.2								
HCM 2010 LOS				B								



# Lanes, Volumes, Timings

## 13: SR 512 WB Ramps & E Pioneer

1/21/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Volume (vph)	529	302	299	490	132	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	236
Storage Lanes		0	1		1	1
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	30	
Link Distance (ft)	334			803	571	
Travel Time (s)	6.5			15.6	13.0	
Confl. Peds. (#/hr)		7				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
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)		9	15		15	9
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases						4
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	8.0		6.0	8.0	8.0	8.0
Minimum Split (s)	27.5		10.5	12.5	12.5	12.5
Total Split (s)	28.0		19.0	47.0	13.0	13.0
Total Split (%)	46.7%		31.7%	78.3%	21.7%	21.7%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min		None	C-Min	None	None

### Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated












Splits and Phases: 13: SR 512 WB Ramps & E Pioneer



# HCM 2010 Signalized Intersection Summary

## 13: SR 512 WB Ramps & E Pioneer

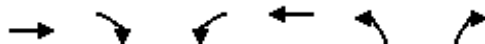
1/21/2016

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Volume (veh/h)	529	302	299	490	132	55		
Number	6	16	5	2	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1900	1881	1881	1863	1863		
Adj Flow Rate, veh/h	551	315	311	510	138	0		
Adj No. of Lanes	2	0	1	2	1	1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		
Percent Heavy Veh, %	1	1	1	1	2	2		
Cap, veh/h	987	564	365	2609	213	190		
Arrive On Green	0.45	0.45	0.20	0.73	0.12	0.00		
Sat Flow, veh/h	2281	1249	1792	3668	1774	1583		
Grp Volume(v), veh/h	450	416	311	510	138	0		
Grp Sat Flow(s),veh/h/ln	1787	1649	1792	1787	1774	1583		
Q Serve(g_s), s	11.1	11.1	10.0	2.7	4.5	0.0		
Cycle Q Clear(g_c), s	11.1	11.1	10.0	2.7	4.5	0.0		
Prop In Lane		0.76	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	806	744	365	2609	213	190		
V/C Ratio(X)	0.56	0.56	0.85	0.20	0.65	0.00		
Avail Cap(c_a), veh/h	806	744	433	2609	251	224		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.95	0.95	1.00	0.00		
Uniform Delay (d), s/veh	12.1	12.1	23.0	2.6	25.2	0.0		
Incr Delay (d2), s/veh	2.8	3.0	12.7	0.2	5.0	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	6.0	5.6	6.2	1.3	2.5	0.0		
LnGrp Delay(d),s/veh	14.9	15.1	35.7	2.7	30.2	0.0		
LnGrp LOS	B	B	D	A	C			
Approach Vol, veh/h	866			821	138			
Approach Delay, s/veh	15.0			15.2	30.2			
Approach LOS	B			B	C			
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		48.3		11.7	16.7	31.6		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		42.5		8.5	14.5	23.5		
Max Q Clear Time (g_c+I1), s		4.7		6.5	12.0	13.1		
Green Ext Time (p_c), s		5.9		0.1	0.3	4.1		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			16.2					
HCM 2010 LOS			B					

# Lanes, Volumes, Timings

## 14: SR 512 EB Ramps & E Pioneer

1/21/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	↗
Volume (vph)	459	124	52	638	145	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	170		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	30	
Link Distance (ft)	803			1011	357	
Travel Time (s)	15.6			19.7	8.1	
Confl. Peds. (#/hr)		8				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
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)		9	15		15	9
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases						4
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	8.0		6.0	8.0	8.0	8.0
Minimum Split (s)	28.5		10.6	12.6	12.6	12.6
Total Split (s)	29.0		10.6	39.6	15.4	15.4
Total Split (%)	52.7%		19.3%	72.0%	28.0%	28.0%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min		None	C-Min	None	None

### Intersection Summary

Area Type: Other  
 Cycle Length: 55  
 Actuated Cycle Length: 55  
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated

Splits and Phases: 14: SR 512 EB Ramps & E Pioneer



HCM 2010 Signalized Intersection Summary  
 14: SR 512 EB Ramps & E Pioneer

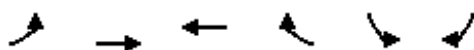
1/21/2016

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑		↘	↑↑	↘	↗		
Volume (veh/h)	459	124	52	638	145	249		
Number	6	16	5	2	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1900	1881	1881	1863	1863		
Adj Flow Rate, veh/h	494	133	56	686	156	208		
Adj No. of Lanes	2	0	1	2	1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	1	1	2	2		
Cap, veh/h	1445	387	112	2390	298	266		
Arrive On Green	0.52	0.52	0.06	0.67	0.17	0.17		
Sat Flow, veh/h	2851	738	1792	3668	1774	1583		
Grp Volume(v), veh/h	316	311	56	686	156	208		
Grp Sat Flow(s),veh/h/ln	1770	1726	1792	1787	1774	1583		
Q Serve(g_s), s	5.7	5.8	1.7	4.3	4.4	6.9		
Cycle Q Clear(g_c), s	5.7	5.8	1.7	4.3	4.4	6.9		
Prop In Lane		0.43	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	927	904	112	2390	298	266		
V/C Ratio(X)	0.34	0.34	0.50	0.29	0.52	0.78		
Avail Cap(c_a), veh/h	927	904	199	2390	352	314		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.83	0.83	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	7.6	7.6	24.9	3.7	20.9	21.9		
Incr Delay (d2), s/veh	0.8	0.9	3.4	0.3	1.7	11.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	2.9	2.9	0.9	2.2	2.3	6.6		
LnGrp Delay(d),s/veh	8.4	8.5	28.3	4.0	22.6	33.0		
LnGrp LOS	A	A	C	A	C	C		
Approach Vol, veh/h	627			742	364			
Approach Delay, s/veh	8.4			5.9	28.5			
Approach LOS	A			A	C			
<b>Timer</b>	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.3		13.7	7.9	33.3		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		35.1		10.9	6.1	24.5		
Max Q Clear Time (g_c+1), s		6.3		8.9	3.7	7.8		
Green Ext Time (p_c), s		7.0		0.3	0.0	5.9		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			11.6					
HCM 2010 LOS			B					

# Lanes, Volumes, Timings

## 15: E Pioneer & 15th St SE

1/21/2016

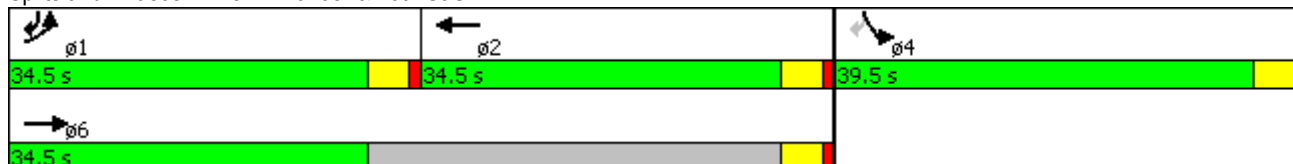


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	197	488	419	101	235	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		30	
Link Distance (ft)		838	468		1179	
Travel Time (s)		16.3	9.1		26.8	
Confl. Peds. (#/hr)					11	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		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	15	9
Turn Type	Prot	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases						4
Detector Phase	1	6	2		4	1
Switch Phase						
Minimum Initial (s)	3.0	3.0	3.0		3.0	3.0
Minimum Split (s)	7.5	7.5	30.5		24.5	7.5
Total Split (s)	34.5	34.5	34.5		39.5	34.5
Total Split (%)	31.8%	31.8%	31.8%		36.4%	31.8%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?						
Recall Mode	None	Min	Min		None	None

### Intersection Summary

Area Type: Other  
 Cycle Length: 108.5  
 Actuated Cycle Length: 56.7  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 15: E Pioneer & 15th St SE



# HCM 2010 Signalized Intersection Summary

## 15: E Pioneer & 15th St SE

1/21/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Volume (veh/h)	197	488	419	101	235	312		
Number	1	6	2	12	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1881	1900	1881	1881		
Adj Flow Rate, veh/h	201	498	428	103	240	318		
Adj No. of Lanes	1	2	2	0	1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98		
Percent Heavy Veh, %	2	2	1	1	1	1		
Cap, veh/h	273	1883	771	184	448	831		
Arrive On Green	0.15	0.53	0.27	0.27	0.25	0.25		
Sat Flow, veh/h	1774	3632	2958	684	1792	1599		
Grp Volume(v), veh/h	201	498	266	265	240	318		
Grp Sat Flow(s),veh/h/ln	1774	1770	1787	1761	1792	1599		
Q Serve(g_s), s	4.5	3.2	5.3	5.4	4.8	4.9		
Cycle Q Clear(g_c), s	4.5	3.2	5.3	5.4	4.8	4.9		
Prop In Lane	1.00			0.39	1.00	1.00		
Lane Grp Cap(c), veh/h	273	1883	481	474	448	831		
V/C Ratio(X)	0.74	0.26	0.55	0.56	0.54	0.38		
Avail Cap(c_a), veh/h	1287	2569	1297	1278	1517	1784		
HCM Platoon Ratio	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		
Uniform Delay (d), s/veh	16.7	5.3	13.0	13.0	13.4	6.0		
Incr Delay (d2), s/veh	3.8	0.1	1.0	1.0	1.4	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	2.5	1.5	2.7	2.7	2.5	3.5		
LnGrp Delay(d),s/veh	20.5	5.3	14.0	14.0	14.8	6.4		
LnGrp LOS	C	A	B	B	B	A		
Approach Vol, veh/h		699	531		558			
Approach Delay, s/veh		9.7	14.0		10.0			
Approach LOS		A	B		B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	10.9	15.6		14.8		26.5		
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		
Max Green Setting (Gmax), s	30.0	30.0		35.0		30.0		
Max Q Clear Time (g_c+1), s	6.5	7.4		6.9		5.2		
Green Ext Time (p_c), s	0.6	3.8		3.4		3.8		

### Intersection Summary

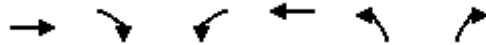
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B

### Notes

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

Lanes, Volumes, Timings  
16: 21st St SE & E Pioneer

1/21/2016

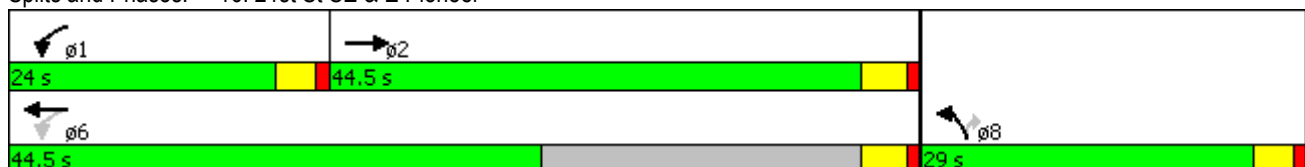


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Volume (vph)	633	55	72	520	47	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		150	0
Storage Lanes		0	0		1	1
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	25	
Link Distance (ft)	1383			1343	450	
Travel Time (s)	26.9			26.2	12.3	
Confl. Peds. (#/hr)		3	3			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	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)		9	15		15	9
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	8.0		12.0	8.0	4.0	4.0
Minimum Split (s)	24.5		16.0	12.5	8.0	8.0
Total Split (s)	44.5		24.0	44.5	29.0	29.0
Total Split (%)	45.6%		24.6%	45.6%	29.7%	29.7%
Yellow Time (s)	3.5		3.0	3.5	3.0	3.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.0	4.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	Min		None	Min	None	None

Intersection Summary

Area Type: Other  
 Cycle Length: 97.5  
 Actuated Cycle Length: 34.3  
 Natural Cycle: 50  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 16: 21st St SE & E Pioneer



# HCM 2010 Signalized Intersection Summary

## 16: 21st St SE & E Pioneer

1/21/2016

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑			↑↑	↖	↗		
Volume (veh/h)	633	55	72	520	47	71		
Number	2	12	1	6	3	18		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1900	1900	1881	1900	1900		
Adj Flow Rate, veh/h	659	57	75	542	49	0		
Adj No. of Lanes	2	0	0	2	1	1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		
Percent Heavy Veh, %	1	1	1	1	0	0		
Cap, veh/h	2252	195	150	1461	81	72		
Arrive On Green	0.68	0.68	0.68	0.68	0.04	0.00		
Sat Flow, veh/h	3423	288	2	2246	1810	1615		
Grp Volume(v), veh/h	353	363	292	325	49	0		
Grp Sat Flow(s),veh/h/ln	1787	1830	535	1627	1810	1615		
Q Serve(g_s), s	2.4	2.4	9.8	2.5	0.8	0.0		
Cycle Q Clear(g_c), s	2.4	2.4	9.8	2.5	0.8	0.0		
Prop In Lane		0.16	0.26		1.00	1.00		
Lane Grp Cap(c), veh/h	1209	1237	0	1100	81	72		
V/C Ratio(X)	0.29	0.29	0.00	0.30	0.61	0.00		
Avail Cap(c_a), veh/h	2347	2403	0	2137	1485	1326		
HCM Platoon Ratio	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	0.00		
Uniform Delay (d), s/veh	2.0	2.0	0.0	2.0	14.3	0.0		
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.2	7.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	1.2	1.3	0.0	1.1	0.6	0.0		
LnGrp Delay(d),s/veh	2.2	2.2	0.0	2.2	21.5	0.0		
LnGrp LOS	A	A		A	C			
Approach Vol, veh/h	716			617	49			
Approach Delay, s/veh	2.2			1.2	21.5			
Approach LOS	A			A	C			
<b>Timer</b>	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		25.1				25.1		5.4
Change Period (Y+Rc), s		4.5				4.5		4.0
Max Green Setting (Gmax), s		40.0				40.0		25.0
Max Q Clear Time (g_c+I1), s		4.4				11.8		2.8
Green Ext Time (p_c), s		9.4				8.8		0.1
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			2.4					
HCM 2010 LOS			A					



# Lanes, Volumes, Timings

## 17: Shaw Rd & E Pioneer

1/21/2016

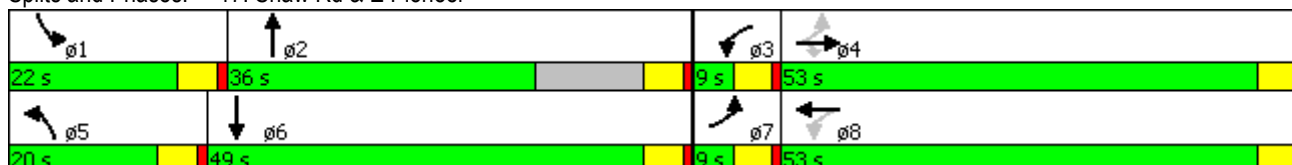


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	319	320	119	220	48	153	370	55	145	817	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	250		0	450		0
Storage Lanes	1		1	1		0	2		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1445			1301			1580			893	
Travel Time (s)		28.1			25.3			30.8			17.4	
Confl. Peds. (#/hr)												1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
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			24			24	
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
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8								
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	42.0	42.0	9.0	52.0		9.0	35.0		9.0	38.0	
Total Split (s)	9.0	53.0	53.0	9.0	53.0		20.0	36.0		22.0	49.0	
Total Split (%)	6.9%	40.5%	40.5%	6.9%	40.5%		15.3%	27.5%		16.8%	37.4%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	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)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		None	Min	

### Intersection Summary

Area Type: Other  
 Cycle Length: 131  
 Actuated Cycle Length: 90  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated























### Splits and Phases: 17: Shaw Rd & E Pioneer



# HCM 2010 Signalized Intersection Summary

## 17: Shaw Rd & E Pioneer

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	74	319	320	119	220	48	153	370	55	145	817	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	77	332	250	124	229	50	159	385	57	151	851	117
Adj No. of Lanes	1	1	1	1	1	0	2	2	0	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	285	434	369	241	352	77	252	1088	160	191	1207	166
Arrive On Green	0.05	0.23	0.23	0.05	0.24	0.24	0.07	0.35	0.35	0.11	0.38	0.38
Sat Flow, veh/h	1774	1863	1583	1774	1482	324	3476	3128	460	1792	3157	434
Grp Volume(v), veh/h	77	332	250	124	0	279	159	219	223	151	482	486
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1806	1738	1787	1800	1792	1787	1804
Q Serve(g_s), s	2.5	12.8	11.0	4.0	0.0	10.7	3.4	7.0	7.1	6.3	17.5	17.5
Cycle Q Clear(g_c), s	2.5	12.8	11.0	4.0	0.0	10.7	3.4	7.0	7.1	6.3	17.5	17.5
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.26	1.00		0.24
Lane Grp Cap(c), veh/h	285	434	369	241	0	429	252	622	626	191	683	690
V/C Ratio(X)	0.27	0.77	0.68	0.51	0.00	0.65	0.63	0.35	0.36	0.79	0.70	0.70
Avail Cap(c_a), veh/h	294	1164	989	241	0	1128	679	721	727	397	1024	1034
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	27.5	26.8	22.7	0.0	26.4	34.6	18.6	18.6	33.5	20.1	20.1
Incr Delay (d2), s/veh	0.5	2.9	2.2	1.9	0.0	1.7	2.6	0.3	0.3	7.1	1.3	1.3
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(0%),veh/ln	1.3	6.9	5.0	2.1	0.0	5.5	1.7	3.5	3.6	3.5	8.8	8.9
LnGrp Delay(d),s/veh	22.1	30.4	29.0	24.6	0.0	28.1	37.2	18.9	19.0	40.5	21.4	21.4
LnGrp LOS	C	C	C	C		C	D	B	B	D	C	C
Approach Vol, veh/h		659			403			601			1119	
Approach Delay, s/veh		28.9			27.0			23.8			24.0	
Approach LOS		C			C			C			C	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.2	31.7	9.0	22.9	10.6	34.4	8.6	23.2				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	17.0	31.0	4.0	48.0	15.0	44.0	4.0	48.0				
Max Q Clear Time (g_c+1), s	8.3	9.1	6.0	14.8	5.4	19.5	4.5	12.7				
Green Ext Time (p_c), s	0.2	9.4	0.0	3.1	0.3	9.8	0.0	3.1				

### Intersection Summary

HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

### Notes

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

# Lanes, Volumes, Timings

## 18: SR-162 (Orting Hwy) & Pioneer Way E/Bowman Hilton Rd

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↕		↖	↕	
Volume (vph)	74	14	333	5	7	19	185	343	2	24	757	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	400		0	225		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			25			35			35	
Link Distance (ft)		3040			392			769			482	
Travel Time (s)		59.2			10.7			15.0			9.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	1%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
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								Yes				
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
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8						6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	10.0		10.0	10.0	
Minimum Split (s)	31.6	31.6	10.6	10.6	10.6		10.6	27.7		33.7	33.7	
Total Split (s)	34.6	34.6	29.6	34.6	34.6		29.6	65.7		65.7	65.7	
Total Split (%)	26.6%	26.6%	22.8%	26.6%	26.6%		22.8%	50.6%		50.6%	50.6%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	4.7		4.7	4.7	
All-Red Time (s)	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	
Total Lost Time (s)		4.6	4.6		4.6		4.6	5.7		5.7	5.7	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		Min	Min	

### Intersection Summary

Area Type: Other

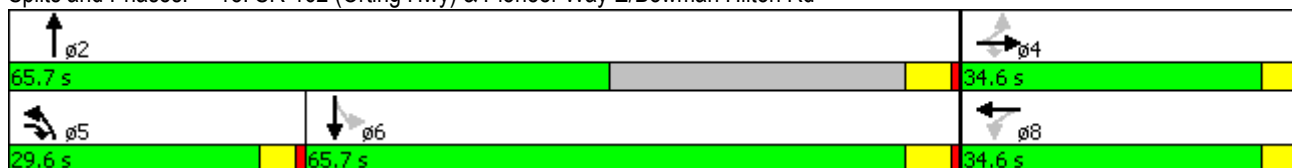
Cycle Length: 129.9

Actuated Cycle Length: 97.8

Natural Cycle: 100




















Control Type: Actuated-Uncoordinated

Splits and Phases: 18: SR-162 (Orting Hwy) & Pioneer Way E/Bowman Hilton Rd



HCM 2010 Signalized Intersection Summary  
 18: SR-162 (Orting Hwy) & Pioneer Way E/Bowman Hilton Rd

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	74	14	333	5	7	19	185	343	2	24	757	55
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1776	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	77	15	246	5	7	20	193	357	2	25	789	57
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	7	7	7	3	3	3	3	3	3
Cap, veh/h	273	47	473	65	77	157	232	1317	7	621	907	66
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.13	0.72	0.72	0.53	0.53	0.53
Sat Flow, veh/h	1206	286	1599	107	469	959	1757	1833	10	1008	1700	123
Grp Volume(v), veh/h	92	0	246	32	0	0	193	0	359	25	0	846
Grp Sat Flow(s),veh/h/ln	1492	0	1599	1535	0	0	1757	0	1843	1008	0	1823
Q Serve(g_s), s	3.0	0.0	11.2	0.0	0.0	0.0	9.3	0.0	5.9	1.0	0.0	35.2
Cycle Q Clear(g_c), s	4.5	0.0	11.2	1.5	0.0	0.0	9.3	0.0	5.9	1.0	0.0	35.2
Prop In Lane	0.84		1.00	0.16		0.62	1.00		0.01	1.00		0.07
Lane Grp Cap(c), veh/h	319	0	473	298	0	0	232	0	1324	621	0	973
V/C Ratio(X)	0.29	0.00	0.52	0.11	0.00	0.00	0.83	0.00	0.27	0.04	0.00	0.87
Avail Cap(c_a), veh/h	582	0	762	562	0	0	504	0	1324	776	0	1254
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	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.3	0.0	25.6	31.2	0.0	0.0	36.9	0.0	4.3	9.7	0.0	17.7
Incr Delay (d2), s/veh	0.4	0.0	0.7	0.1	0.0	0.0	5.7	0.0	0.1	0.0	0.0	5.8
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(0%),veh/ln	2.0	0.0	5.0	0.7	0.0	0.0	4.9	0.0	3.0	0.3	0.0	19.2
LnGrp Delay(d),s/veh	32.7	0.0	26.2	31.3	0.0	0.0	42.5	0.0	4.4	9.8	0.0	23.5
LnGrp LOS	C		C	C			D		A	A		C
Approach Vol, veh/h		338			32			552			871	
Approach Delay, s/veh		28.0			31.3			17.7			23.1	
Approach LOS		C			C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		68.4		18.8	16.1	52.2		18.8				
Change Period (Y+Rc), s		5.7		4.6	4.6	5.7		4.6				
Max Green Setting (Gmax), s		60.0		30.0	25.0	60.0		30.0				
Max Q Clear Time (g_c+1), s		7.9		13.2	11.3	37.2		3.5				
Green Ext Time (p_c), s		13.6		1.1	0.3	9.3		1.2				

Intersection Summary

HCM 2010 Ctrl Delay	22.5
HCM 2010 LOS	C

Notes

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

Lanes, Volumes, Timings  
19: Shaw Rd & 23rd Ave SE

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	
Volume (vph)	90	50	42	29	30	18	31	404	50	16	933	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			3%			-3%			6%	
Storage Length (ft)	100		0	100		0	200		0	250		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1320			1104			4316			2299	
Travel Time (s)		36.0			30.1			84.1			44.8	
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 (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
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	0.97	0.97	0.97	1.02	1.02	1.02	0.98	0.98	0.98	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8			1	6		5	2
Permitted Phases	4			8								
Detector Phase	4	4		8	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	22.5	22.5		21.5	21.5		8.5	18.5		8.5	18.5	
Total Split (s)	25.5	25.5		25.5	25.5		17.5	61.5		17.5	61.5	
Total Split (%)	24.4%	24.4%		24.4%	24.4%		16.7%	58.9%		16.7%	58.9%	
Yellow Time (s)	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	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag							Lead	Lead		Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary

Area Type: Other  
 Cycle Length: 104.5  
 Actuated Cycle Length: 92.6  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated



















Splits and Phases: 19: Shaw Rd & 23rd Ave SE



# HCM 2010 Signalized Intersection Summary

## 19: Shaw Rd & 23rd Ave SE

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	50	42	29	30	18	31	404	50	16	933	96
Number	7	4	14	3	8	18	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1948	1909	1948	1872	1817	1872	1891	1891	1928	1825	1825	1843
Adj Flow Rate, veh/h	93	52	43	30	31	19	32	416	52	16	962	99
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
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, %	2	2	2	3	3	3	2	2	2	1	1	1
Cap, veh/h	184	79	55	135	123	58	48	481	60	637	1028	106
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.03	0.29	0.29	0.37	0.63	0.63
Sat Flow, veh/h	727	537	375	431	843	397	1801	1648	206	1738	1628	168
Grp Volume(v), veh/h	188	0	0	80	0	0	32	0	468	16	0	1061
Grp Sat Flow(s),veh/h/ln	1638	0	0	1670	0	0	1801	0	1854	1738	0	1795
Q Serve(g_s), s	4.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	16.5	0.4	0.0	36.8
Cycle Q Clear(g_c), s	7.5	0.0	0.0	2.8	0.0	0.0	1.2	0.0	16.5	0.4	0.0	36.8
Prop In Lane	0.49		0.23	0.37		0.24	1.00		0.11	1.00		0.09
Lane Grp Cap(c), veh/h	318	0	0	316	0	0	48	0	541	637	0	1134
V/C Ratio(X)	0.59	0.00	0.00	0.25	0.00	0.00	0.67	0.00	0.86	0.03	0.00	0.94
Avail Cap(c_a), veh/h	562	0	0	553	0	0	338	0	1528	637	0	1479
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.3	0.0	0.0	26.4	0.0	0.0	33.4	0.0	23.2	14.0	0.0	11.5
Incr Delay (d2), s/veh	1.8	0.0	0.0	0.4	0.0	0.0	14.9	0.0	4.3	0.0	0.0	9.6
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(0%),veh/ln	3.6	0.0	0.0	1.4	0.0	0.0	0.8	0.0	9.1	0.2	0.0	20.7
LnGrp Delay(d),s/veh	30.0	0.0	0.0	26.8	0.0	0.0	48.3	0.0	27.5	14.0	0.0	21.1
LnGrp LOS	C			C			D		C	B		C
Approach Vol, veh/h		188			80			500			1077	
Approach Delay, s/veh		30.0			26.8			28.8			21.0	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	48.2		14.6	29.9	24.7		14.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	13.0	57.0		21.0	13.0	57.0		21.0				
Max Q Clear Time (g_c+1), s	3.2	38.8		9.5	2.4	18.5		4.8				
Green Ext Time (p_c), s	0.0	4.9		0.7	3.9	1.6		0.8				

### Intersection Summary

HCM 2010 Ctrl Delay	24.3
HCM 2010 LOS	C

### Notes

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

Lanes, Volumes, Timings  
 20: Shaw Rd E/Shaw Rd & 39th Ave SE

1/21/2016

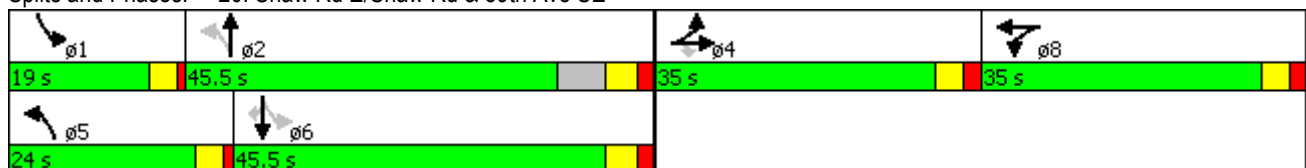


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↕		↖	↕	↗
Volume (vph)	232	3	391	2	2	3	267	350	4	1	712	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	280		0	150		500
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2283			612			552			915	
Travel Time (s)		44.5			11.9			10.8			17.8	
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 (%)	0%	0%	0%	14%	14%	14%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)												
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
Turn Type	Split	NA	Perm	Split	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4				2			6		6
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0		8.0	22.5		8.0	22.5	22.5
Total Split (s)	35.0	35.0	35.0	35.0	35.0		24.0	45.5		19.0	45.5	45.5
Total Split (%)	25.1%	25.1%	25.1%	25.1%	25.1%		17.2%	32.6%		13.6%	32.6%	32.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0		4.0	5.5		4.0	5.5	5.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		None	Min	Min

Intersection Summary





















Area Type: Other  
 Cycle Length: 139.5  
 Actuated Cycle Length: 95.1  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 20: Shaw Rd E/Shaw Rd & 39th Ave SE



HCM 2010 Signalized Intersection Summary  
 20: Shaw Rd E/Shaw Rd & 39th Ave SE

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	232	3	391	2	2	3	267	350	4	1	712	208
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1667	1900	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	247	3	114	2	2	3	284	372	4	1	757	0
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	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
Percent Heavy Veh, %	0	0	0	14	14	14	1	1	1	2	2	2
Cap, veh/h	311	4	281	3	3	5	345	1033	11	543	824	701
Arrive On Green	0.17	0.17	0.17	0.01	0.01	0.01	0.11	0.56	0.56	0.00	0.44	0.00
Sat Flow, veh/h	1789	22	1615	437	437	655	1792	1858	20	1774	1863	1583
Grp Volume(v), veh/h	250	0	114	7	0	0	284	0	376	1	757	0
Grp Sat Flow(s),veh/h/ln	1811	0	1615	1529	0	0	1792	0	1878	1774	1863	1583
Q Serve(g_s), s	9.9	0.0	4.7	0.3	0.0	0.0	5.8	0.0	8.3	0.0	28.5	0.0
Cycle Q Clear(g_c), s	9.9	0.0	4.7	0.3	0.0	0.0	5.8	0.0	8.3	0.0	28.5	0.0
Prop In Lane	0.99		1.00	0.29		0.43	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	315	0	281	11	0	0	345	0	1044	543	824	701
V/C Ratio(X)	0.79	0.00	0.41	0.63	0.00	0.00	0.82	0.00	0.36	0.00	0.92	0.00
Avail Cap(c_a), veh/h	729	0	650	615	0	0	621	0	1044	897	999	850
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	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.5	0.0	27.4	36.9	0.0	0.0	15.5	0.0	9.2	11.5	19.5	0.0
Incr Delay (d2), s/veh	4.5	0.0	0.9	47.0	0.0	0.0	4.9	0.0	0.2	0.0	11.6	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(0%),veh/ln	5.3	0.0	2.1	0.3	0.0	0.0	3.2	0.0	4.3	0.0	17.2	0.0
LnGrp Delay(d),s/veh	34.0	0.0	28.3	83.9	0.0	0.0	20.5	0.0	9.4	11.5	31.1	0.0
LnGrp LOS	C		C	F			C		A	B	C	
Approach Vol, veh/h		364			7			660			758	
Approach Delay, s/veh		32.2			83.9			14.2			31.1	
Approach LOS		C			F			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.1	46.9		18.0	12.5	38.5		5.5				
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0				
Max Green Setting (Gmax), s	15.0	40.0		30.0	20.0	40.0		30.0				
Max Q Clear Time (g_c+1), s	2.0	10.3		11.9	7.8	30.5		2.3				
Green Ext Time (p_c), s	0.0	4.5		1.1	0.7	2.5		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			25.3									
HCM 2010 LOS			C									



Lanes, Volumes, Timings  
 22: 33rd St SE & 80th St E

1/21/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	119	1	4	51	0	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30		30			25
Link Distance (ft)	1192		178			687
Travel Time (s)	27.1		4.0			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
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

# HCM Unsignalized Intersection Capacity Analysis

## 22: 33rd St SE & 80th St E

1/21/2016



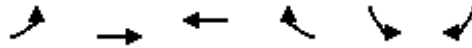
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑	→		↓
Volume (veh/h)	119	1	4	51	0	13
Sign Control	Free		Stop			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	132	1	4	57	0	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		266	0	324	265
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		266	0	324	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		99	95	100	98
cM capacity (veh/h)	1623		588	1085	556	588

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	133	61	14
Volume Left	132	0	0
Volume Right	1	57	0
cSH	1623	1022	588
Volume to Capacity	0.08	0.06	0.02
Queue Length 95th (ft)	7	5	2
Control Delay (s)	7.4	8.7	11.3
Lane LOS	A	A	B
Approach Delay (s)	7.4	8.7	11.3
Approach LOS		A	B

Intersection Summary			
Average Delay		8.0	
Intersection Capacity Utilization		16.7%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings  
 23: E Pioneer & 33rd St SE

1/21/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	44	459	235	4	5	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35	35		25	
Link Distance (ft)		1301	586		178	
Travel Time (s)		25.3	11.4		4.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

**Intersection**

Int Delay, s/veh            2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	44	459	235	4	5	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	47	494	253	4	5	134

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	257	0	843
Stage 1	-	-	255
Stage 2	-	-	588
Critical Hdwy	4.12	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.218	-	3.509
Pot Cap-1 Maneuver	1308	-	335
Stage 1	-	-	790
Stage 2	-	-	557
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1308	-	318
Mov Cap-2 Maneuver	-	-	318
Stage 1	-	-	790
Stage 2	-	-	529

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1308	-	-	-	744
HCM Lane V/C Ratio	0.036	-	-	-	0.188
HCM Control Delay (s)	7.9	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

## 2021 Without-Project LOS

# Lanes, Volumes, Timings

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

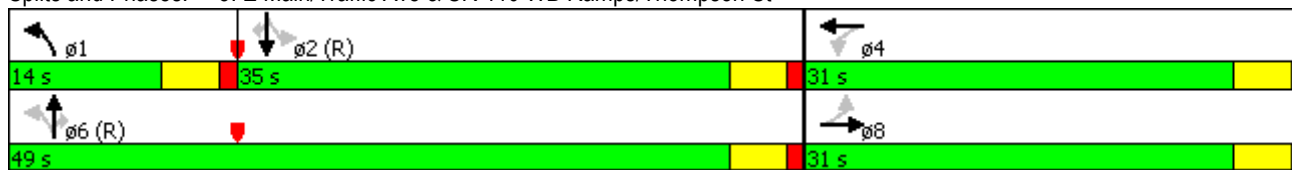


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↗	↖	↖	↗	↖
Volume (vph)	177	34	221	71	81	21	244	806	125	6	184	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	225		0	100		75	110		150
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		381			354			642			1178	
Travel Time (s)		8.7			8.0			12.5			22.9	
Confl. Peds. (#/hr)									1	1		
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%	4%	4%	4%	6%	6%	6%	10%	10%	10%
Shared Lane Traffic (%)												
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
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		8			4		1	6				2
Permitted Phases	8			4			6		6	2		2
Detector Phase	8	8		4	4		1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.6	10.6		10.6	10.6		9.0	25.6	25.6	14.6	14.6	14.6
Total Split (s)	31.0	31.0		31.0	31.0		14.0	49.0	49.0	35.0	35.0	35.0
Total Split (%)	38.8%	38.8%		38.8%	38.8%		17.5%	61.3%	61.3%	43.8%	43.8%	43.8%
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	3.6
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)		4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	C-Min	C-Min	C-Min

### Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated






















### Splits and Phases: 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St



# HCM 2010 Signalized Intersection Summary

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	177	34	221	71	81	21	244	806	125	6	184	163
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1845	1900	1827	1827	1900	1792	1792	1792	1727	1727	1727
Adj Flow Rate, veh/h	182	35	228	73	84	22	252	831	129	6	190	168
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
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	4	4	4	6	6	6	10	10	10
Cap, veh/h	233	46	227	342	461	121	582	995	845	162	675	573
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.07	0.37	0.37	0.39	0.39	0.39
Sat Flow, veh/h	515	140	688	1090	1397	366	1707	1792	1522	540	1727	1466
Grp Volume(v), veh/h	445	0	0	73	0	106	252	831	129	6	190	168
Grp Sat Flow(s),veh/h/ln	1343	0	0	1090	0	1762	1707	1792	1522	540	1727	1466
Q Serve(g_s), s	23.0	0.0	0.0	0.0	0.0	3.4	6.5	33.8	4.5	0.8	6.0	6.3
Cycle Q Clear(g_c), s	26.4	0.0	0.0	5.7	0.0	3.4	6.5	33.8	4.5	21.4	6.0	6.3
Prop In Lane	0.41		0.51	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	507	0	0	342	0	582	582	995	845	162	675	573
V/C Ratio(X)	0.88	0.00	0.00	0.21	0.00	0.18	0.43	0.84	0.15	0.04	0.28	0.29
Avail Cap(c_a), veh/h	507	0	0	342	0	582	600	995	845	162	675	573
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.55	0.55	0.55	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	0.0	0.0	19.9	0.0	19.1	11.7	21.8	12.6	30.4	16.7	16.8
Incr Delay (d2), s/veh	16.0	0.0	0.0	0.3	0.0	0.1	0.3	4.7	0.2	0.4	1.0	1.3
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(0%),veh/ln	12.0	0.0	0.0	1.2	0.0	1.7	3.0	17.9	2.0	0.1	3.0	2.7
LnGrp Delay(d),s/veh	43.7	0.0	0.0	20.2	0.0	19.3	11.9	26.5	12.8	30.9	17.7	18.1
LnGrp LOS	D			C		B	B	C	B	C	B	B
Approach Vol, veh/h		445			179			1212			364	
Approach Delay, s/veh		43.7			19.6			22.0			18.1	
Approach LOS		D			B			C			B	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	13.2	35.8		31.0		49.0		31.0				
Change Period (Y+Rc), s	4.6	4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s	9.4	30.4		26.4		44.4		26.4				
Max Q Clear Time (g_c+1), s	8.5	23.4		7.7		35.8		28.4				
Green Ext Time (p_c), s	0.1	3.2		2.4		3.6		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				25.6								
HCM 2010 LOS				C								

# Lanes, Volumes, Timings

## 4: E Main & SR 410 EB Ramps

1/21/2016

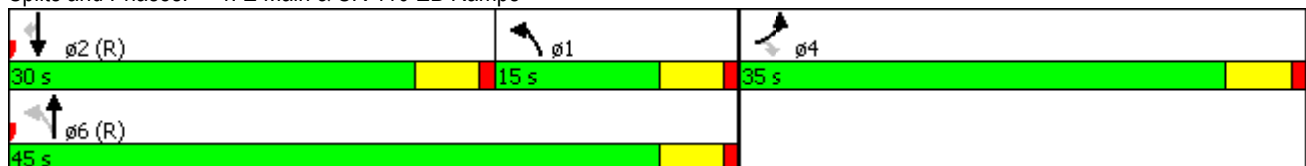


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	424	244	138	724	418	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75	0	175			75
Storage Lanes	1	1	1			1
Taper Length (ft)	50		50			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			35	35	
Link Distance (ft)	516			1317	642	
Travel Time (s)	11.7			25.7	12.5	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	9%	9%	4%	4%	4%	4%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		1	6	2	
Permitted Phases		4	6			2
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	15.0	15.0	15.0
Total Split (s)	35.0	35.0	15.0	45.0	30.0	30.0
Total Split (%)	43.8%	43.8%	18.8%	56.3%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	Min	Min	None	C-Max	C-Max	C-Max

### Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

### Splits and Phases: 4: E Main & SR 410 EB Ramps

















# HCM 2010 Signalized Intersection Summary












## 4: E Main & SR 410 EB Ramps

1/21/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	424	244	138	724	418	57		
Number	7	14	1	6	2	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1743	1743	1827	1827	1827	1827		
Adj Flow Rate, veh/h	437	106	142	746	431	0		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Percent Heavy Veh, %	9	9	4	4	4	4		
Cap, veh/h	493	440	514	1056	571	485		
Arrive On Green	0.30	0.30	0.20	0.58	0.31	0.00		
Sat Flow, veh/h	1660	1482	1740	1827	1827	1553		
Grp Volume(v), veh/h	437	106	142	746	431	0		
Grp Sat Flow(s),veh/h/ln	1660	1482	1740	1827	1827	1553		
Q Serve(g_s), s	20.1	4.3	0.0	23.3	17.0	0.0		
Cycle Q Clear(g_c), s	20.1	4.3	0.0	23.3	17.0	0.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	493	440	514	1056	571	485		
V/C Ratio(X)	0.89	0.24	0.28	0.71	0.75	0.00		
Avail Cap(c_a), veh/h	623	556	514	1056	571	485		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.97	0.00		
Uniform Delay (d), s/veh	26.8	21.3	23.9	12.0	24.7	0.0		
Incr Delay (d2), s/veh	12.8	0.3	0.3	4.0	8.7	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	11.0	1.8	2.5	12.8	9.9	0.0		
LnGrp Delay(d),s/veh	39.6	21.6	24.2	16.0	33.5	0.0		
LnGrp LOS	D	C	C	B	C			
Approach Vol, veh/h	543			888	431			
Approach Delay, s/veh	36.1			17.3	33.5			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	21.3	30.0		28.7		51.3		
Change Period (Y+Rc), s	5.0	5.0		5.0		5.0		
Max Green Setting (Gmax), s	10.0	25.0		30.0		40.0		
Max Q Clear Time (g_c+I1), s	2.0	19.0		22.1		25.3		
Green Ext Time (p_c), s	2.3	0.8		1.6		3.0		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			26.5					
HCM 2010 LOS			C					

Lanes, Volumes, Timings  
 21: Shaw Rd & Site Access

2/4/2016

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	6	16	1148	23	49	428
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500	0		0	200	
Storage Lanes	1	1		0	1	
Taper Length (ft)	50				50	
Link Speed (mph)	30		35			35
Link Distance (ft)	1343		893			1499
Travel Time (s)	30.5		17.4			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

**Intersection**

Int Delay, s/veh 0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	6	16	1148	23	49	428
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	500	0	-	-	200	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	18	1276	26	54	476

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1635	651	0 0 1301 0
Stage 1	1288	-	- - - -
Stage 2	347	-	- - - -
Critical Hdwy	6.84	6.94	- - 4.14 -
Critical Hdwy Stg 1	5.84	-	- - - -
Critical Hdwy Stg 2	5.84	-	- - - -
Follow-up Hdwy	3.52	3.32	- - 2.22 -
Pot Cap-1 Maneuver	92	411	- - 528 -
Stage 1	223	-	- - - -
Stage 2	687	-	- - - -
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	83	411	- - 528 -
Mov Cap-2 Maneuver	177	-	- - - -
Stage 1	223	-	- - - -
Stage 2	617	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	17.4	0	1.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	177	411	528	-
HCM Lane V/C Ratio	-	-	0.038	0.043	0.103	-
HCM Control Delay (s)	-	-	26.1	14.2	12.6	-
HCM Lane LOS	-	-	D	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0.3	-

Lanes, Volumes, Timings  
 22: 33rd St SE & 80th St E

1/21/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	96	1	5	36	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30		30			25
Link Distance (ft)	1192		178			687
Travel Time (s)	27.1		4.0			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
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

# HCM Unsignalized Intersection Capacity Analysis

## 22: 33rd St SE & 80th St E

1/21/2016



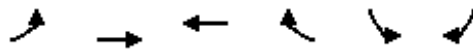
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑	→		↓
Volume (veh/h)	96	1	5	36	0	3
Sign Control	Free		Stop			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	107	1	6	40	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		214	0	257	214
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		214	0	257	214
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 %	93		99	96	100	99
cM capacity (veh/h)	1623		638	1085	633	639

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	108	46	3
Volume Left	107	0	0
Volume Right	1	40	0
cSH	1623	1000	639
Volume to Capacity	0.07	0.05	0.01
Queue Length 95th (ft)	5	4	0
Control Delay (s)	7.3	8.8	10.7
Lane LOS	A	A	B
Approach Delay (s)	7.3	8.8	10.7
Approach LOS		A	B

Intersection Summary			
Average Delay		7.8	
Intersection Capacity Utilization		15.4%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings  
 23: E Pioneer & 33rd St SE

1/21/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	35	209	385	4	2	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35	35		25	
Link Distance (ft)		1301	586		178	
Travel Time (s)		25.3	11.4		4.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

**Intersection**

Int Delay, s/veh 2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	35	209	385	4	2	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	38	225	414	4	2	106

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	418	0	716
Stage 1	-	-	416
Stage 2	-	-	300
Critical Hdwy	4.12	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.218	-	3.509
Pot Cap-1 Maneuver	1141	-	398
Stage 1	-	-	668
Stage 2	-	-	754
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1141	-	383
Mov Cap-2 Maneuver	-	-	383
Stage 1	-	-	668
Stage 2	-	-	725

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1141	-	-	-	631
HCM Lane V/C Ratio	0.033	-	-	-	0.172
HCM Control Delay (s)	8.3	0	-	-	11.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

# Lanes, Volumes, Timings

## 1: N Meridian & Valley Ave NW/Valley Ave NE

1/21/2016

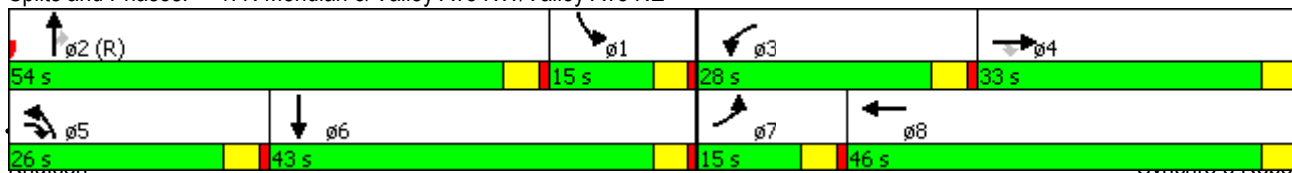


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	578	682	466	156	41	349	525	253	59	918	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			1%			1%	
Storage Length (ft)	250		350	300		0	250		200	200		0
Storage Lanes	1		2	2		0	2		1	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			No			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2026			370			394			1045	
Travel Time (s)		39.5			7.2			7.7			20.4	
Confl. Peds. (#/hr)			3			9			1			5
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 (%)	9%	9%	9%	5%	5%	5%	5%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
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)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4						2			
Detector Phase	7	4	4 5	3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	8.0	4.0	4.0	8.0		4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	8.6	31.6	8.6	8.6	31.6		8.6	31.6	31.6	8.6	37.6	
Total Split (s)	15.0	33.0	26.0	28.0	46.0		26.0	54.0	54.0	15.0	43.0	
Total Split (%)	11.5%	25.4%	20.0%	21.5%	35.4%		20.0%	41.5%	41.5%	11.5%	33.1%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6	3.6	
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	0.0	
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	4.6	4.6	4.6	4.6	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	None	Min	

### Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

### Splits and Phases: 1: N Meridian & Valley Ave NW/Valley Ave NE



2021 Without Project - PM Peak Hour
























Dynamic Report



# HCM 2010 Signalized Intersection Summary

## 1: N Meridian & Valley Ave NW/Valley Ave NE

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	578	682	466	156	41	349	525	253	59	918	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	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
Adj Sat Flow, veh/h/ln	1734	1734	1734	1800	1800	1890	1800	1800	1800	1853	1853	1890
Adj Flow Rate, veh/h	45	590	696	476	159	0	356	536	0	60	937	0
Adj No. of Lanes	1	2	2	2	2	0	2	2	1	1	2	0
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, %	9	9	9	5	5	5	5	5	5	2	2	2
Cap, veh/h	57	720	892	534	1179	0	422	1300	582	176	1242	0
Arrive On Green	0.03	0.22	0.22	0.16	0.34	0.00	0.04	0.13	0.00	0.10	0.35	0.00
Sat Flow, veh/h	1652	3295	2577	3327	3511	0	3327	3421	1530	1765	3614	0
Grp Volume(v), veh/h	45	590	696	476	159	0	356	536	0	60	937	0
Grp Sat Flow(s),veh/h/ln	1652	1648	1288	1663	1710	0	1663	1710	1530	1765	1761	0
Q Serve(g_s), s	3.5	22.2	28.4	18.2	4.2	0.0	13.8	18.8	0.0	4.1	30.5	0.0
Cycle Q Clear(g_c), s	3.5	22.2	28.4	18.2	4.2	0.0	13.8	18.8	0.0	4.1	30.5	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	57	720	892	534	1179	0	422	1300	582	176	1242	0
V/C Ratio(X)	0.80	0.82	0.78	0.89	0.13	0.00	0.84	0.41	0.00	0.34	0.75	0.00
Avail Cap(c_a), veh/h	132	720	892	599	1179	0	548	1300	582	176	1242	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	1.00	0.00	0.93	0.93	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	62.3	48.4	38.2	53.5	29.3	0.0	61.0	43.5	0.0	54.6	37.1	0.0
Incr Delay (d2), s/veh	15.2	5.1	3.0	14.5	0.1	0.0	8.5	0.9	0.0	1.1	2.7	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(0%),veh/ln	1.9	10.6	11.6	9.5	2.0	0.0	6.9	9.1	0.0	2.1	15.3	0.0
LnGrp Delay(d),s/veh	77.6	53.4	41.2	68.0	29.3	0.0	69.5	44.4	0.0	55.7	39.8	0.0
LnGrp LOS	E	D	D	E	C		E	D		E	D	
Approach Vol, veh/h		1331			635			892			997	
Approach Delay, s/veh		47.8			58.3			54.4			40.8	
Approach LOS		D			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.5	54.0	25.5	33.0	21.1	50.4	9.1	49.4				
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6				
Max Green Setting (Gmax), s	10.4	49.4	23.4	28.4	21.4	38.4	10.4	41.4				
Max Q Clear Time (g_c+1), s	6.1	20.8	20.2	30.4	15.8	32.5	5.5	6.2				
Green Ext Time (p_c), s	0.4	2.1	0.6	0.0	0.7	2.2	0.0	7.4				

### Intersection Summary

HCM 2010 Ctrl Delay	49.3
HCM 2010 LOS	D

### Notes

User approved changes to right turn type.

# Lanes, Volumes, Timings

## 2: N Meridian & SR 167 SB Off Ramp

1/21/2016

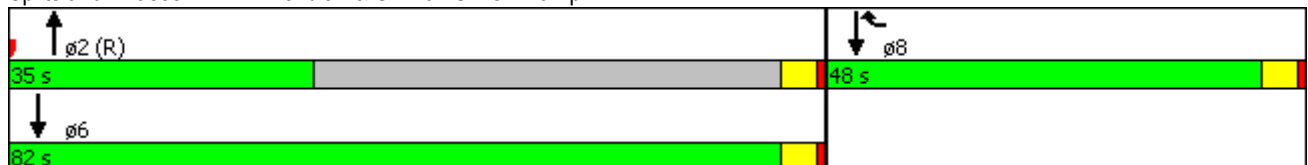


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø6
Lane Configurations		↗↗	↕↕			↖↖	
Volume (vph)	0	583	572	0	0	2072	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	400	0		0	0		
Storage Lanes	0	2		0	0		
Taper Length (ft)	50				50		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	158		482			394	
Travel Time (s)	3.6		11.0			9.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	
Heavy Vehicles (%)	7%	7%	4%	4%	4%	4%	
Shared Lane Traffic (%)							
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	0		24			24	
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		
Turn Type		Prot	NA			NA	
Protected Phases		8	2			6 8	6
Permitted Phases							
Detector Phase		8	2			6 8	
Switch Phase							
Minimum Initial (s)		6.0	10.0				10.0
Minimum Split (s)		10.6	22.6				14.6
Total Split (s)		48.0	35.0				82.0
Total Split (%)		36.9%	26.9%				63%
Yellow Time (s)		3.6	3.6				3.6
All-Red Time (s)		1.0	1.0				1.0
Lost Time Adjust (s)		0.0	0.0				
Total Lost Time (s)		4.6	4.6				
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode		None	C-Min				Min

### Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated

Splits and Phases: 2: N Meridian & SR 167 SB Off Ramp



# HCM Signalized Intersection Capacity Analysis

## 2: N Meridian & SR 167 SB Off Ramp

1/21/2016



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗↘	↕			↕
Volume (vph)	0	583	572	0	0	2072
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6			4.6
Lane Util. Factor		0.88	0.95			0.95
Frt		0.85	1.00			1.00
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		2656	3471			3471
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		2656	3471			3471
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	589	578	0	0	2093
RTOR Reduction (vph)	0	399	0	0	0	0
Lane Group Flow (vph)	0	190	578	0	0	2093
Heavy Vehicles (%)	7%	7%	4%	4%	4%	4%
Turn Type		Prot	NA			NA
Protected Phases		8	2			6 8
Permitted Phases						
Actuated Green, G (s)		34.9	85.9			130.0
Effective Green, g (s)		34.9	85.9			130.0
Actuated g/C Ratio		0.27	0.66			1.00
Clearance Time (s)		4.6	4.6			
Vehicle Extension (s)		3.0	2.8			
Lane Grp Cap (vph)		713	2293			3471
v/s Ratio Prot		0.07	0.17			c0.60
v/s Ratio Perm						
v/c Ratio		0.27	0.25			0.60
Uniform Delay, d1		37.5	9.0			0.0
Progression Factor		1.00	0.57			1.00
Incremental Delay, d2		0.2	0.2			0.2
Delay (s)		37.7	5.3			0.2
Level of Service		D	A			A
Approach Delay (s)	37.7		5.3			0.2
Approach LOS	D		A			A

### Intersection Summary

HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.2
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Lanes, Volumes, Timings

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

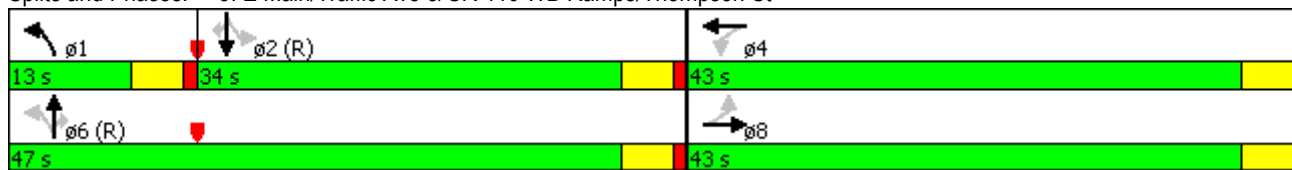


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↗	↖	↖	↗	↖
Volume (vph)	70	21	262	284	132	45	213	442	245	7	424	598
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	225		0	100		75	110		150
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		381			354			642			1178	
Travel Time (s)		8.7			8.0			12.5			22.9	
Confl. Peds. (#/hr)									8	8		
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 (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
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
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		8			4			1	6			2
Permitted Phases	8			4			6		6	2		2
Detector Phase	8	8		4	4		1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.6	10.6		10.6	10.6		9.0	25.6	25.6	14.6	14.6	14.6
Total Split (s)	43.0	43.0		43.0	43.0		13.0	47.0	47.0	34.0	34.0	34.0
Total Split (%)	47.8%	47.8%		47.8%	47.8%		14.4%	52.2%	52.2%	37.8%	37.8%	37.8%
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	3.6
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)		4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	C-Min	C-Min	C-Min

### Intersection Summary






















Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

### Splits and Phases: 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St



HCM 2010 Signalized Intersection Summary  
 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	21	262	284	132	45	213	442	245	7	424	598
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	74	22	276	299	139	47	224	465	258	7	446	629
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
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, %	2	2	2	2	2	2	3	3	3	3	3	3
Cap, veh/h	140	65	449	410	526	178	323	927	782	337	661	555
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.12	0.67	0.67	0.36	0.36	0.36
Sat Flow, veh/h	232	163	1137	1077	1333	451	1757	1845	1555	717	1845	1550
Grp Volume(v), veh/h	372	0	0	299	0	186	224	465	258	7	446	629
Grp Sat Flow(s),veh/h/ln	1532	0	0	1077	0	1783	1757	1845	1555	717	1845	1550
Q Serve(g_s), s	9.0	0.0	0.0	15.0	0.0	6.3	7.0	11.3	6.3	0.6	18.4	32.2
Cycle Q Clear(g_c), s	16.9	0.0	0.0	31.9	0.0	6.3	7.0	11.3	6.3	0.6	18.4	32.2
Prop In Lane	0.20		0.74	1.00		0.25	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	653	0	0	410	0	704	323	927	782	337	661	555
V/C Ratio(X)	0.57	0.00	0.00	0.73	0.00	0.26	0.69	0.50	0.33	0.02	0.67	1.13
Avail Cap(c_a), veh/h	701	0	0	444	0	761	323	927	782	337	661	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	0.0	0.0	28.5	0.0	18.4	17.7	9.3	8.5	18.7	24.4	28.9
Incr Delay (d2), s/veh	1.0	0.0	0.0	5.5	0.0	0.2	4.9	1.5	0.9	0.1	5.4	80.1
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(0%),veh/ln	7.5	0.0	0.0	7.8	0.0	3.1	3.8	6.0	2.8	0.1	10.3	26.1
LnGrp Delay(d),s/veh	22.4	0.0	0.0	34.0	0.0	18.6	22.6	10.8	9.4	18.8	29.9	109.0
LnGrp LOS	C			C		B	C	B	A	B	C	F
Approach Vol, veh/h		372			485			947			1082	
Approach Delay, s/veh		22.4			28.1			13.2			75.8	
Approach LOS		C			C			B			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	13.0	36.8		40.2		49.8		40.2				
Change Period (Y+Rc), s	4.6	4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s	8.4	29.4		38.4		42.4		38.4				
Max Q Clear Time (g_c+1), s	9.0	34.2		33.9		13.3		18.9				
Green Ext Time (p_c), s	0.0	0.0		1.6		8.5		3.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			40.4									
HCM 2010 LOS			D									

# Lanes, Volumes, Timings

## 4: E Main & SR 410 EB Ramps

1/21/2016

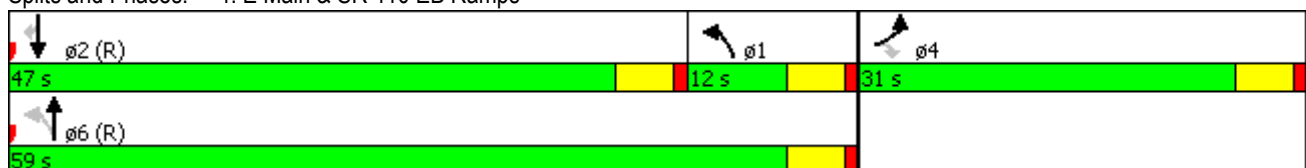


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	254	554	219	659	825	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75	0	175			75
Storage Lanes	1	1	1			1
Taper Length (ft)	50		50			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			35	35	
Link Distance (ft)	516			1317	642	
Travel Time (s)	11.7			25.7	12.5	
Confl. Peds. (#/hr)		7	1			1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		1	6	2	
Permitted Phases		4	6			2
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	15.0	15.0	15.0
Total Split (s)	31.0	31.0	12.0	59.0	47.0	47.0
Total Split (%)	34.4%	34.4%	13.3%	65.6%	52.2%	52.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max

### Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated













Splits and Phases: 4: E Main & SR 410 EB Ramps



# HCM 2010 Signalized Intersection Summary

## 4: E Main & SR 410 EB Ramps

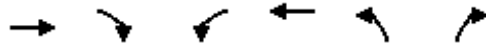
1/21/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	254	554	219	659	825	158		
Number	7	14	1	6	2	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1845	1863	1863	1863	1863		
Adj Flow Rate, veh/h	262	338	226	679	851	0		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Percent Heavy Veh, %	3	3	2	2	2	2		
Cap, veh/h	431	385	295	1199	869	739		
Arrive On Green	0.25	0.25	0.12	0.64	0.47	0.00		
Sat Flow, veh/h	1757	1568	1774	1863	1863	1583		
Grp Volume(v), veh/h	262	338	226	679	851	0		
Grp Sat Flow(s),veh/h/ln	1757	1568	1774	1863	1863	1583		
Q Serve(g_s), s	11.9	18.7	6.9	18.4	40.4	0.0		
Cycle Q Clear(g_c), s	11.9	18.7	6.9	18.4	40.4	0.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	431	385	295	1199	869	739		
V/C Ratio(X)	0.61	0.88	0.77	0.57	0.98	0.00		
Avail Cap(c_a), veh/h	508	453	295	1199	869	739		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.53	0.00		
Uniform Delay (d), s/veh	30.1	32.7	36.5	9.0	23.6	0.0		
Incr Delay (d2), s/veh	1.8	16.3	11.4	1.9	17.7	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	6.0	9.8	6.3	9.9	24.8	0.0		
LnGrp Delay(d),s/veh	31.9	49.0	47.9	10.9	41.3	0.0		
LnGrp LOS	C	D	D	B	D			
Approach Vol, veh/h	600			905	851			
Approach Delay, s/veh	41.5			20.2	41.3			
Approach LOS	D			C	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.9	47.0		27.1		62.9		
Change Period (Y+Rc), s	5.0	5.0		5.0		5.0		
Max Green Setting (Gmax), s	7.0	42.0		26.0		54.0		
Max Q Clear Time (g_c+1), s	8.9	42.4		20.7		20.4		
Green Ext Time (p_c), s	0.0	0.0		1.4		3.5		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			33.2					
HCM 2010 LOS			C					

# Lanes, Volumes, Timings

## 5: Shaw Rd & E Main

1/21/2016

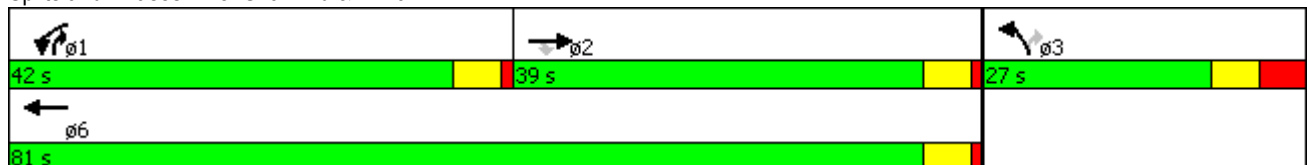


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑
Volume (vph)	413	371	900	610	179	468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		350	475		200	0
Storage Lanes		1	1		1	2
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	35	
Link Distance (ft)	488			1553	1499	
Travel Time (s)	9.5			30.3	29.2	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA	Perm	Prot	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases		2				3
Detector Phase	2	2	1	6	3	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	39.0	39.0	9.0	9.0	12.0	9.0
Total Split (s)	39.0	39.0	42.0	81.0	27.0	42.0
Total Split (%)	36.1%	36.1%	38.9%	75.0%	25.0%	38.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	4.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	8.0	5.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	None	None

### Intersection Summary

Area Type: Other  
 Cycle Length: 108  
 Actuated Cycle Length: 82.8  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Shaw Rd & E Main





# HCM 2010 Signalized Intersection Summary

## 5: Shaw Rd & E Main

1/21/2016

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↗↖	↑	↖	↗↖		
Volume (veh/h)	413	371	900	610	179	468		
Number	2	12	1	6	3	18		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1881	1881	1881	1881		
Adj Flow Rate, veh/h	444	193	968	656	192	355		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	1	1	1	1		
Cap, veh/h	921	411	1167	1253	270	1369		
Arrive On Green	0.26	0.26	0.34	0.67	0.15	0.15		
Sat Flow, veh/h	3632	1580	3476	1881	1792	2814		
Grp Volume(v), veh/h	444	193	968	656	192	355		
Grp Sat Flow(s),veh/h/ln	1770	1580	1738	1881	1792	1407		
Q Serve(g_s), s	7.5	7.3	18.2	12.7	7.2	5.3		
Cycle Q Clear(g_c), s	7.5	7.3	18.2	12.7	7.2	5.3		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	921	411	1167	1253	270	1369		
V/C Ratio(X)	0.48	0.47	0.83	0.52	0.71	0.26		
Avail Cap(c_a), veh/h	1693	756	1809	2011	479	1697		
HCM Platoon Ratio	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		
Uniform Delay (d), s/veh	22.2	22.2	21.7	6.1	28.7	10.7		
Incr Delay (d2), s/veh	0.4	0.8	2.0	0.3	3.4	0.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	3.8	3.3	9.1	6.7	3.8	2.1		
LnGrp Delay(d),s/veh	22.6	23.0	23.7	6.4	32.1	10.8		
LnGrp LOS	C	C	C	A	C	B		
Approach Vol, veh/h	637			1624	547			
Approach Delay, s/veh	22.7			16.7	18.3			
Approach LOS	C			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	28.9	23.5				52.4		18.7
Change Period (Y+Rc), s	5.0	5.0				5.0		8.0
Max Green Setting (Gmax), s	37.0	34.0				76.0		19.0
Max Q Clear Time (g_c+1), s	20.2	9.5				14.7		9.2
Green Ext Time (p_c), s	3.6	8.8				10.6		1.5

### Intersection Summary

HCM 2010 Ctrl Delay	18.4
HCM 2010 LOS	B

### Notes

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

Lanes, Volumes, Timings  
6: 15th St SE/15th St NE & E Main

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	595	307	244	477	154	84	91	139	156	133	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		100	200		100	0		0	0		65
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3360			2256			1179			404	
Travel Time (s)		76.4			51.3			26.8			9.2	
Confl. Peds. (#/hr)	6		3	3		6	3		3	3		3
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 (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
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		Yes			Yes							
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
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	2.0	3.0	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	
Minimum Split (s)	6.5	18.5	18.5	6.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	
Total Split (s)	34.5	49.5	49.5	34.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	
Total Split (%)	25.8%	37.1%	37.1%	25.8%	37.1%	37.1%	37.1%	37.1%	37.1%	37.1%	37.1%	
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	
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	
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	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	

Intersection Summary























Area Type:	Other
Cycle Length:	133.5
Actuated Cycle Length:	85.1
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated

Splits and Phases: 6: 15th St SE/15th St NE & E Main



HCM 2010 Signalized Intersection Summary  
 6: 15th St SE/15th St NE & E Main

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	13	595	307	244	477	154	84	91	139	156	133	18
Number	5	2	12	1	6	16	3	8	18	7	4	14
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		0.99
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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1881	1900	1845	1845	1900	1881	1900
Adj Flow Rate, veh/h	13	613	316	252	492	159	87	94	0	161	137	19
Adj No. of Lanes	1	1	1	1	1	1	0	1	1	0	2	0
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, %	1	1	1	1	1	1	3	3	3	1	1	1
Cap, veh/h	436	812	687	430	1016	859	193	171	334	368	331	47
Arrive On Green	0.01	0.43	0.43	0.12	0.54	0.54	0.21	0.21	0.00	0.21	0.21	0.21
Sat Flow, veh/h	1792	1881	1592	1792	1881	1590	460	804	1568	1150	1557	220
Grp Volume(v), veh/h	13	613	316	252	492	159	181	0	0	173	0	144
Grp Sat Flow(s),veh/h/ln	1792	1881	1592	1792	1881	1590	1264	0	1568	1255	0	1671
Q Serve(g_s), s	0.2	15.5	7.9	3.8	9.2	2.9	4.0	0.0	0.0	0.0	0.0	4.2
Cycle Q Clear(g_c), s	0.2	15.5	7.9	3.8	9.2	2.9	8.1	0.0	0.0	7.3	0.0	4.2
Prop In Lane	1.00		1.00	1.00		1.00	0.48		1.00	0.93		0.13
Lane Grp Cap(c), veh/h	436	812	687	430	1016	859	364	0	334	391	0	356
V/C Ratio(X)	0.03	0.76	0.46	0.59	0.48	0.19	0.50	0.00	0.00	0.44	0.00	0.41
Avail Cap(c_a), veh/h	1378	1503	1273	1177	1503	1271	1227	0	1253	1173	0	1336
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.0	13.5	11.4	10.2	8.1	6.6	20.7	0.0	0.0	20.3	0.0	19.1
Incr Delay (d2), s/veh	0.0	1.5	0.5	1.3	0.4	0.1	1.1	0.0	0.0	0.8	0.0	0.7
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(0%),veh/ln	0.1	8.3	3.5	2.0	4.7	1.3	2.7	0.0	0.0	2.5	0.0	2.0
LnGrp Delay(d),s/veh	9.0	15.0	11.8	11.4	8.4	6.7	21.8	0.0	0.0	21.1	0.0	19.8
LnGrp LOS	A	B	B	B	A	A	C			C		B
Approach Vol, veh/h		942			903			181			317	
Approach Delay, s/veh		13.8			9.0			21.8			20.5	
Approach LOS		B			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	28.8		16.5	4.9	34.9		16.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	30.0	45.0		45.0	30.0	45.0		45.0				
Max Q Clear Time (g_c+1), s	5.8	17.5		9.3	2.2	11.2		10.1				
Green Ext Time (p_c), s	0.8	6.8		1.8	0.0	7.1		1.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				13.5								
HCM 2010 LOS				B								

Lanes, Volumes, Timings  
7: 5th St SE/5th St NE & E Main

1/21/2016

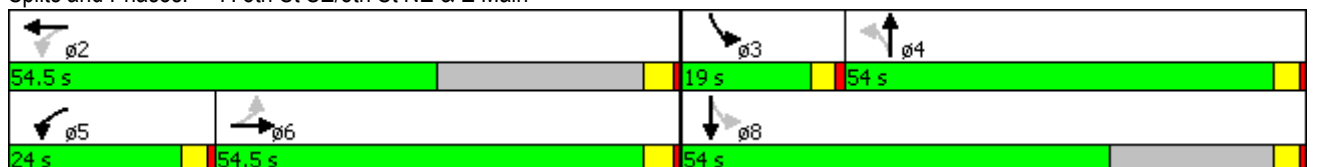


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	378	59	162	531	116	14	184	96	410	577	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	90		0	90		0	90		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		600			3360			543			901	
Travel Time (s)		16.4			76.4			12.3			20.5	
Confl. Peds. (#/hr)	2		3	3		2	2		1	1		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 (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
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		Yes			Yes							
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
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		6		5	2			4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		3	8	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	23.5	23.5		7.0	24.5		24.0	24.0		7.0	23.0	
Total Split (s)	54.5	54.5		24.0	54.5		54.0	54.0		19.0	54.0	
Total Split (%)	36.0%	36.0%		15.8%	36.0%		35.6%	35.6%		12.5%	35.6%	
Yellow Time (s)	3.5	3.5		3.0	3.5		3.0	3.0		3.0	3.0	
All-Red Time (s)	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		4.0	4.5		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?												
Recall Mode	Min	Min		None	Min		None	None		None	Max	

Intersection Summary





















Area Type: Other  
 Cycle Length: 151.5  
 Actuated Cycle Length: 110.3  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 7: 5th St SE/5th St NE & E Main



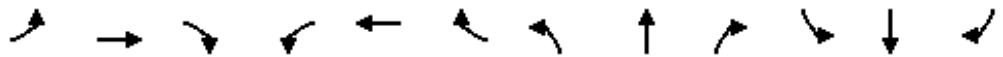
HCM 2010 Signalized Intersection Summary  
 7: 5th St SE/5th St NE & E Main

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	378	59	162	531	116	14	184	96	410	577	47
Number	1	6	16	5	2	12	7	4	14	3	8	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		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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1845	1845	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	26	390	61	167	547	120	14	190	99	423	595	48
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
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, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	152	503	79	304	647	142	227	345	180	499	820	66
Arrive On Green	0.32	0.32	0.32	0.08	0.44	0.44	0.30	0.30	0.30	0.14	0.48	0.48
Sat Flow, veh/h	766	1572	246	1757	1465	321	791	1165	607	1792	1718	139
Grp Volume(v), veh/h	26	0	451	167	0	667	14	0	289	423	0	643
Grp Sat Flow(s),veh/h/ln	766	0	1818	1757	0	1787	791	0	1772	1792	0	1857
Q Serve(g_s), s	3.3	0.0	23.5	6.4	0.0	34.8	1.5	0.0	14.4	15.0	0.0	29.0
Cycle Q Clear(g_c), s	25.4	0.0	23.5	6.4	0.0	34.8	11.5	0.0	14.4	15.0	0.0	29.0
Prop In Lane	1.00		0.14	1.00		0.18	1.00		0.34	1.00		0.07
Lane Grp Cap(c), veh/h	152	0	582	304	0	789	227	0	524	499	0	886
V/C Ratio(X)	0.17	0.00	0.78	0.55	0.00	0.85	0.06	0.00	0.55	0.85	0.00	0.73
Avail Cap(c_a), veh/h	273	0	867	493	0	853	370	0	845	499	0	886
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	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.0	0.0	32.2	23.1	0.0	26.1	34.1	0.0	31.0	24.4	0.0	21.9
Incr Delay (d2), s/veh	0.6	0.0	3.0	1.9	0.0	7.6	0.1	0.0	1.1	13.1	0.0	5.2
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(0%),veh/ln	0.7	0.0	12.3	3.2	0.0	18.7	0.3	0.0	7.1	10.0	0.0	16.1
LnGrp Delay(d),s/veh	43.7	0.0	35.2	25.0	0.0	33.7	34.3	0.0	32.1	37.5	0.0	27.1
LnGrp LOS	D		D	C		C	C		C	D		C
Approach Vol, veh/h		477			834			303			1066	
Approach Delay, s/veh		35.7			31.9			32.2			31.2	
Approach LOS		D			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		50.8	19.0	35.0	12.7	38.0		54.0				
Change Period (Y+Rc), s		4.5	4.0	4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s		50.0	15.0	50.0	20.0	50.0		50.0				
Max Q Clear Time (g_c+I1), s		36.8	17.0	16.4	8.4	27.4		31.0				
Green Ext Time (p_c), s		4.9	0.0	5.1	0.5	6.2		4.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				32.3								
HCM 2010 LOS				C								

Lanes, Volumes, Timings  
8: 2nd St NE & E Stewart St/E Main

1/21/2016

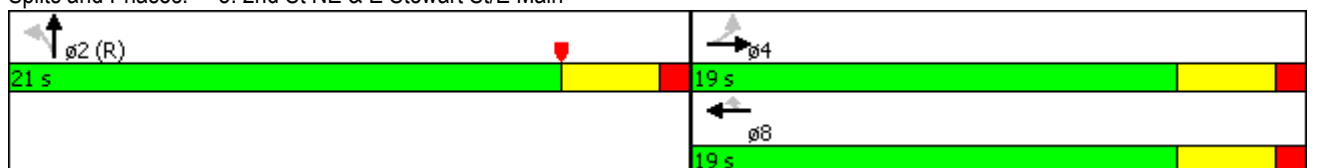


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗		↕				
Volume (vph)	57	365	0	0	376	234	130	774	1	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			25				25
Link Distance (ft)		388			193			477				917
Travel Time (s)		8.8			4.4			13.0				25.0
Confl. Peds. (#/hr)	12					12	8		6			
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 (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	0%	0%	0%
Shared Lane Traffic (%)												
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
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Detector Phase	4	4			8	8	2	2				
Switch Phase												
Minimum Initial (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Minimum Split (s)	18.6	18.6			18.6	18.6	18.6	18.6				
Total Split (s)	19.0	19.0			19.0	19.0	21.0	21.0				
Total Split (%)	47.5%	47.5%			47.5%	47.5%	52.5%	52.5%				
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0				
All-Red Time (s)	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				
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None	None	C-Min	C-Min				

Intersection Summary


















Area Type: Other  
 Cycle Length: 40  
 Actuated Cycle Length: 40  
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated

Splits and Phases: 8: 2nd St NE & E Stewart St/E Main



HCM 2010 Signalized Intersection Summary  
 8: 2nd St NE & E Stewart St/E Main

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	57	365	0	0	376	234	130	774	1	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1900	1845	1900			
Adj Flow Rate, veh/h	60	384	0	0	396	246	137	815	1			
Adj No. of Lanes	1	1	0	0	1	1	0	2	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	0	3	0			
Cap, veh/h	302	626	0	0	626	526	233	1465	2			
Arrive On Green	0.34	0.34	0.00	0.00	0.34	0.34	0.46	0.46	0.46			
Sat Flow, veh/h	782	1863	0	0	1863	1566	503	3157	4			
Grp Volume(v), veh/h	60	384	0	0	396	246	496	0	457			
Grp Sat Flow(s),veh/h/ln	782	1863	0	0	1863	1566	1820	0	1844			
Q Serve(g_s), s	2.8	6.9	0.0	0.0	7.2	4.9	8.0	0.0	7.1			
Cycle Q Clear(g_c), s	10.0	6.9	0.0	0.0	7.2	4.9	8.0	0.0	7.1			
Prop In Lane	1.00		0.00	0.00		1.00	0.28		0.00			
Lane Grp Cap(c), veh/h	302	626	0	0	626	526	844	0	856			
V/C Ratio(X)	0.20	0.61	0.00	0.00	0.63	0.47	0.59	0.00	0.53			
Avail Cap(c_a), veh/h	333	699	0	0	699	587	844	0	856			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.46	0.46	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	15.4	11.1	0.0	0.0	11.2	10.5	7.9	0.0	7.6			
Incr Delay (d2), s/veh	0.1	0.6	0.0	0.0	1.6	0.6	3.0	0.0	2.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(0%),veh/ln	0.6	3.6	0.0	0.0	3.9	2.2	4.7	0.0	4.1			
LnGrp Delay(d),s/veh	15.6	11.7	0.0	0.0	12.8	11.1	10.9	0.0	10.0			
LnGrp LOS	B	B			B	B	B		B			
Approach Vol, veh/h		444			642			953				
Approach Delay, s/veh		12.2			12.1			10.5				
Approach LOS		B			B			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		22.6		17.4				17.4				
Change Period (Y+Rc), s		4.0		4.0				4.0				
Max Green Setting (Gmax), s		17.0		15.0				15.0				
Max Q Clear Time (g_c+1), s		10.0		12.0				9.2				
Green Ext Time (p_c), s		2.2		1.4				2.3				

Intersection Summary

HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

Notes

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

Lanes, Volumes, Timings  
 9: N Meridian & W Stewart St/E Stewart St

1/21/2016

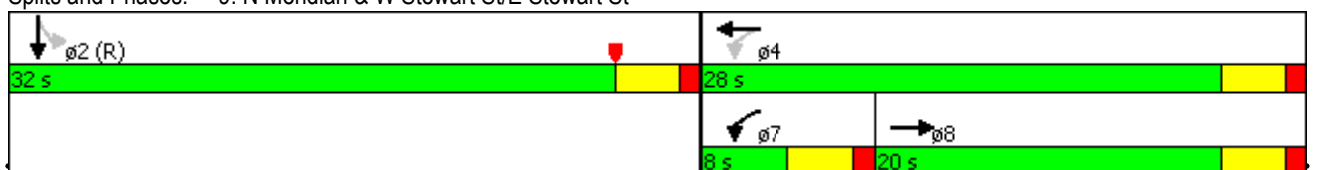


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↖						↗↖	
Volume (vph)	0	259	94	134	354	0	0	0	0	177	1097	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1361			388			473			896	
Travel Time (s)		37.1			10.6			12.9			24.4	
Confl. Peds. (#/hr)			19	19						10		18
Confl. Bikes (#/hr)			3									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 (%)	3%	3%	3%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Shared Lane Traffic (%)												
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
Turn Type		NA		pm+pt		NA				Perm		NA
Protected Phases		8		7	4							2
Permitted Phases				4						2		
Detector Phase		8		7	4					2		2
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0		4.0
Minimum Split (s)		20.0		8.0	20.0					20.0		20.0
Total Split (s)		20.0		8.0	28.0					32.0		32.0
Total Split (%)		33.3%		13.3%	46.7%					53.3%		53.3%
Yellow Time (s)		3.0		3.0	3.0					3.0		3.0
All-Red Time (s)		1.0		1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		4.0		4.0	4.0					4.0		4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Recall Mode		None		None	None					C-Min		C-Min

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:, Start of Yellow  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Splits and Phases: 9: N Meridian & W Stewart St/E Stewart St






















# HCM 2010 Signalized Intersection Summary

## 9: N Meridian & W Stewart St/E Stewart St

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	259	94	134	354	0	0	0	0	177	1097	80
Number	3	8	18	7	4	14				5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	1863	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	276	84	143	377	0				188	1167	82
Adj No. of Lanes	0	1	0	1	1	0				0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	3	3	2	2	0				0	2	0
Cap, veh/h	0	333	101	292	709	0				222	1447	106
Arrive On Green	0.00	0.25	0.25	0.07	0.38	0.00				0.49	0.49	0.49
Sat Flow, veh/h	0	1345	409	1774	1863	0				457	2978	219
Grp Volume(v), veh/h	0	0	360	143	377	0				756	0	681
Grp Sat Flow(s),veh/h/ln	0	0	1754	1774	1863	0				1840	0	1814
Q Serve(g_s), s	0.0	0.0	11.7	3.4	9.4	0.0				21.5	0.0	18.5
Cycle Q Clear(g_c), s	0.0	0.0	11.7	3.4	9.4	0.0				21.5	0.0	18.5
Prop In Lane	0.00		0.23	1.00		0.00				0.25		0.12
Lane Grp Cap(c), veh/h	0	0	434	292	709	0				894	0	881
V/C Ratio(X)	0.00	0.00	0.83	0.49	0.53	0.00				0.85	0.00	0.77
Avail Cap(c_a), veh/h	0	0	468	292	745	0				894	0	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.69	0.69	0.00				0.92	0.00	0.92
Uniform Delay (d), s/veh	0.0	0.0	21.4	15.7	14.4	0.0				13.5	0.0	12.7
Incr Delay (d2), s/veh	0.0	0.0	11.2	0.9	0.4	0.0				9.0	0.0	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.0	0.0	7.0	1.7	4.9	0.0				13.0	0.0	10.6
LnGrp Delay(d),s/veh	0.0	0.0	32.6	16.6	14.9	0.0				22.5	0.0	18.7
LnGrp LOS			C	B	B					C		B
Approach Vol, veh/h		360			520						1437	
Approach Delay, s/veh		32.6			15.3						20.7	
Approach LOS		C			B						C	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		33.2		26.8			8.0	18.8				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		28.0		24.0			4.0	16.0				
Max Q Clear Time (g_c+1), s		23.5		11.4			5.4	13.7				
Green Ext Time (p_c), s		2.5		2.3			0.0	0.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				21.4								
HCM 2010 LOS				C								

Lanes, Volumes, Timings  
10: 5th St SW & W Pioneer

1/21/2016

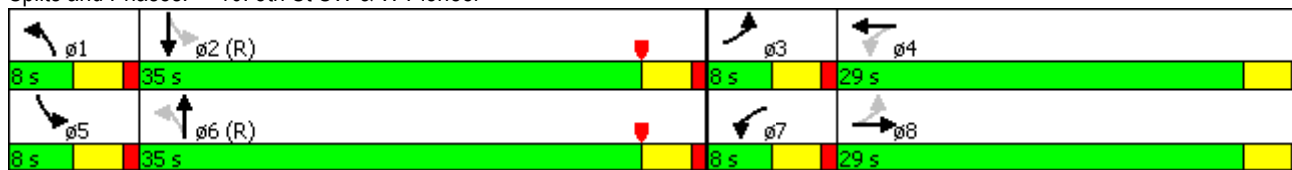


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	373	74	55	492	23	92	419	33	45	460	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	85		0	100		0	100		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		2667			1336			1545			188	
Travel Time (s)		60.6			36.4			35.1			4.3	
Confl. Peds. (#/hr)	4		6	6		4	11		7	7		11
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
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
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.0	22.0		8.0	22.0		8.0	22.0		8.0	23.0	
Total Split (s)	8.0	29.0		8.0	29.0		8.0	35.0		8.0	35.0	
Total Split (%)	10.0%	36.3%		10.0%	36.3%		10.0%	43.8%		10.0%	43.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	

Intersection Summary





















Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Splits and Phases: 10: 5th St SW & W Pioneer



HCM 2010 Signalized Intersection Summary  
 10: 5th St SW & W Pioneer

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	110	373	74	55	492	23	92	419	33	45	460	156
Number	3	8	18	7	4	14	1	6	16	5	2	12
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	1.00		0.99	1.00		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1845	1845	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	115	389	77	57	512	24	96	436	34	47	479	162
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	201	491	97	236	544	25	213	693	54	333	516	175
Arrive On Green	0.05	0.33	0.33	0.04	0.31	0.31	0.05	0.41	0.41	0.03	0.39	0.39
Sat Flow, veh/h	1774	1509	299	1757	1747	82	1774	1704	133	1774	1327	449
Grp Volume(v), veh/h	115	0	466	57	0	536	96	0	470	47	0	641
Grp Sat Flow(s),veh/h/ln	1774	0	1808	1757	0	1829	1774	0	1837	1774	0	1776
Q Serve(g_s), s	3.5	0.0	18.7	1.8	0.0	22.8	2.6	0.0	16.3	1.3	0.0	27.6
Cycle Q Clear(g_c), s	3.5	0.0	18.7	1.8	0.0	22.8	2.6	0.0	16.3	1.3	0.0	27.6
Prop In Lane	1.00		0.17	1.00		0.04	1.00		0.07	1.00		0.25
Lane Grp Cap(c), veh/h	201	0	588	236	0	569	213	0	747	333	0	691
V/C Ratio(X)	0.57	0.00	0.79	0.24	0.00	0.94	0.45	0.00	0.63	0.14	0.00	0.93
Avail Cap(c_a), veh/h	201	0	588	261	0	572	213	0	747	365	0	691
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)	0.19	0.00	0.19	0.76	0.00	0.76	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	0.0	24.5	19.7	0.0	26.9	18.7	0.0	18.9	15.2	0.0	23.4
Incr Delay (d2), s/veh	0.8	0.0	1.5	0.4	0.0	20.0	1.5	0.0	4.0	0.2	0.0	20.6
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(0%),veh/ln	1.8	0.0	9.6	0.9	0.0	14.6	1.3	0.0	9.1	0.6	0.0	17.3
LnGrp Delay(d),s/veh	21.9	0.0	26.0	20.1	0.0	46.9	20.2	0.0	22.9	15.4	0.0	43.9
LnGrp LOS	C		C	C		D	C		C	B		D
Approach Vol, veh/h		581			593			566			688	
Approach Delay, s/veh		25.2			44.3			22.5			42.0	
Approach LOS		C			D			C			D	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	35.1	8.0	28.9	6.6	36.5	6.9	30.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	31.0	4.0	25.0	4.0	31.0	4.0	25.0				
Max Q Clear Time (g_c+I1), s	4.6	29.6	5.5	24.8	3.3	18.3	3.8	20.7				
Green Ext Time (p_c), s	0.0	0.7	0.0	0.0	0.0	3.7	0.0	1.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			34.0									
HCM 2010 LOS			C									

# Lanes, Volumes, Timings

## 11: S Meridian & W Pioneer/E Pioneer

1/21/2016

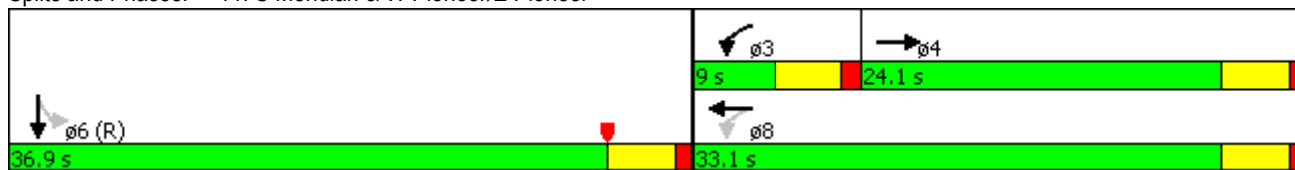


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	327	73	136	422	0	0	0	0	145	1029	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1336			594			1560			189	
Travel Time (s)		36.4			16.2			42.5			5.2	
Confl. Peds. (#/hr)			4	4		8				4		31
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%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Shared Lane Traffic (%)												
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
Turn Type		NA		pm+pt	NA					Perm		NA
Protected Phases		4		3	8							6
Permitted Phases				8						6		
Detector Phase		4		3	8					6		6
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0		4.0
Minimum Split (s)		23.6		9.0	23.6					23.6		23.6
Total Split (s)		24.1		9.0	33.1					36.9		36.9
Total Split (%)		34.4%		12.9%	47.3%					52.7%		52.7%
Yellow Time (s)		3.6		3.6	3.6					3.6		3.6
All-Red Time (s)		1.0		1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		4.6		4.6	4.6					4.6		4.6
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Recall Mode		None		None	None					C-Max		C-Max

### Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Yellow  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated


















Splits and Phases: 11: S Meridian & W Pioneer/E Pioneer



# HCM 2010 Signalized Intersection Summary

## 11: S Meridian & W Pioneer/E Pioneer

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	327	73	136	422	0	0	0	0	145	1029	126
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				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
Adj Sat Flow, veh/h/ln	0	1881	1900	1900	1900	1900				1900	1881	1900
Adj Flow Rate, veh/h	0	348	68	145	449	0				154	1095	130
Adj No. of Lanes	0	1	0	1	1	0				0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	1	1	0	0	0				0	1	0
Cap, veh/h	0	396	77	257	736	0				181	1343	167
Arrive On Green	0.00	0.26	0.26	0.06	0.39	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	1528	299	1810	1900	0				392	2910	362
Grp Volume(v), veh/h	0	0	416	145	449	0				731	0	648
Grp Sat Flow(s),veh/h/ln	0	0	1827	1810	1900	0				1862	0	1803
Q Serve(g_s), s	0.0	0.0	15.3	4.0	13.3	0.0				24.4	0.0	21.2
Cycle Q Clear(g_c), s	0.0	0.0	15.3	4.0	13.3	0.0				24.4	0.0	21.2
Prop In Lane	0.00		0.16	1.00		0.00				0.21		0.20
Lane Grp Cap(c), veh/h	0	0	473	257	736	0				859	0	832
V/C Ratio(X)	0.00	0.00	0.88	0.57	0.61	0.00				0.85	0.00	0.78
Avail Cap(c_a), veh/h	0	0	509	257	774	0				859	0	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.63	0.39	0.39	0.00				0.92	0.00	0.92
Uniform Delay (d), s/veh	0.0	0.0	24.9	18.6	17.2	0.0				16.7	0.0	15.8
Incr Delay (d2), s/veh	0.0	0.0	10.4	1.1	0.5	0.0				9.7	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.0	0.0	9.0	2.0	7.0	0.0				14.7	0.0	12.0
LnGrp Delay(d),s/veh	0.0	0.0	35.3	19.7	17.7	0.0				26.4	0.0	22.4
LnGrp LOS			D	B	B					C		C
Approach Vol, veh/h		416			594						1379	
Approach Delay, s/veh		35.3			18.2						24.5	
Approach LOS		D			B						C	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.0	22.7		36.9		31.7				
Change Period (Y+Rc), s			4.6	4.6		4.6		4.6				
Max Green Setting (Gmax), s			4.4	19.5		32.3		28.5				
Max Q Clear Time (g_c+1), s			6.0	17.3		26.4		15.3				
Green Ext Time (p_c), s			0.0	0.8		3.0		2.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			24.8									
HCM 2010 LOS			C									

# Lanes, Volumes, Timings

## 12: 3rd St SE & E Pioneer

1/21/2016

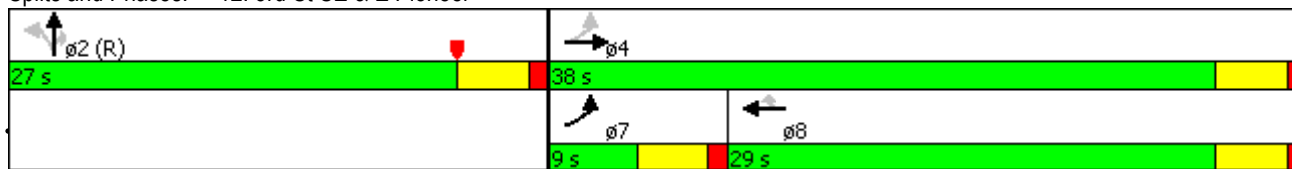


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗		↕	↗			
Volume (vph)	66	449	0	0	548	220	53	543	116	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			2%			2%			0%	
Storage Length (ft)	100		0	0		0	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		594			701			1281			183	
Travel Time (s)		16.2			19.1			34.9			5.0	
Confl. Peds. (#/hr)	5		6			5	2		6			
Confl. Bikes (#/hr)									1			
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 (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
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	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Minimum Split (s)	9.0	24.6			24.6	24.6	26.6	26.6	26.6			
Total Split (s)	9.0	38.0			29.0	29.0	27.0	27.0	27.0			
Total Split (%)	13.8%	58.5%			44.6%	44.6%	41.5%	41.5%	41.5%			
Yellow Time (s)	3.6	3.6			3.6	3.6	3.6	3.6	3.6			
All-Red Time (s)	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			
Total Lost Time (s)	4.6	4.6			4.6	4.6		4.6	4.6			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	None			None	None	C-Max	C-Max	C-Max			

### Intersection Summary

Area Type: Other  
 Cycle Length: 65  
 Actuated Cycle Length: 65  
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Splits and Phases: 12: 3rd St SE & E Pioneer





















2021 Without Project - PM Peak Hour

Dynamic Report

HCM 2010 Signalized Intersection Summary  
 12: 3rd St SE & E Pioneer

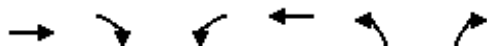
1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	66	449	0	0	548	220	53	543	116	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	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			
Adj Sat Flow, veh/h/ln	1862	1862	0	0	1881	1881	1881	1881	1881			
Adj Flow Rate, veh/h	68	463	0	0	565	227	55	560	120			
Adj No. of Lanes	1	1	0	0	1	1	0	2	1			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	0	0	0	0	0			
Cap, veh/h	230	852	0	0	646	547	125	1339	623			
Arrive On Green	0.04	0.46	0.00	0.00	0.34	0.34	0.40	0.40	0.40			
Sat Flow, veh/h	1774	1862	0	0	1881	1592	312	3340	1554			
Grp Volume(v), veh/h	68	463	0	0	565	227	329	286	120			
Grp Sat Flow(s),veh/h/ln	1774	1862	0	0	1881	1592	1865	1787	1554			
Q Serve(g_s), s	1.5	11.7	0.0	0.0	18.3	7.1	8.3	7.4	3.3			
Cycle Q Clear(g_c), s	1.5	11.7	0.0	0.0	18.3	7.1	8.3	7.4	3.3			
Prop In Lane	1.00		0.00	0.00		1.00	0.17		1.00			
Lane Grp Cap(c), veh/h	230	852	0	0	646	547	748	716	623			
V/C Ratio(X)	0.30	0.54	0.00	0.00	0.87	0.42	0.44	0.40	0.19			
Avail Cap(c_a), veh/h	273	957	0	0	706	598	748	716	623			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.38	0.38	0.00	0.00	0.94	0.94	1.00	1.00	1.00			
Uniform Delay (d), s/veh	15.0	12.7	0.0	0.0	20.0	16.3	14.2	13.9	12.6			
Incr Delay (d2), s/veh	0.3	0.2	0.0	0.0	10.5	0.5	1.9	1.7	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(0%),veh/ln	0.7	6.0	0.0	0.0	11.3	3.2	4.7	4.0	1.5			
LnGrp Delay(d),s/veh	15.3	12.9	0.0	0.0	30.6	16.8	16.0	15.6	13.3			
LnGrp LOS	B	B			C	B	B	B	B			
Approach Vol, veh/h		531			792			735				
Approach Delay, s/veh		13.2			26.6			15.4				
Approach LOS		B			C			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		30.6		34.4			7.4	26.9				
Change Period (Y+Rc), s		4.6		4.6			4.6	4.6				
Max Green Setting (Gmax), s		22.4		33.4			4.4	24.4				
Max Q Clear Time (g_c+1), s		10.3		13.7			3.5	20.3				
Green Ext Time (p_c), s		2.2		4.8			0.0	2.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				19.2								
HCM 2010 LOS				B								

# Lanes, Volumes, Timings

## 13: SR 512 WB Ramps & E Pioneer

1/21/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	↗
Volume (vph)	616	350	358	572	153	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	236
Storage Lanes		0	1		1	1
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	30	
Link Distance (ft)	334			803	571	
Travel Time (s)	6.5			15.6	13.0	
Confl. Peds. (#/hr)		7				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
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)		9	15		15	9
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases						4
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	8.0		6.0	8.0	8.0	8.0
Minimum Split (s)	27.5		10.5	12.5	12.5	12.5
Total Split (s)	28.5		19.0	47.5	12.5	12.5
Total Split (%)	47.5%		31.7%	79.2%	20.8%	20.8%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min		None	C-Min	None	None

### Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated














Splits and Phases: 13: SR 512 WB Ramps & E Pioneer





HCM 2010 Signalized Intersection Summary  
 13: SR 512 WB Ramps & E Pioneer

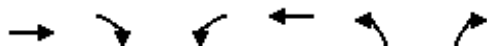
1/21/2016

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	 			 				
Volume (veh/h)	616	350	358	572	153	63		
Number	6	16	5	2	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1900	1881	1881	1863	1863		
Adj Flow Rate, veh/h	642	365	373	596	159	0		
Adj No. of Lanes	2	0	1	2	1	1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		
Percent Heavy Veh, %	1	1	1	1	2	2		
Cap, veh/h	911	518	421	2595	220	196		
Arrive On Green	0.42	0.42	0.24	0.73	0.12	0.00		
Sat Flow, veh/h	2285	1245	1792	3668	1774	1583		
Grp Volume(v), veh/h	524	483	373	596	159	0		
Grp Sat Flow(s),veh/h/ln	1787	1649	1792	1787	1774	1583		
Q Serve(g_s), s	14.5	14.5	12.1	3.3	5.2	0.0		
Cycle Q Clear(g_c), s	14.5	14.5	12.1	3.3	5.2	0.0		
Prop In Lane		0.76	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	743	686	421	2595	220	196		
V/C Ratio(X)	0.70	0.70	0.89	0.23	0.72	0.00		
Avail Cap(c_a), veh/h	743	686	433	2595	237	211		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.93	0.93	1.00	0.00		
Uniform Delay (d), s/veh	14.5	14.5	22.2	2.7	25.3	0.0		
Incr Delay (d2), s/veh	5.5	6.0	17.9	0.2	10.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	8.3	7.7	8.0	1.6	3.1	0.0		
LnGrp Delay(d),s/veh	20.0	20.5	40.0	2.9	35.5	0.0		
LnGrp LOS	C	C	D	A	D			
Approach Vol, veh/h	1007			969	159			
Approach Delay, s/veh	20.2			17.2	35.5			
Approach LOS	C			B	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	2		4		5	6		
Phs Duration (G+Y+Rc), s	48.1		11.9		18.6	29.5		
Change Period (Y+Rc), s	4.5		4.5		4.5	4.5		
Max Green Setting (Gmax), s	43.0		8.0		14.5	24.0		
Max Q Clear Time (g_c+1), s	5.3		7.2		14.1	16.5		
Green Ext Time (p_c), s	7.4		0.0		0.1	3.9		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			20.0					
HCM 2010 LOS			B					

# Lanes, Volumes, Timings

## 14: SR 512 EB Ramps & E Pioneer

1/21/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Volume (vph)	535	143	60	755	168	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	170		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	30	
Link Distance (ft)	803			1011	357	
Travel Time (s)	15.6			19.7	8.1	
Confl. Peds. (#/hr)		8				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
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)		9	15		15	9
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases						4
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	8.0		6.0	8.0	8.0	8.0
Minimum Split (s)	28.5		10.6	12.6	12.6	12.6
Total Split (s)	29.4		10.6	40.0	15.0	15.0
Total Split (%)	53.5%		19.3%	72.7%	27.3%	27.3%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min		None	C-Min	None	None

### Intersection Summary












Area Type: Other  
 Cycle Length: 55  
 Actuated Cycle Length: 55  
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated

Splits and Phases: 14: SR 512 EB Ramps & E Pioneer



HCM 2010 Signalized Intersection Summary  
 14: SR 512 EB Ramps & E Pioneer

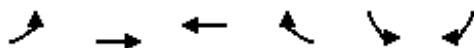
1/21/2016

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Volume (veh/h)	535	143	60	755	168	293		
Number	6	16	5	2	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1900	1881	1881	1863	1863		
Adj Flow Rate, veh/h	575	154	65	812	181	245		
Adj No. of Lanes	2	0	1	2	1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	1	1	2	2		
Cap, veh/h	1378	368	123	2323	331	295		
Arrive On Green	0.50	0.50	0.07	0.65	0.19	0.19		
Sat Flow, veh/h	2852	737	1792	3668	1774	1583		
Grp Volume(v), veh/h	368	361	65	812	181	245		
Grp Sat Flow(s),veh/h/ln	1770	1726	1792	1787	1774	1583		
Q Serve(g_s), s	7.2	7.3	1.9	5.7	5.1	8.2		
Cycle Q Clear(g_c), s	7.2	7.3	1.9	5.7	5.1	8.2		
Prop In Lane		0.43	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	884	862	123	2323	331	295		
V/C Ratio(X)	0.42	0.42	0.53	0.35	0.55	0.83		
Avail Cap(c_a), veh/h	884	862	199	2323	339	302		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.68	0.68	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	8.7	8.7	24.8	4.4	20.3	21.5		
Incr Delay (d2), s/veh	1.0	1.0	3.5	0.4	2.0	17.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	3.7	3.6	1.1	2.8	2.7	8.2		
LnGrp Delay(d),s/veh	9.7	9.7	28.2	4.8	22.3	39.0		
LnGrp LOS	A	A	C	A	C	D		
Approach Vol, veh/h	729			877	426			
Approach Delay, s/veh	9.7			6.5	31.9			
Approach LOS	A			A	C			
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		40.3		14.7	8.3	32.0		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		35.5		10.5	6.1	24.9		
Max Q Clear Time (g_c+1), s		7.7		10.2	3.9	9.3		
Green Ext Time (p_c), s		8.6		0.1	0.0	6.9		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			13.0					
HCM 2010 LOS			B					

# Lanes, Volumes, Timings

## 15: E Pioneer & 15th St SE

1/21/2016

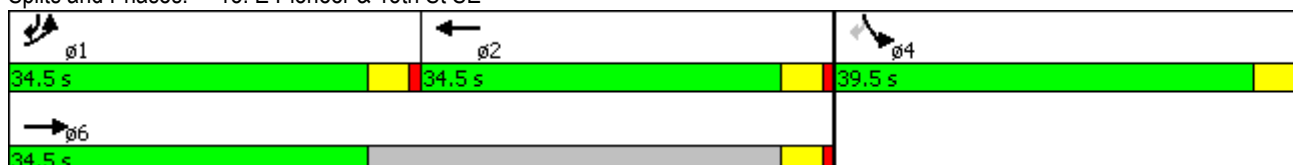


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	228	572	502	117	272	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		30	
Link Distance (ft)		838	468		1179	
Travel Time (s)		16.3	9.1		26.8	
Confl. Peds. (#/hr)					11	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		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	15	9
Turn Type	Prot	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases						4
Detector Phase	1	6	2		4	1
Switch Phase						
Minimum Initial (s)	3.0	3.0	3.0		3.0	3.0
Minimum Split (s)	7.5	7.5	30.5		24.5	7.5
Total Split (s)	34.5	34.5	34.5		39.5	34.5
Total Split (%)	31.8%	31.8%	31.8%		36.4%	31.8%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?						
Recall Mode	None	Min	Min		None	None

### Intersection Summary

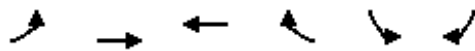
Area Type: Other  
 Cycle Length: 108.5  
 Actuated Cycle Length: 65.3  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 15: E Pioneer & 15th St SE



HCM 2010 Signalized Intersection Summary  
 15: E Pioneer & 15th St SE

1/21/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Volume (veh/h)	228	572	502	117	272	362		
Number	1	6	2	12	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1881	1900	1881	1881		
Adj Flow Rate, veh/h	233	584	512	119	278	369		
Adj No. of Lanes	1	2	2	0	1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98		
Percent Heavy Veh, %	2	2	1	1	1	1		
Cap, veh/h	307	1962	833	193	466	878		
Arrive On Green	0.17	0.55	0.29	0.29	0.26	0.26		
Sat Flow, veh/h	1774	3632	2978	667	1792	1599		
Grp Volume(v), veh/h	233	584	316	315	278	369		
Grp Sat Flow(s),veh/h/ln	1774	1770	1787	1763	1792	1599		
Q Serve(g_s), s	6.1	4.3	7.4	7.5	6.6	6.6		
Cycle Q Clear(g_c), s	6.1	4.3	7.4	7.5	6.6	6.6		
Prop In Lane	1.00			0.38	1.00	1.00		
Lane Grp Cap(c), veh/h	307	1962	516	509	466	878		
V/C Ratio(X)	0.76	0.30	0.61	0.62	0.60	0.42		
Avail Cap(c_a), veh/h	1096	2187	1104	1090	1292	1614		
HCM Platoon Ratio	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		
Uniform Delay (d), s/veh	19.1	5.8	14.9	14.9	15.7	6.4		
Incr Delay (d2), s/veh	3.9	0.1	1.2	1.2	1.7	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	3.3	2.1	3.8	3.8	3.5	4.8		
LnGrp Delay(d),s/veh	23.0	5.9	16.1	16.2	17.5	6.9		
LnGrp LOS	C	A	B	B	B	A		
Approach Vol, veh/h		817	631		647			
Approach Delay, s/veh		10.7	16.1		11.4			
Approach LOS		B	B		B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	12.9	18.5		17.1		31.4		
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		
Max Green Setting (Gmax), s	30.0	30.0		35.0		30.0		
Max Q Clear Time (g_c+1), s	8.1	9.5		8.6		6.3		
Green Ext Time (p_c), s	0.7	4.5		4.0		4.7		

Intersection Summary

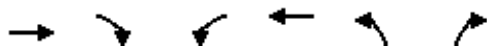
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Notes

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

Lanes, Volumes, Timings  
16: 21st St SE & E Pioneer

1/21/2016

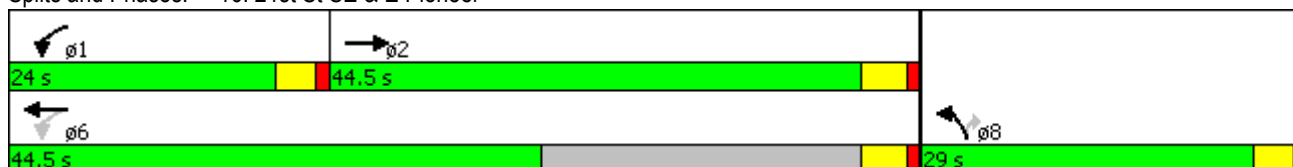


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Volume (vph)	740	63	84	619	55	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		150	0
Storage Lanes		0	0		1	1
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	25	
Link Distance (ft)	1383			1343	450	
Travel Time (s)	26.9			26.2	12.3	
Confl. Peds. (#/hr)		3	3			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	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)		9	15		15	9
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	8.0		12.0	8.0	4.0	4.0
Minimum Split (s)	24.5		16.0	12.5	8.0	8.0
Total Split (s)	44.5		24.0	44.5	29.0	29.0
Total Split (%)	45.6%		24.6%	45.6%	29.7%	29.7%
Yellow Time (s)	3.5		3.0	3.5	3.0	3.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.0	4.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	Min		None	Min	None	None

Intersection Summary

Area Type: Other  
 Cycle Length: 97.5  
 Actuated Cycle Length: 36.4  
 Natural Cycle: 50  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 16: 21st St SE & E Pioneer



HCM 2010 Signalized Intersection Summary  
 16: 21st St SE & E Pioneer

1/21/2016

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑			↑↑	↖	↗		
Volume (veh/h)	740	63	84	619	55	82		
Number	2	12	1	6	3	18		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1900	1900	1881	1900	1900		
Adj Flow Rate, veh/h	771	66	88	645	57	0		
Adj No. of Lanes	2	0	0	2	1	1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		
Percent Heavy Veh, %	1	1	1	1	0	0		
Cap, veh/h	2383	204	127	1468	87	78		
Arrive On Green	0.72	0.72	0.72	0.72	0.05	0.00		
Sat Flow, veh/h	3426	285	2	2138	1810	1615		
Grp Volume(v), veh/h	413	424	341	392	57	0		
Grp Sat Flow(s),veh/h/ln	1787	1830	427	1627	1810	1615		
Q Serve(g_s), s	3.1	3.1	13.1	3.2	1.1	0.0		
Cycle Q Clear(g_c), s	3.1	3.1	13.1	3.2	1.1	0.0		
Prop In Lane		0.16	0.26		1.00	1.00		
Lane Grp Cap(c), veh/h	1278	1309	0	1163	87	78		
V/C Ratio(X)	0.32	0.32	0.00	0.34	0.65	0.00		
Avail Cap(c_a), veh/h	1990	2038	0	1811	1259	1124		
HCM Platoon Ratio	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	0.00		
Uniform Delay (d), s/veh	1.9	1.9	0.0	1.9	16.8	0.0		
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.2	7.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	1.6	1.6	0.0	1.5	0.7	0.0		
LnGrp Delay(d),s/veh	2.1	2.1	0.0	2.2	24.7	0.0		
LnGrp LOS	A	A		A	C			
Approach Vol, veh/h	837			733	57			
Approach Delay, s/veh	2.1			1.2	24.7			
Approach LOS	A			A	C			
<b>Timer</b>	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		30.2				30.2		5.7
Change Period (Y+Rc), s		4.5				4.5		4.0
Max Green Setting (Gmax), s		40.0				40.0		25.0
Max Q Clear Time (g_c+1), s		5.1				15.1		3.1
Green Ext Time (p_c), s		12.0				10.6		0.1
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			2.5					
HCM 2010 LOS			A					

# Lanes, Volumes, Timings

## 17: Shaw Rd & E Pioneer

1/21/2016

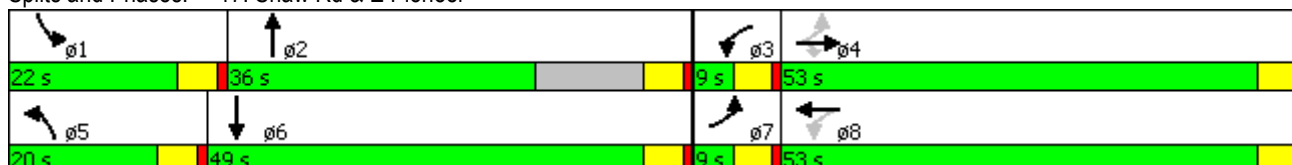


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	370	371	139	256	56	178	432	63	168	955	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	250		0	450		0
Storage Lanes	1		1	1		0	2		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1445			1301			1580			893	
Travel Time (s)		28.1			25.3			30.8			17.4	
Confl. Peds. (#/hr)												1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
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			24			24	
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
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8								
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	42.0	42.0	9.0	52.0		9.0	35.0		9.0	38.0	
Total Split (s)	9.0	53.0	53.0	9.0	53.0		20.0	36.0		22.0	49.0	
Total Split (%)	6.9%	40.5%	40.5%	6.9%	40.5%		15.3%	27.5%		16.8%	37.4%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	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)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		None	Min	

### Intersection Summary

Area Type: Other  
 Cycle Length: 131  
 Actuated Cycle Length: 104.8  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated

### Splits and Phases: 17: Shaw Rd & E Pioneer



























# HCM 2010 Signalized Intersection Summary

## 17: Shaw Rd & E Pioneer

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	92	370	371	139	256	56	178	432	63	168	955	146
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	96	385	289	145	267	58	185	450	66	175	995	152
Adj No. of Lanes	1	1	1	1	1	0	2	2	0	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	255	477	406	205	380	83	269	1129	165	212	1249	191
Arrive On Green	0.04	0.26	0.26	0.04	0.26	0.26	0.08	0.36	0.36	0.12	0.40	0.40
Sat Flow, veh/h	1774	1863	1583	1774	1484	322	3476	3131	457	1792	3110	475
Grp Volume(v), veh/h	96	385	289	145	0	325	185	256	260	175	572	575
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1806	1738	1787	1801	1792	1787	1797
Q Serve(g_s), s	3.6	17.6	15.1	4.0	0.0	14.8	4.7	9.7	9.8	8.7	25.5	25.6
Cycle Q Clear(g_c), s	3.6	17.6	15.1	4.0	0.0	14.8	4.7	9.7	9.8	8.7	25.5	25.6
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.25	1.00		0.26
Lane Grp Cap(c), veh/h	255	477	406	205	0	463	269	644	649	212	718	722
V/C Ratio(X)	0.38	0.81	0.71	0.71	0.00	0.70	0.69	0.40	0.40	0.82	0.80	0.80
Avail Cap(c_a), veh/h	255	986	838	205	0	955	575	644	649	336	867	871
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	31.6	30.7	30.8	0.0	30.6	40.8	21.6	21.7	39.1	23.9	23.9
Incr Delay (d2), s/veh	0.9	3.3	2.3	10.6	0.0	2.0	3.1	0.4	0.4	8.9	4.3	4.4
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(0%),veh/ln	1.8	9.4	6.8	3.3	0.0	7.7	2.4	4.8	4.9	4.8	13.4	13.5
LnGrp Delay(d),s/veh	25.7	34.9	33.0	41.4	0.0	32.5	43.9	22.0	22.1	48.0	28.2	28.2
LnGrp LOS	C	C	C	D		C	D	C	C	D	C	C
Approach Vol, veh/h		770			470			701			1322	
Approach Delay, s/veh		33.0			35.3			27.8			30.8	
Approach LOS		C			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.8	37.7	9.0	28.3	12.0	41.5	9.0	28.3				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	17.0	31.0	4.0	48.0	15.0	44.0	4.0	48.0				
Max Q Clear Time (g_c+1), s	10.7	11.8	6.0	19.6	6.7	27.6	5.6	16.8				
Green Ext Time (p_c), s	0.2	10.6	0.0	3.7	0.4	8.9	0.0	3.7				

### Intersection Summary

HCM 2010 Ctrl Delay	31.4
HCM 2010 LOS	C

### Notes

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

# Lanes, Volumes, Timings

## 18: SR-162 (Orting Hwy) & Pioneer Way E/Bowman Hilton Rd

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↕		↖	↕	
Volume (vph)	88	17	388	6	8	21	216	398	2	27	878	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	400		0	225		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			25			35			35	
Link Distance (ft)		3040			392			769			482	
Travel Time (s)		59.2			10.7			15.0			9.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	1%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
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								Yes				
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
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8						6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	10.0		10.0	10.0	
Minimum Split (s)	31.6	31.6	10.6	10.6	10.6		10.6	27.7		33.7	33.7	
Total Split (s)	34.6	34.6	29.6	34.6	34.6		29.6	65.7		65.7	65.7	
Total Split (%)	26.6%	26.6%	22.8%	26.6%	26.6%		22.8%	50.6%		50.6%	50.6%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	4.7		4.7	4.7	
All-Red Time (s)	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	
Total Lost Time (s)		4.6	4.6		4.6		4.6	5.7		5.7	5.7	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		Min	Min	

### Intersection Summary

Area Type: Other

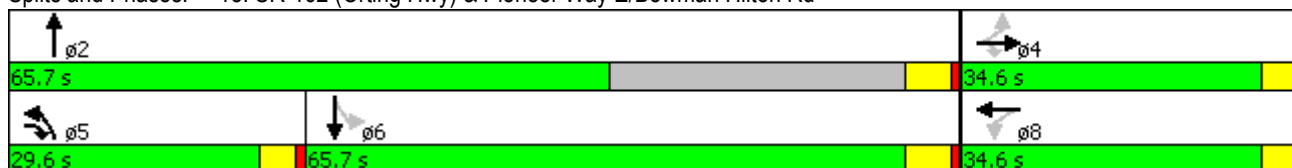
Cycle Length: 129.9

Actuated Cycle Length: 107

Natural Cycle: 130

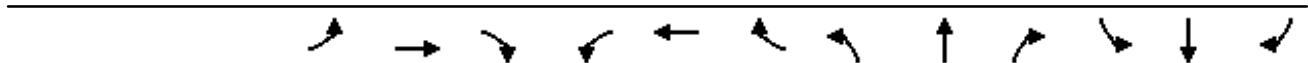
Control Type: Actuated-Uncoordinated

Splits and Phases: 18: SR-162 (Orting Hwy) & Pioneer Way E/Bowman Hilton Rd



HCM 2010 Signalized Intersection Summary  
 18: SR-162 (Orting Hwy) & Pioneer Way E/Bowman Hilton Rd

1/21/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↖		↖	↗	
Volume (veh/h)	88	17	388	6	8	21	216	398	2	27	878	63
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1776	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	92	18	347	6	8	22	225	415	2	28	915	66
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	7	7	7	3	3	3	3	3	3
Cap, veh/h	307	55	562	67	89	187	255	1293	6	559	884	64
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.15	0.70	0.70	0.52	0.52	0.52
Sat Flow, veh/h	1214	269	1599	149	431	911	1757	1834	9	956	1700	123
Grp Volume(v), veh/h	110	0	347	36	0	0	225	0	417	28	0	981
Grp Sat Flow(s),veh/h/ln	1483	0	1599	1490	0	0	1757	0	1843	956	0	1823
Q Serve(g_s), s	4.8	0.0	20.8	0.0	0.0	0.0	14.5	0.0	10.0	1.7	0.0	60.0
Cycle Q Clear(g_c), s	6.9	0.0	20.8	2.1	0.0	0.0	14.5	0.0	10.0	1.7	0.0	60.0
Prop In Lane	0.84		1.00	0.17		0.61	1.00		0.00	1.00		0.07
Lane Grp Cap(c), veh/h	363	0	562	343	0	0	255	0	1299	559	0	947
V/C Ratio(X)	0.30	0.00	0.62	0.10	0.00	0.00	0.88	0.00	0.32	0.05	0.00	1.04
Avail Cap(c_a), veh/h	441	0	648	420	0	0	380	0	1299	559	0	947
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	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.0	0.0	31.0	37.2	0.0	0.0	48.4	0.0	6.5	13.7	0.0	27.7
Incr Delay (d2), s/veh	0.3	0.0	1.1	0.1	0.0	0.0	13.2	0.0	0.1	0.0	0.0	38.8
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(0%),veh/ln	3.0	0.0	9.3	0.9	0.0	0.0	8.0	0.0	5.0	0.5	0.0	40.2
LnGrp Delay(d),s/veh	39.4	0.0	32.2	37.3	0.0	0.0	61.5	0.0	6.6	13.8	0.0	66.5
LnGrp LOS	D		C	D			E		A	B		F

Approach Vol, veh/h		457			36			642			1009	
Approach Delay, s/veh		33.9			37.3			25.9			65.0	
Approach LOS		C			D			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		87.1		28.4	21.4	65.7		28.4
Change Period (Y+Rc), s		5.7		4.6	4.6	5.7		4.6
Max Green Setting (Gmax), s		60.0		30.0	25.0	60.0		30.0
Max Q Clear Time (g_c+1), s		12.0		22.8	16.5	62.0		4.1
Green Ext Time (p_c), s		17.9		1.0	0.3	0.0		1.6

Intersection Summary		
HCM 2010 Ctrl Delay		46.2
HCM 2010 LOS		D

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

Lanes, Volumes, Timings  
19: Shaw Rd & 23rd Ave SE

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	
Volume (vph)	104	59	49	33	35	20	36	471	59	19	1090	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			3%			-3%			6%	
Storage Length (ft)	100		0	100		0	200		0	250		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1320			1104			4316			2299	
Travel Time (s)		36.0			30.1			84.1			44.8	
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 (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
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	0.97	0.97	0.97	1.02	1.02	1.02	0.98	0.98	0.98	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	22.5	22.5		21.5	21.5		8.5	18.5		8.5	18.5	
Total Split (s)	25.5	25.5		25.5	25.5		17.5	61.5		17.5	61.5	
Total Split (%)	24.4%	24.4%		24.4%	24.4%		16.7%	58.9%		16.7%	58.9%	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lead		Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary

Area Type: Other  
 Cycle Length: 104.5  
 Actuated Cycle Length: 93.3  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated



















Splits and Phases: 19: Shaw Rd & 23rd Ave SE



# HCM 2010 Signalized Intersection Summary

## 19: Shaw Rd & 23rd Ave SE

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	104	59	49	33	35	20	36	471	59	19	1090	111
Number	7	4	14	3	8	18	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1948	1909	1948	1872	1817	1872	1891	1891	1928	1825	1825	1843
Adj Flow Rate, veh/h	107	61	51	34	36	21	37	486	61	20	1124	114
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
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, %	2	2	2	3	3	3	2	2	2	1	1	1
Cap, veh/h	180	82	61	125	122	57	49	539	68	623	1074	109
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.03	0.33	0.33	0.36	0.66	0.66
Sat Flow, veh/h	745	516	383	428	769	359	1801	1647	207	1738	1630	165
Grp Volume(v), veh/h	219	0	0	91	0	0	37	0	547	20	0	1238
Grp Sat Flow(s),veh/h/ln	1644	0	0	1557	0	0	1801	0	1854	1738	0	1796
Q Serve(g_s), s	6.9	0.0	0.0	0.0	0.0	0.0	1.8	0.0	24.4	0.6	0.0	57.0
Cycle Q Clear(g_c), s	11.0	0.0	0.0	4.1	0.0	0.0	1.8	0.0	24.4	0.6	0.0	57.0
Prop In Lane	0.49		0.23	0.37		0.23	1.00		0.11	1.00		0.09
Lane Grp Cap(c), veh/h	322	0	0	303	0	0	49	0	607	623	0	1183
V/C Ratio(X)	0.68	0.00	0.00	0.30	0.00	0.00	0.75	0.00	0.90	0.03	0.00	1.05
Avail Cap(c_a), veh/h	453	0	0	430	0	0	270	0	1221	623	0	1183
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.1	0.0	0.0	32.4	0.0	0.0	41.8	0.0	27.8	18.0	0.0	14.8
Incr Delay (d2), s/veh	2.5	0.0	0.0	0.5	0.0	0.0	20.6	0.0	5.2	0.0	0.0	39.3
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(0%),veh/ln	5.3	0.0	0.0	2.0	0.0	0.0	1.2	0.0	13.3	0.3	0.0	40.5
LnGrp Delay(d),s/veh	37.6	0.0	0.0	32.9	0.0	0.0	62.4	0.0	33.0	18.0	0.0	54.1
LnGrp LOS	D			C			E		C	B		F
Approach Vol, veh/h		219			91			584			1258	
Approach Delay, s/veh		37.6			32.9			34.8			53.5	
Approach LOS		D			C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	61.5		18.2	35.5	32.8		18.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	13.0	57.0		21.0	13.0	57.0		21.0				
Max Q Clear Time (g_c+1), s	3.8	59.0		13.0	2.6	26.4		6.1				
Green Ext Time (p_c), s	0.0	0.0		0.7	4.9	2.0		0.9				

### Intersection Summary

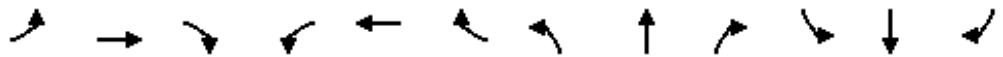
HCM 2010 Ctrl Delay	46.0
HCM 2010 LOS	D

### Notes

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

Lanes, Volumes, Timings  
 20: Shaw Rd E/Shaw Rd & 39th Ave SE

1/21/2016

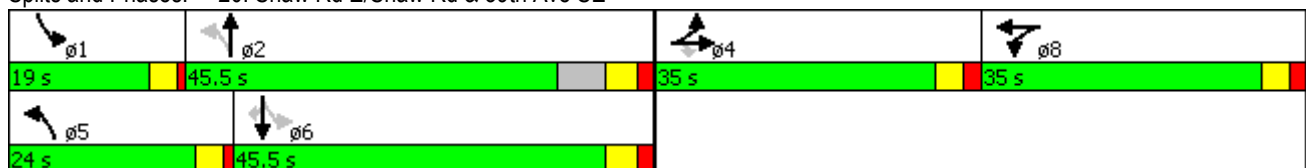


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	↔
Volume (vph)	269	4	454	2	2	4	309	409	5	1	833	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	280		0	150		500
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2283			612			552			915	
Travel Time (s)		44.5			11.9			10.8			17.8	
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 (%)	0%	0%	0%	14%	14%	14%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)												
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
Turn Type	Split	NA	Perm	Split	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4				2			6		6
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0		8.0	22.5		8.0	22.5	22.5
Total Split (s)	35.0	35.0	35.0	35.0	35.0		24.0	45.5		19.0	45.5	45.5
Total Split (%)	25.1%	25.1%	25.1%	25.1%	25.1%		17.2%	32.6%		13.6%	32.6%	32.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0		4.0	5.5		4.0	5.5	5.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		None	Min	Min

Intersection Summary





















Area Type: Other  
 Cycle Length: 139.5  
 Actuated Cycle Length: 98.4  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 20: Shaw Rd E/Shaw Rd & 39th Ave SE














HCM 2010 Signalized Intersection Summary  
 20: Shaw Rd E/Shaw Rd & 39th Ave SE

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	269	4	454	2	2	4	309	409	5	1	833	241
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1667	1900	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	286	4	133	2	2	4	329	435	5	1	886	0
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	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
Percent Heavy Veh, %	0	0	0	14	14	14	1	1	1	2	2	2
Cap, veh/h	338	5	306	3	3	6	369	1098	13	486	801	681
Arrive On Green	0.19	0.19	0.19	0.01	0.01	0.01	0.16	0.59	0.59	0.00	0.43	0.00
Sat Flow, veh/h	1786	25	1615	379	379	757	1792	1856	21	1774	1863	1583
Grp Volume(v), veh/h	290	0	133	8	0	0	329	0	440	1	886	0
Grp Sat Flow(s),veh/h/ln	1811	0	1615	1514	0	0	1792	0	1877	1774	1863	1583
Q Serve(g_s), s	14.4	0.0	6.8	0.5	0.0	0.0	12.6	0.0	11.6	0.0	40.0	0.0
Cycle Q Clear(g_c), s	14.4	0.0	6.8	0.5	0.0	0.0	12.6	0.0	11.6	0.0	40.0	0.0
Prop In Lane	0.99		1.00	0.25		0.50	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	343	0	306	12	0	0	369	0	1111	486	801	681
V/C Ratio(X)	0.85	0.00	0.44	0.66	0.00	0.00	0.89	0.00	0.40	0.00	1.11	0.00
Avail Cap(c_a), veh/h	584	0	521	489	0	0	463	0	1111	770	801	681
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	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.4	0.0	33.3	46.0	0.0	0.0	27.9	0.0	10.1	15.0	26.5	0.0
Incr Delay (d2), s/veh	5.8	0.0	1.0	47.1	0.0	0.0	16.4	0.0	0.2	0.0	64.7	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(0%),veh/ln	7.7	0.0	3.1	0.4	0.0	0.0	9.9	0.0	6.1	0.0	34.9	0.0
LnGrp Delay(d),s/veh	42.1	0.0	34.3	93.1	0.0	0.0	44.4	0.0	10.3	15.0	91.2	0.0
LnGrp LOS	D		C	F			D		B	B	F	
Approach Vol, veh/h		423			8			769			887	
Approach Delay, s/veh		39.7			93.1			24.9			91.1	
Approach LOS		D			F			C			F	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.1	60.5		22.6	19.1	45.5		5.7				
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0				
Max Green Setting (Gmax), s	15.0	40.0		30.0	20.0	40.0		30.0				
Max Q Clear Time (g_c+1), s	2.0	13.6		16.4	14.6	42.0		2.5				
Green Ext Time (p_c), s	0.0	5.7		1.2	0.5	0.0		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			56.3									
HCM 2010 LOS			E									

Lanes, Volumes, Timings  
 21: Shaw Rd & Site Access

2/4/2016

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	24	50	571	9	18	1245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500	0		0	200	
Storage Lanes	1	1		0	1	
Taper Length (ft)	50				50	
Link Speed (mph)	30		35			35
Link Distance (ft)	1206		893			1499
Travel Time (s)	27.4		17.4			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other  
 Control Type: Unsignalized



**Intersection**

Int Delay, s/veh 0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	24	50	571	9	18	1245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	500	0	-	-	200	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	56	634	10	20	1383

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1371	322	0 0 644 0
Stage 1	639	-	- - - -
Stage 2	732	-	- - - -
Critical Hdwy	6.84	6.94	- - 4.14 -
Critical Hdwy Stg 1	5.84	-	- - - -
Critical Hdwy Stg 2	5.84	-	- - - -
Follow-up Hdwy	3.52	3.32	- - 2.22 -
Pot Cap-1 Maneuver	137	674	- - 937 -
Stage 1	488	-	- - - -
Stage 2	437	-	- - - -
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	134	674	- - 937 -
Mov Cap-2 Maneuver	269	-	- - - -
Stage 1	488	-	- - - -
Stage 2	428	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	269	674	937	-
HCM Lane V/C Ratio	-	-	0.099	0.082	0.021	-
HCM Control Delay (s)	-	-	19.9	10.8	8.9	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.3	0.1	-

Lanes, Volumes, Timings  
 22: 33rd St SE & 80th St E

1/21/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	138	1	6	59	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30		30			25
Link Distance (ft)	1192		178			687
Travel Time (s)	27.1		4.0			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
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

# HCM Unsignalized Intersection Capacity Analysis

## 22: 33rd St SE & 80th St E

1/21/2016



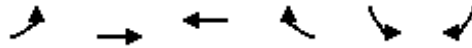
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			T
Volume (veh/h)	138	1	6	59	0	19
Sign Control	Free		Stop			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	153	1	7	66	0	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		308	0	376	307
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		308	0	376	307
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		99	94	100	96
cM capacity (veh/h)	1623		549	1085	502	549

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	154	72	21
Volume Left	153	0	0
Volume Right	1	66	0
cSH	1623	995	549
Volume to Capacity	0.09	0.07	0.04
Queue Length 95th (ft)	8	6	3
Control Delay (s)	7.4	8.9	11.8
Lane LOS	A	A	B
Approach Delay (s)	7.4	8.9	11.8
Approach LOS		A	B

Intersection Summary			
Average Delay		8.2	
Intersection Capacity Utilization		18.3%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings  
 23: E Pioneer & 33rd St SE

1/21/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	↙
Volume (vph)	51	532	272	6	10	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35	35		25	
Link Distance (ft)		1301	586		178	
Travel Time (s)		25.3	11.4		4.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

**Intersection**

Int Delay, s/veh 2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	51	532	272	6	10	145
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	55	572	292	6	11	156

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	299	0	978
Stage 1	-	-	296
Stage 2	-	-	682
Critical Hdwy	4.12	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.218	-	3.509
Pot Cap-1 Maneuver	1262	-	279
Stage 1	-	-	757
Stage 2	-	-	504
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1262	-	261
Mov Cap-2 Maneuver	-	-	261
Stage 1	-	-	757
Stage 2	-	-	472

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1262	-	-	-	666
HCM Lane V/C Ratio	0.043	-	-	-	0.25
HCM Control Delay (s)	8	0	-	-	12.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

## 2021 With-Project LOS

# Lanes, Volumes, Timings

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↗	↖	↖	↗	↖
Volume (vph)	177	34	299	71	81	21	314	814	125	6	206	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	225		0	100		75	110		150
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		381			354			642			1178	
Travel Time (s)		8.7			8.0			12.5			22.9	
Confl. Peds. (#/hr)									1	1		
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%	4%	4%	4%	6%	6%	6%	10%	10%	10%
Shared Lane Traffic (%)												
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
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		8			4		1	6				2
Permitted Phases	8			4			6		6	2		2
Detector Phase	8	8		4	4		1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.6	10.6		10.6	10.6		9.0	25.6	25.6	14.6	14.6	14.6
Total Split (s)	31.0	31.0		31.0	31.0		14.0	49.0	49.0	35.0	35.0	35.0
Total Split (%)	38.8%	38.8%		38.8%	38.8%		17.5%	61.3%	61.3%	43.8%	43.8%	43.8%
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	3.6
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)		4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	C-Min	C-Min	C-Min

### Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated






















### Splits and Phases: 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St



# HCM 2010 Signalized Intersection Summary

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	177	34	299	71	81	21	314	814	125	6	206	163
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1845	1900	1827	1827	1900	1792	1792	1792	1727	1727	1727
Adj Flow Rate, veh/h	182	35	308	73	84	22	324	839	129	6	212	168
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
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	4	4	4	6	6	6	10	10	10
Cap, veh/h	206	39	263	309	461	121	572	995	845	158	656	557
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.08	0.37	0.37	0.38	0.38	0.38
Sat Flow, veh/h	441	120	796	1013	1397	366	1707	1792	1522	536	1727	1466
Grp Volume(v), veh/h	525	0	0	73	0	106	324	839	129	6	212	168
Grp Sat Flow(s),veh/h/ln	1358	0	0	1013	0	1762	1707	1792	1522	536	1727	1466
Q Serve(g_s), s	23.0	0.0	0.0	0.0	0.0	3.4	8.7	34.3	4.5	0.8	6.9	6.4
Cycle Q Clear(g_c), s	26.4	0.0	0.0	6.6	0.0	3.4	8.7	34.3	4.5	21.1	6.9	6.4
Prop In Lane	0.35		0.59	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	509	0	0	309	0	582	572	995	845	158	656	557
V/C Ratio(X)	1.03	0.00	0.00	0.24	0.00	0.18	0.57	0.84	0.15	0.04	0.32	0.30
Avail Cap(c_a), veh/h	509	0	0	309	0	582	572	995	845	158	656	557
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	0.0	20.2	0.0	19.1	12.5	21.9	12.6	30.9	17.5	17.4
Incr Delay (d2), s/veh	48.5	0.0	0.0	0.4	0.0	0.1	0.6	4.4	0.2	0.4	1.3	1.4
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(0%),veh/ln	18.0	0.0	0.0	1.3	0.0	1.7	4.1	18.1	1.9	0.1	3.5	2.8
LnGrp Delay(d),s/veh	77.6	0.0	0.0	20.6	0.0	19.3	13.1	26.3	12.8	31.3	18.8	18.8
LnGrp LOS	F			C		B	B	C	B	C	B	B
Approach Vol, veh/h		525			179			1292			386	
Approach Delay, s/veh		77.6			19.8			21.7			19.0	
Approach LOS		E			B			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	14.0	35.0		31.0		49.0		31.0				
Change Period (Y+Rc), s	4.6	4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s	9.4	30.4		26.4		44.4		26.4				
Max Q Clear Time (g_c+1), s	10.7	23.1		8.6		36.3		28.4				
Green Ext Time (p_c), s	0.0	3.4		2.8		3.6		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				33.4								
HCM 2010 LOS				C								



# Lanes, Volumes, Timings

## 4: E Main & SR 410 EB Ramps

1/21/2016

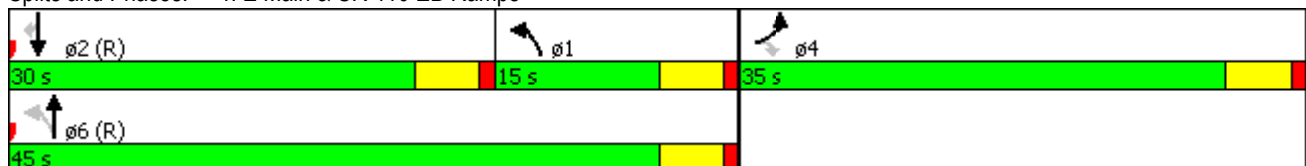


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	424	450	160	792	518	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75	0	175			75
Storage Lanes	1	1	1			1
Taper Length (ft)	50		50			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			35	35	
Link Distance (ft)	516			1317	642	
Travel Time (s)	11.7			25.7	12.5	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	9%	9%	4%	4%	4%	4%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		1	6	2	
Permitted Phases		4	6			2
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	15.0	15.0	15.0
Total Split (s)	35.0	35.0	15.0	45.0	30.0	30.0
Total Split (%)	43.8%	43.8%	18.8%	56.3%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	Min	Min	None	C-Max	C-Max	C-Max

### Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated













### Splits and Phases: 4: E Main & SR 410 EB Ramps



# HCM 2010 Signalized Intersection Summary

## 4: E Main & SR 410 EB Ramps

1/21/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	424	450	160	792	518	57		
Number	7	14	1	6	2	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1743	1743	1827	1827	1827	1827		
Adj Flow Rate, veh/h	437	294	165	816	534	0		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Percent Heavy Veh, %	9	9	4	4	4	4		
Cap, veh/h	503	449	436	1045	571	485		
Arrive On Green	0.30	0.30	0.20	0.57	0.31	0.00		
Sat Flow, veh/h	1660	1482	1740	1827	1827	1553		
Grp Volume(v), veh/h	437	294	165	816	534	0		
Grp Sat Flow(s),veh/h/ln	1660	1482	1740	1827	1827	1553		
Q Serve(g_s), s	19.9	13.8	2.0	27.6	22.7	0.0		
Cycle Q Clear(g_c), s	19.9	13.8	2.0	27.6	22.7	0.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	503	449	436	1045	571	485		
V/C Ratio(X)	0.87	0.65	0.38	0.78	0.94	0.00		
Avail Cap(c_a), veh/h	623	556	436	1045	571	485		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.96	0.00		
Uniform Delay (d), s/veh	26.4	24.2	26.0	13.2	26.7	0.0		
Incr Delay (d2), s/veh	11.1	2.3	0.5	5.8	23.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	10.7	5.9	3.1	15.5	15.2	0.0		
LnGrp Delay(d),s/veh	37.5	26.5	26.6	19.1	50.6	0.0		
LnGrp LOS	D	C	C	B	D			
Approach Vol, veh/h	731			981	534			
Approach Delay, s/veh	33.1			20.3	50.6			
Approach LOS	C			C	D			
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	20.7	30.0		29.3		50.7		
Change Period (Y+Rc), s	5.0	5.0		5.0		5.0		
Max Green Setting (Gmax), s	10.0	25.0		30.0		40.0		
Max Q Clear Time (g_c+I1), s	4.0	24.7		21.9		29.6		
Green Ext Time (p_c), s	2.2	0.1		2.3		3.0		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			31.7					
HCM 2010 LOS			C					

Lanes, Volumes, Timings  
21: Shaw Rd & Site Access

1/22/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	37	134	1148	113	399	428
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500	0		0	200	
Storage Lanes	1	1		0	1	
Taper Length (ft)	50				50	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		35			35
Link Distance (ft)	1343		893			1499
Travel Time (s)	30.5		17.4			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
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	
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	22.6	22.6	22.6		8.6	22.6
Total Split (s)	22.6	22.6	39.8		27.6	67.4
Total Split (%)	25.1%	25.1%	44.2%		30.7%	74.9%
Yellow Time (s)	3.6	3.6	3.6		3.6	3.6
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6		4.6	4.6
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Recall Mode	None	None	Min		None	Min

Intersection Summary












Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	79.6
Natural Cycle:	90
Control Type:	Actuated-Uncoordinated

Splits and Phases: 21: Shaw Rd & Site Access



HCM 2010 Signalized Intersection Summary  
 21: Shaw Rd & Site Access

1/22/2016

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	37	134	1148	113	399	428		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863		
Adj Flow Rate, veh/h	41	0	1276	126	443	476		
Adj No. of Lanes	1	1	2	0	1	2		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	56	50	1573	155	496	2942		
Arrive On Green	0.03	0.00	0.48	0.48	0.28	0.83		
Sat Flow, veh/h	1774	1583	3349	320	1774	3632		
Grp Volume(v), veh/h	41	0	692	710	443	476		
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1806	1774	1770		
Q Serve(g_s), s	1.5	0.0	22.3	22.5	16.1	1.8		
Cycle Q Clear(g_c), s	1.5	0.0	22.3	22.5	16.1	1.8		
Prop In Lane	1.00	1.00		0.18	1.00			
Lane Grp Cap(c), veh/h	56	50	855	873	496	2942		
V/C Ratio(X)	0.73	0.00	0.81	0.81	0.89	0.16		
Avail Cap(c_a), veh/h	475	424	927	946	607	3306		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	32.3	0.0	14.7	14.8	23.2	1.1		
Incr Delay (d2), s/veh	16.1	0.0	5.1	5.2	13.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	1.0	0.0	12.0	12.3	9.8	0.9		
LnGrp Delay(d),s/veh	48.4	0.0	19.8	20.0	36.9	1.1		
LnGrp LOS	D		B	B	D	A		
Approach Vol, veh/h	41		1402			919		
Approach Delay, s/veh	48.4		19.9			18.4		
Approach LOS	D		B			B		
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	23.4	37.1				60.5		6.7
Change Period (Y+Rc), s	4.6	4.6				4.6		4.6
Max Green Setting (Gmax), s	23.0	35.2				62.8		18.0
Max Q Clear Time (g_c+I1), s	18.1	24.5				3.8		3.5
Green Ext Time (p_c), s	0.7	8.0				21.9		0.0
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			19.8					
HCM 2010 LOS			B					

Lanes, Volumes, Timings  
 22: 33rd St SE & 80th St E

1/21/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	96	10	112	36	3	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30		30			25
Link Distance (ft)	1192		178			687
Travel Time (s)	27.1		4.0			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
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

# HCM Unsignalized Intersection Capacity Analysis

## 22: 33rd St SE & 80th St E

1/21/2016



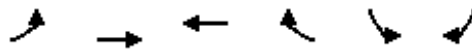
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	96	10	112	36	3	38
Sign Control	Free		Stop			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	107	11	124	40	3	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		224	0	321	219
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		224	0	321	219
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 %	93		80	96	99	93
cM capacity (veh/h)	1623		630	1085	491	635

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	118	164	46
Volume Left	107	0	3
Volume Right	11	40	0
cSH	1623	702	621
Volume to Capacity	0.07	0.23	0.07
Queue Length 95th (ft)	5	23	6
Control Delay (s)	6.7	11.7	11.3
Lane LOS	A	B	B
Approach Delay (s)	6.7	11.7	11.3
Approach LOS		B	B

Intersection Summary			
Average Delay		9.8	
Intersection Capacity Utilization		20.7%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings  
 23: E Pioneer & 33rd St SE

1/21/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	123	209	385	23	8	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35	35		25	
Link Distance (ft)		1301	586		178	
Travel Time (s)		25.3	11.4		4.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

**Intersection**

Int Delay, s/veh 3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	123	209	385	23	8	128
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	132	225	414	25	9	138

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	439	0	915
Stage 1	-	-	426
Stage 2	-	-	489
Critical Hdwy	4.12	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.218	-	3.509
Pot Cap-1 Maneuver	1121	-	304
Stage 1	-	-	661
Stage 2	-	-	619
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1121	-	263
Mov Cap-2 Maneuver	-	-	263
Stage 1	-	-	661
Stage 2	-	-	535

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1121	-	-	-	583
HCM Lane V/C Ratio	0.118	-	-	-	0.251
HCM Control Delay (s)	8.6	0	-	-	13.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1



# Lanes, Volumes, Timings

## 1: N Meridian & Valley Ave NW/Valley Ave NE

1/21/2016

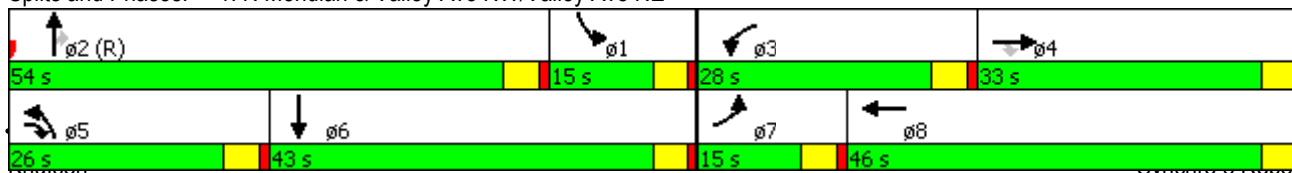


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	578	694	466	156	41	373	567	253	59	938	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			1%			1%	
Storage Length (ft)	250		350	300		0	250		200	200		0
Storage Lanes	1		2	2		0	2		1	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			No			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2026			370			394			1045	
Travel Time (s)		39.5			7.2			7.7			20.4	
Confl. Peds. (#/hr)			3			9			1			5
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 (%)	9%	9%	9%	5%	5%	5%	5%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
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)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4						2			
Detector Phase	7	4	4 5	3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	8.0	4.0	4.0	8.0		4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	8.6	31.6	8.6	8.6	31.6		8.6	31.6	31.6	8.6	37.6	
Total Split (s)	15.0	33.0	26.0	28.0	46.0		26.0	54.0	54.0	15.0	43.0	
Total Split (%)	11.5%	25.4%	20.0%	21.5%	35.4%		20.0%	41.5%	41.5%	11.5%	33.1%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6	3.6	3.6	3.6	
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	0.0	
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	4.6	4.6	4.6	4.6	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	None	Min	

### Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

### Splits and Phases: 1: N Meridian & Valley Ave NW/Valley Ave NE


























2021 With Project - PM Peak Hour

Dynamic Report

# HCM 2010 Signalized Intersection Summary

## 1: N Meridian & Valley Ave NW/Valley Ave NE

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	578	694	466	156	41	373	567	253	59	938	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	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
Adj Sat Flow, veh/h/ln	1734	1734	1734	1800	1800	1890	1800	1800	1800	1853	1853	1890
Adj Flow Rate, veh/h	45	590	708	476	159	0	381	579	0	60	957	0
Adj No. of Lanes	1	2	2	2	2	0	2	2	1	1	2	0
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, %	9	9	9	5	5	5	5	5	5	2	2	2
Cap, veh/h	57	720	911	534	1179	0	446	1300	582	176	1216	0
Arrive On Green	0.03	0.22	0.22	0.16	0.34	0.00	0.04	0.13	0.00	0.10	0.35	0.00
Sat Flow, veh/h	1652	3295	2577	3327	3511	0	3327	3421	1530	1765	3614	0
Grp Volume(v), veh/h	45	590	708	476	159	0	381	579	0	60	957	0
Grp Sat Flow(s),veh/h/ln	1652	1648	1288	1663	1710	0	1663	1710	1530	1765	1761	0
Q Serve(g_s), s	3.5	22.2	28.4	18.2	4.2	0.0	14.8	20.4	0.0	4.1	31.8	0.0
Cycle Q Clear(g_c), s	3.5	22.2	28.4	18.2	4.2	0.0	14.8	20.4	0.0	4.1	31.8	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	57	720	911	534	1179	0	446	1300	582	176	1216	0
V/C Ratio(X)	0.80	0.82	0.78	0.89	0.13	0.00	0.85	0.45	0.00	0.34	0.79	0.00
Avail Cap(c_a), veh/h	132	720	911	599	1179	0	548	1300	582	176	1216	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	1.00	0.00	0.91	0.91	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	62.3	48.4	37.6	53.5	29.3	0.0	60.9	44.2	0.0	54.6	38.2	0.0
Incr Delay (d2), s/veh	15.2	5.1	2.9	14.5	0.1	0.0	9.8	1.0	0.0	1.1	3.5	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(0%),veh/ln	1.9	10.6	11.7	9.5	2.0	0.0	7.4	9.8	0.0	2.1	16.0	0.0
LnGrp Delay(d),s/veh	77.6	53.4	40.5	68.0	29.3	0.0	70.6	45.2	0.0	55.7	41.8	0.0
LnGrp LOS	E	D	D	E	C		E	D		E	D	
Approach Vol, veh/h		1343			635			960			1017	
Approach Delay, s/veh		47.4			58.3			55.3			42.6	
Approach LOS		D			E			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.5	54.0	25.5	33.0	22.0	49.5	9.1	49.4				
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6				
Max Green Setting (Gmax), s	10.4	49.4	23.4	28.4	21.4	38.4	10.4	41.4				
Max Q Clear Time (g_c+1), s	6.1	22.4	20.2	30.4	16.8	33.8	5.5	6.2				
Green Ext Time (p_c), s	1.3	2.3	0.6	0.0	0.6	1.9	0.0	7.5				

### Intersection Summary

HCM 2010 Ctrl Delay	49.8
HCM 2010 LOS	D

### Notes

User approved changes to right turn type.

# Lanes, Volumes, Timings

## 2: N Meridian & SR 167 SB Off Ramp

1/21/2016

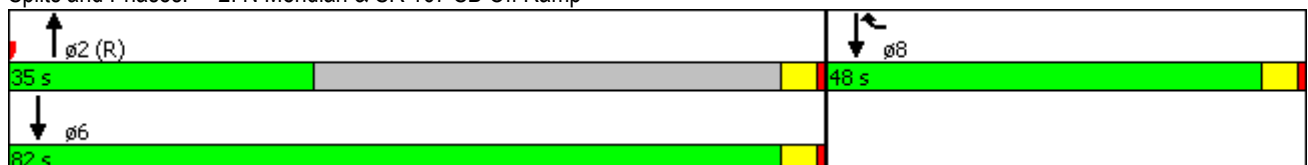


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø6
Lane Configurations		↗↗	↕			↖↖	
Volume (vph)	0	649	572	0	0	2104	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	400	0		0	0		
Storage Lanes	0	2		0	0		
Taper Length (ft)	50				50		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	158		482			394	
Travel Time (s)	3.6		11.0			9.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	
Heavy Vehicles (%)	7%	7%	4%	4%	4%	4%	
Shared Lane Traffic (%)							
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	0		24			24	
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		
Turn Type		Prot	NA			NA	
Protected Phases		8	2			6 8	6
Permitted Phases							
Detector Phase		8	2			6 8	
Switch Phase							
Minimum Initial (s)		6.0	10.0				10.0
Minimum Split (s)		10.6	22.6				14.6
Total Split (s)		48.0	35.0				82.0
Total Split (%)		36.9%	26.9%				63%
Yellow Time (s)		3.6	3.6				3.6
All-Red Time (s)		1.0	1.0				1.0
Lost Time Adjust (s)		0.0	0.0				
Total Lost Time (s)		4.6	4.6				
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode		None	C-Min				Min

### Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated

Splits and Phases: 2: N Meridian & SR 167 SB Off Ramp



# HCM Signalized Intersection Capacity Analysis

## 2: N Meridian & SR 167 SB Off Ramp

1/21/2016



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗↗	↕↕			↖↖
Volume (vph)	0	649	572	0	0	2104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6			4.6
Lane Util. Factor		0.88	0.95			0.95
Frt		0.85	1.00			1.00
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		2656	3471			3471
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		2656	3471			3471
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	656	578	0	0	2125
RTOR Reduction (vph)	0	388	0	0	0	0
Lane Group Flow (vph)	0	268	578	0	0	2125
Heavy Vehicles (%)	7%	7%	4%	4%	4%	4%
Turn Type		Prot	NA			NA
Protected Phases		8	2			6 8
Permitted Phases						
Actuated Green, G (s)		37.4	83.4			130.0
Effective Green, g (s)		37.4	83.4			130.0
Actuated g/C Ratio		0.29	0.64			1.00
Clearance Time (s)		4.6	4.6			
Vehicle Extension (s)		3.0	2.8			
Lane Grp Cap (vph)		764	2226			3471
v/s Ratio Prot		0.10	0.17			c0.61
v/s Ratio Perm						
v/c Ratio		0.35	0.26			0.61
Uniform Delay, d1		36.7	10.0			0.0
Progression Factor		1.00	0.54			1.00
Incremental Delay, d2		0.3	0.2			0.2
Delay (s)		37.0	5.6			0.2
Level of Service		D	A			A
Approach Delay (s)	37.0		5.6			0.2
Approach LOS	D		A			A

### Intersection Summary

HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.2
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Lanes, Volumes, Timings

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

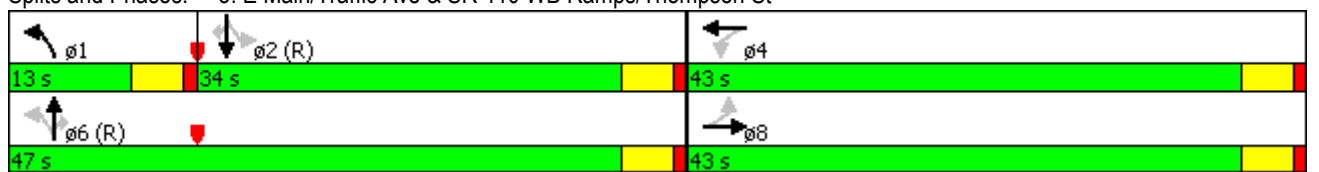


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗		↖	↗	↖	↖	↗	↖
Volume (vph)	70	21	292	284	132	45	393	460	245	7	433	598
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	225		0	100		75	110		150
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		381			354			642			1178	
Travel Time (s)		8.7			8.0			12.5			22.9	
Confl. Peds. (#/hr)									8	8		
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 (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
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
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		8			4		1	6				2
Permitted Phases	8			4			6		6	2		2
Detector Phase	8	8		4	4		1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.6	10.6		10.6	10.6		9.0	25.6	25.6	14.6	14.6	14.6
Total Split (s)	43.0	43.0		43.0	43.0		13.0	47.0	47.0	34.0	34.0	34.0
Total Split (%)	47.8%	47.8%		47.8%	47.8%		14.4%	52.2%	52.2%	37.8%	37.8%	37.8%
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	3.6
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)		4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	C-Min	C-Min	C-Min

### Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated






















Splits and Phases: 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St



# HCM 2010 Signalized Intersection Summary

## 3: E Main/Traffic Ave & SR 410 WB Ramps/Thompson St

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	21	292	284	132	45	393	460	245	7	433	598
Number	3	8	18	7	4	14	1	6	16	5	2	12
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		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	74	22	307	299	139	47	414	484	258	7	456	629
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
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, %	2	2	2	2	2	2	3	3	3	3	3	3
Cap, veh/h	135	63	481	405	547	185	309	899	758	295	632	531
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.09	0.49	0.49	0.34	0.34	0.34
Sat Flow, veh/h	213	153	1170	1047	1333	451	1757	1845	1555	705	1845	1550
Grp Volume(v), veh/h	403	0	0	299	0	186	414	484	258	7	456	629
Grp Sat Flow(s),veh/h/ln	1536	0	0	1047	0	1783	1757	1845	1555	705	1845	1550
Q Serve(g_s), s	9.9	0.0	0.0	15.5	0.0	6.2	8.4	16.4	9.2	0.6	19.4	30.8
Cycle Q Clear(g_c), s	18.4	0.0	0.0	33.9	0.0	6.2	8.4	16.4	9.2	4.0	19.4	30.8
Prop In Lane	0.18		0.76	1.00		0.25	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	678	0	0	405	0	732	309	899	758	295	632	531
V/C Ratio(X)	0.59	0.00	0.00	0.74	0.00	0.25	1.34	0.54	0.34	0.02	0.72	1.18
Avail Cap(c_a), veh/h	702	0	0	421	0	761	309	899	758	295	632	531
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	0.61	0.61	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	0.0	0.0	28.4	0.0	17.5	24.1	16.0	14.2	22.0	25.8	29.6
Incr Delay (d2), s/veh	1.3	0.0	0.0	6.5	0.0	0.2	165.9	1.4	0.7	0.1	7.0	100.8
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(0%),veh/ln	8.2	0.0	0.0	7.9	0.0	3.1	17.8	8.7	4.1	0.1	11.1	28.0
LnGrp Delay(d),s/veh	22.2	0.0	0.0	34.9	0.0	17.6	190.1	17.5	14.9	22.1	32.8	130.4
LnGrp LOS	C			C		B	F	B	B	C	C	F
Approach Vol, veh/h		403			485			1156			1092	
Approach Delay, s/veh		22.2			28.3			78.7			88.9	
Approach LOS		C			C			E			F	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	13.0	35.4		41.6		48.4		41.6				
Change Period (Y+Rc), s	4.6	4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s	8.4	29.4		38.4		42.4		38.4				
Max Q Clear Time (g_c+1), s	10.4	32.8		35.9		18.4		20.4				
Green Ext Time (p_c), s	0.0	0.0		1.1		8.2		3.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				67.2								
HCM 2010 LOS				E								

# Lanes, Volumes, Timings

## 4: E Main & SR 410 EB Ramps

1/21/2016

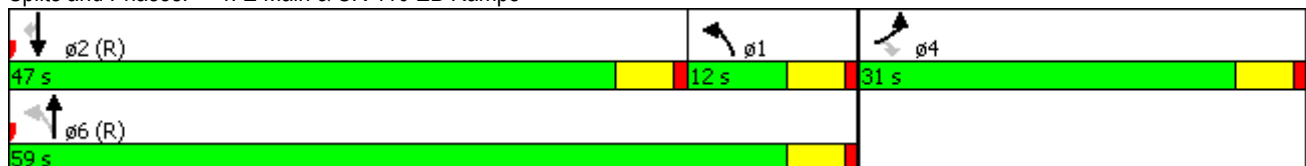


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	254	638	285	857	864	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75	0	175			75
Storage Lanes	1	1	1			1
Taper Length (ft)	50		50			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			35	35	
Link Distance (ft)	516			1317	642	
Travel Time (s)	11.7			25.7	12.5	
Confl. Peds. (#/hr)		7	1			1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		1	6	2	
Permitted Phases		4	6			2
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	15.0	15.0	15.0
Total Split (s)	31.0	31.0	12.0	59.0	47.0	47.0
Total Split (%)	34.4%	34.4%	13.3%	65.6%	52.2%	52.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max

### Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated













Splits and Phases: 4: E Main & SR 410 EB Ramps



# HCM 2010 Signalized Intersection Summary

## 4: E Main & SR 410 EB Ramps

1/21/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	254	638	285	857	864	158		
Number	7	14	1	6	2	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1845	1863	1863	1863	1863		
Adj Flow Rate, veh/h	262	355	294	884	891	0		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Percent Heavy Veh, %	3	3	2	2	2	2		
Cap, veh/h	447	399	279	1182	869	739		
Arrive On Green	0.25	0.25	0.11	0.63	0.47	0.00		
Sat Flow, veh/h	1757	1568	1774	1863	1863	1583		
Grp Volume(v), veh/h	262	355	294	884	891	0		
Grp Sat Flow(s),veh/h/ln	1757	1568	1774	1863	1863	1583		
Q Serve(g_s), s	11.8	19.6	10.1	29.7	42.0	0.0		
Cycle Q Clear(g_c), s	11.8	19.6	10.1	29.7	42.0	0.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	447	399	279	1182	869	739		
V/C Ratio(X)	0.59	0.89	1.05	0.75	1.02	0.00		
Avail Cap(c_a), veh/h	508	453	279	1182	869	739		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.33	0.00		
Uniform Delay (d), s/veh	29.4	32.3	38.5	11.4	24.0	0.0		
Incr Delay (d2), s/veh	1.6	18.2	68.5	4.4	24.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	5.9	10.5	12.2	16.4	27.3	0.0		
LnGrp Delay(d),s/veh	31.0	50.5	107.0	15.8	48.2	0.0		
LnGrp LOS	C	D	F	B	F			
Approach Vol, veh/h	617			1178	891			
Approach Delay, s/veh	42.2			38.6	48.2			
Approach LOS	D			D	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.1	47.0		27.9		62.1		
Change Period (Y+Rc), s	5.0	5.0		5.0		5.0		
Max Green Setting (Gmax), s	7.0	42.0		26.0		54.0		
Max Q Clear Time (g_c+I1), s	12.1	44.0		21.6		31.7		
Green Ext Time (p_c), s	0.0	0.0		1.3		4.9		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			42.6					
HCM 2010 LOS			D					



# Lanes, Volumes, Timings

## 5: Shaw Rd & E Main

1/21/2016

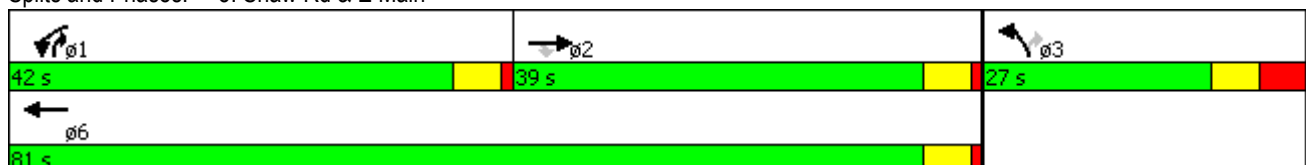


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑
Volume (vph)	413	387	1023	610	215	732
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		350	475		200	0
Storage Lanes		1	1		1	2
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	35	
Link Distance (ft)	488			1553	1499	
Travel Time (s)	9.5			30.3	29.2	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA	Perm	Prot	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases		2				3
Detector Phase	2	2	1	6	3	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	39.0	39.0	9.0	9.0	12.0	9.0
Total Split (s)	39.0	39.0	42.0	81.0	27.0	42.0
Total Split (%)	36.1%	36.1%	38.9%	75.0%	25.0%	38.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	4.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	8.0	5.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	None	None

### Intersection Summary

Area Type: Other  
 Cycle Length: 108  
 Actuated Cycle Length: 89.4  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Shaw Rd & E Main



# HCM 2010 Signalized Intersection Summary

## 5: Shaw Rd & E Main

1/21/2016

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↗	↑	↖	↖↗		
Volume (veh/h)	413	387	1023	610	215	732		
Number	2	12	1	6	3	18		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1881	1881	1881	1881		
Adj Flow Rate, veh/h	444	168	1100	656	231	648		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	1	1	1	1		
Cap, veh/h	842	376	1257	1242	328	1533		
Arrive On Green	0.24	0.24	0.36	0.66	0.18	0.18		
Sat Flow, veh/h	3632	1580	3476	1881	1792	2814		
Grp Volume(v), veh/h	444	168	1100	656	231	648		
Grp Sat Flow(s),veh/h/ln	1770	1580	1738	1881	1792	1407		
Q Serve(g_s), s	9.1	7.5	24.5	15.1	10.0	11.3		
Cycle Q Clear(g_c), s	9.1	7.5	24.5	15.1	10.0	11.3		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	842	376	1257	1242	328	1533		
V/C Ratio(X)	0.53	0.45	0.87	0.53	0.70	0.42		
Avail Cap(c_a), veh/h	1453	649	1553	1726	411	1664		
HCM Platoon Ratio	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		
Uniform Delay (d), s/veh	27.5	26.9	24.7	7.4	31.7	11.1		
Incr Delay (d2), s/veh	0.5	0.8	5.0	0.4	4.0	0.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	4.5	3.4	12.5	7.8	5.3	4.3		
LnGrp Delay(d),s/veh	28.0	27.7	29.7	7.7	35.7	11.3		
LnGrp LOS	C	C	C	A	D	B		
Approach Vol, veh/h	612			1756	879			
Approach Delay, s/veh	27.9			21.5	17.7			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	35.0	24.7				59.7		23.2
Change Period (Y+Rc), s	5.0	5.0				5.0		8.0
Max Green Setting (Gmax), s	37.0	34.0				76.0		19.0
Max Q Clear Time (g_c+1), s	26.5	11.1				17.1		13.3
Green Ext Time (p_c), s	3.5	8.5				10.4		1.9

### Intersection Summary

HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

### Notes

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

Lanes, Volumes, Timings  
6: 15th St SE/15th St NE & E Main

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	611	307	244	513	154	84	91	139	156	133	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		100	200		100	0		0	0		65
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3360			2256			1179			404	
Travel Time (s)		76.4			51.3			26.8			9.2	
Confl. Peds. (#/hr)	6		3	3		6	3		3	3		3
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 (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
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		Yes			Yes							
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
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	2.0	3.0	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	
Minimum Split (s)	6.5	18.5	18.5	6.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	
Total Split (s)	34.5	49.5	49.5	34.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	
Total Split (%)	25.8%	37.1%	37.1%	25.8%	37.1%	37.1%	37.1%	37.1%	37.1%	37.1%	37.1%	
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	
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	
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	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	

Intersection Summary























Area Type:	Other
Cycle Length:	133.5
Actuated Cycle Length:	87.8
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated

Splits and Phases: 6: 15th St SE/15th St NE & E Main



HCM 2010 Signalized Intersection Summary  
 6: 15th St SE/15th St NE & E Main

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	13	611	307	244	513	154	84	91	139	156	133	18
Number	5	2	12	1	6	16	3	8	18	7	4	14
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		0.99
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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1881	1900	1845	1845	1900	1881	1900
Adj Flow Rate, veh/h	13	630	316	252	529	159	87	94	0	161	137	19
Adj No. of Lanes	1	1	1	1	1	1	0	1	1	0	2	0
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, %	1	1	1	1	1	1	3	3	3	1	1	1
Cap, veh/h	417	828	701	423	1028	869	190	169	333	363	329	46
Arrive On Green	0.01	0.44	0.44	0.11	0.55	0.55	0.21	0.21	0.00	0.21	0.21	0.21
Sat Flow, veh/h	1792	1881	1592	1792	1881	1590	458	796	1568	1142	1549	219
Grp Volume(v), veh/h	13	630	316	252	529	159	181	0	0	172	0	145
Grp Sat Flow(s),veh/h/ln	1792	1881	1592	1792	1881	1590	1254	0	1568	1238	0	1671
Q Serve(g_s), s	0.2	16.3	8.0	3.9	10.3	2.9	4.1	0.0	0.0	0.0	0.0	4.3
Cycle Q Clear(g_c), s	0.2	16.3	8.0	3.9	10.3	2.9	8.5	0.0	0.0	7.6	0.0	4.3
Prop In Lane	1.00		1.00	1.00		1.00	0.48		1.00	0.94		0.13
Lane Grp Cap(c), veh/h	417	828	701	423	1028	869	359	0	333	384	0	355
V/C Ratio(X)	0.03	0.76	0.45	0.60	0.51	0.18	0.50	0.00	0.00	0.45	0.00	0.41
Avail Cap(c_a), veh/h	1334	1465	1240	1149	1465	1239	1192	0	1221	1138	0	1302
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.0	13.6	11.3	10.5	8.3	6.6	21.4	0.0	0.0	20.9	0.0	19.6
Incr Delay (d2), s/veh	0.0	1.5	0.5	1.3	0.4	0.1	1.1	0.0	0.0	0.8	0.0	0.8
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(0%),veh/ln	0.1	8.7	3.6	2.0	5.4	1.3	2.8	0.0	0.0	2.6	0.0	2.1
LnGrp Delay(d),s/veh	9.1	15.1	11.8	11.8	8.7	6.7	22.5	0.0	0.0	21.7	0.0	20.4
LnGrp LOS	A	B	B	B	A	A	C			C		C
Approach Vol, veh/h		959			940			181			317	
Approach Delay, s/veh		13.9			9.2			22.5			21.1	
Approach LOS		B			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	29.9		16.8	4.9	36.1		16.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	30.0	45.0		45.0	30.0	45.0		45.0				
Max Q Clear Time (g_c+1), s	5.9	18.3		9.6	2.2	12.3		10.5				
Green Ext Time (p_c), s	0.8	7.1		1.8	0.0	7.4		1.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				13.7								
HCM 2010 LOS				B								

Lanes, Volumes, Timings  
7: 5th St SE/5th St NE & E Main

1/21/2016

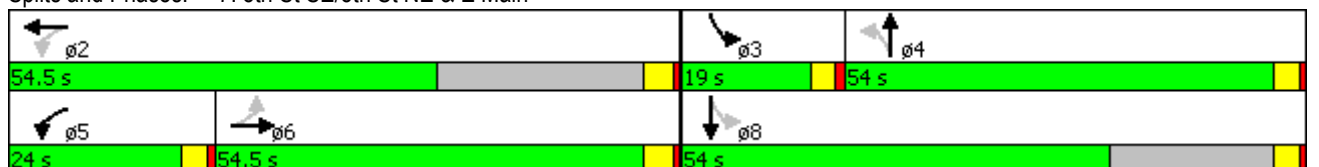


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	389	59	162	556	127	14	184	96	415	577	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	90		0	90		0	90		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		600			3360			543			901	
Travel Time (s)		16.4			76.4			12.3			20.5	
Confl. Peds. (#/hr)	2		3	3		2	2		1	1		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 (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
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		Yes			Yes							
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
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		6		5	2			4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		3	8	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	23.5	23.5		7.0	24.5		24.0	24.0		7.0	23.0	
Total Split (s)	54.5	54.5		24.0	54.5		54.0	54.0		19.0	54.0	
Total Split (%)	36.0%	36.0%		15.8%	36.0%		35.6%	35.6%		12.5%	35.6%	
Yellow Time (s)	3.5	3.5		3.0	3.5		3.0	3.0		3.0	3.0	
All-Red Time (s)	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		4.0	4.5		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?												
Recall Mode	Min	Min		None	Min		None	None		None	Max	

Intersection Summary





















Area Type:	Other
Cycle Length:	151.5
Actuated Cycle Length:	111.1
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated

Splits and Phases: 7: 5th St SE/5th St NE & E Main



HCM 2010 Signalized Intersection Summary  
 7: 5th St SE/5th St NE & E Main

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	389	59	162	556	127	14	184	96	415	577	47
Number	1	6	16	5	2	12	7	4	14	3	8	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		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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1845	1845	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	26	401	61	167	573	131	14	190	99	428	595	48
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
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, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	146	540	82	317	668	153	206	333	174	476	793	64
Arrive On Green	0.34	0.34	0.34	0.08	0.46	0.46	0.29	0.29	0.29	0.14	0.46	0.46
Sat Flow, veh/h	740	1579	240	1757	1453	332	791	1165	607	1792	1718	139
Grp Volume(v), veh/h	26	0	462	167	0	704	14	0	289	428	0	643
Grp Sat Flow(s),veh/h/ln	740	0	1819	1757	0	1785	791	0	1772	1792	0	1857
Q Serve(g_s), s	3.5	0.0	24.3	6.4	0.0	38.1	1.6	0.0	15.1	15.0	0.0	30.9
Cycle Q Clear(g_c), s	28.9	0.0	24.3	6.4	0.0	38.1	13.5	0.0	15.1	15.0	0.0	30.9
Prop In Lane	1.00		0.13	1.00		0.19	1.00		0.34	1.00		0.07
Lane Grp Cap(c), veh/h	146	0	622	317	0	821	206	0	507	476	0	857
V/C Ratio(X)	0.18	0.00	0.74	0.53	0.00	0.86	0.07	0.00	0.57	0.90	0.00	0.75
Avail Cap(c_a), veh/h	235	0	840	499	0	824	345	0	818	476	0	857
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	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.7	0.0	31.4	22.6	0.0	26.1	37.4	0.0	33.0	27.7	0.0	24.0
Incr Delay (d2), s/veh	0.7	0.0	2.7	1.6	0.0	9.1	0.2	0.0	1.2	19.9	0.0	6.0
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(0%),veh/ln	0.8	0.0	12.7	3.2	0.0	20.8	0.4	0.0	7.6	11.3	0.0	17.1
LnGrp Delay(d),s/veh	45.3	0.0	34.2	24.2	0.0	35.2	37.5	0.0	34.2	47.6	0.0	30.0
LnGrp LOS	D		C	C		D	D		C	D		C
Approach Vol, veh/h		488			871			303			1071	
Approach Delay, s/veh		34.7			33.1			34.3			37.0	
Approach LOS		C			C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		54.3	19.0	35.0	12.8	41.5		54.0				
Change Period (Y+Rc), s		4.5	4.0	4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s		50.0	15.0	50.0	20.0	50.0		50.0				
Max Q Clear Time (g_c+1), s		40.1	17.0	17.1	8.4	30.9		32.9				
Green Ext Time (p_c), s		4.4	0.0	5.1	0.5	6.2		4.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			35.1									
HCM 2010 LOS			D									

Lanes, Volumes, Timings  
8: 2nd St NE & E Stewart St/E Main

1/21/2016

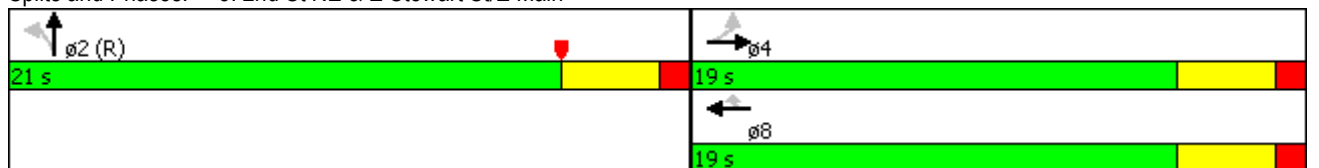


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	373	0	0	394	252	130	774	1	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			25				25
Link Distance (ft)		388			193			477				917
Travel Time (s)		8.8			4.4			13.0				25.0
Confl. Peds. (#/hr)	12					12	8		6			
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 (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	0%	0%	0%
Shared Lane Traffic (%)												
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
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Detector Phase	4	4			8	8	2	2				
Switch Phase												
Minimum Initial (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Minimum Split (s)	18.6	18.6			18.6	18.6	18.6	18.6				
Total Split (s)	19.0	19.0			19.0	19.0	21.0	21.0				
Total Split (%)	47.5%	47.5%			47.5%	47.5%	52.5%	52.5%				
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0				
All-Red Time (s)	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				
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None	None	C-Min	C-Min				

Intersection Summary


















Area Type: Other  
 Cycle Length: 40  
 Actuated Cycle Length: 40  
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated

Splits and Phases: 8: 2nd St NE & E Stewart St/E Main



HCM 2010 Signalized Intersection Summary  
 8: 2nd St NE & E Stewart St/E Main

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	57	373	0	0	394	252	130	774	1	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1900	1845	1900			
Adj Flow Rate, veh/h	60	393	0	0	415	265	137	815	1			
Adj No. of Lanes	1	1	0	0	1	1	0	2	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	0	3	0			
Cap, veh/h	297	640	0	0	640	538	230	1441	2			
Arrive On Green	0.34	0.34	0.00	0.00	0.34	0.34	0.46	0.46	0.46			
Sat Flow, veh/h	755	1863	0	0	1863	1567	503	3157	4			
Grp Volume(v), veh/h	60	393	0	0	415	265	496	0	457			
Grp Sat Flow(s),veh/h/ln	755	1863	0	0	1863	1567	1820	0	1844			
Q Serve(g_s), s	2.9	7.0	0.0	0.0	7.5	5.3	8.1	0.0	7.2			
Cycle Q Clear(g_c), s	10.4	7.0	0.0	0.0	7.5	5.3	8.1	0.0	7.2			
Prop In Lane	1.00		0.00	0.00		1.00	0.28		0.00			
Lane Grp Cap(c), veh/h	297	640	0	0	640	538	831	0	842			
V/C Ratio(X)	0.20	0.61	0.00	0.00	0.65	0.49	0.60	0.00	0.54			
Avail Cap(c_a), veh/h	321	699	0	0	699	588	831	0	842			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.46	0.46	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	15.5	10.9	0.0	0.0	11.1	10.4	8.1	0.0	7.9			
Incr Delay (d2), s/veh	0.2	0.6	0.0	0.0	1.9	0.7	3.2	0.0	2.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(0%),veh/ln	0.6	3.7	0.0	0.0	4.1	2.4	4.7	0.0	4.1			
LnGrp Delay(d),s/veh	15.7	11.6	0.0	0.0	13.0	11.1	11.3	0.0	10.4			
LnGrp LOS	B	B			B	B	B		B			
Approach Vol, veh/h		453			680			953				
Approach Delay, s/veh		12.1			12.2			10.8				
Approach LOS		B			B			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		22.3		17.7				17.7				
Change Period (Y+Rc), s		4.0		4.0				4.0				
Max Green Setting (Gmax), s		17.0		15.0				15.0				
Max Q Clear Time (g_c+1), s		10.1		12.4				9.5				
Green Ext Time (p_c), s		2.2		1.2				2.3				

Intersection Summary

HCM 2010 Ctrl Delay	11.6
HCM 2010 LOS	B

Notes

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



Lanes, Volumes, Timings  
 9: N Meridian & W Stewart St/E Stewart St

1/21/2016

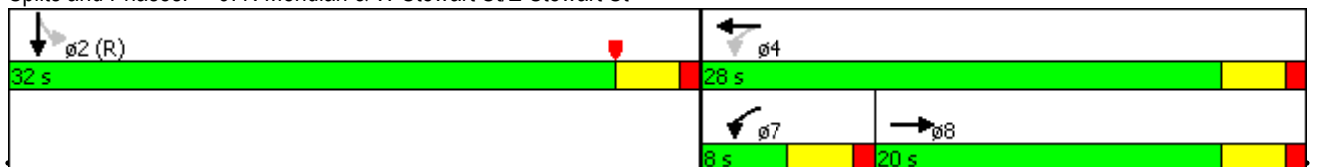


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↖						↖↗	
Volume (vph)	0	262	94	134	361	0	0	0	0	185	1097	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1361			388			473			896	
Travel Time (s)		37.1			10.6			12.9			24.4	
Confl. Peds. (#/hr)			19	19						10		18
Confl. Bikes (#/hr)			3									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 (%)	3%	3%	3%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Shared Lane Traffic (%)												
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
Turn Type		NA		pm+pt	NA					Perm		NA
Protected Phases		8		7	4							2
Permitted Phases				4						2		
Detector Phase		8		7	4					2		2
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0		4.0
Minimum Split (s)		20.0		8.0	20.0					20.0		20.0
Total Split (s)		20.0		8.0	28.0					32.0		32.0
Total Split (%)		33.3%		13.3%	46.7%					53.3%		53.3%
Yellow Time (s)		3.0		3.0	3.0					3.0		3.0
All-Red Time (s)		1.0		1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		4.0		4.0	4.0					4.0		4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Recall Mode		None		None	None					C-Min		C-Min

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:, Start of Yellow  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated


















Splits and Phases: 9: N Meridian & W Stewart St/E Stewart St



# HCM 2010 Signalized Intersection Summary

## 9: N Meridian & W Stewart St/E Stewart St

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	262	94	134	361	0	0	0	0	185	1097	80
Number	3	8	18	7	4	14				5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	1863	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	279	84	143	384	0				197	1167	82
Adj No. of Lanes	0	1	0	1	1	0				0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	3	3	2	2	0				0	2	0
Cap, veh/h	0	335	101	291	711	0				231	1435	105
Arrive On Green	0.00	0.25	0.25	0.07	0.38	0.00				0.48	0.48	0.48
Sat Flow, veh/h	0	1349	406	1774	1863	0				476	2960	217
Grp Volume(v), veh/h	0	0	363	143	384	0				761	0	685
Grp Sat Flow(s),veh/h/ln	0	0	1755	1774	1863	0				1839	0	1814
Q Serve(g_s), s	0.0	0.0	11.8	3.4	9.6	0.0				21.8	0.0	18.8
Cycle Q Clear(g_c), s	0.0	0.0	11.8	3.4	9.6	0.0				21.8	0.0	18.8
Prop In Lane	0.00		0.23	1.00		0.00				0.26		0.12
Lane Grp Cap(c), veh/h	0	0	436	291	711	0				892	0	880
V/C Ratio(X)	0.00	0.00	0.83	0.49	0.54	0.00				0.85	0.00	0.78
Avail Cap(c_a), veh/h	0	0	468	291	745	0				892	0	880
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.67	0.67	0.00				0.92	0.00	0.92
Uniform Delay (d), s/veh	0.0	0.0	21.4	15.7	14.4	0.0				13.6	0.0	12.8
Incr Delay (d2), s/veh	0.0	0.0	11.6	0.9	0.5	0.0				9.5	0.0	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.0	0.0	7.0	1.7	5.0	0.0				13.3	0.0	10.9
LnGrp Delay(d),s/veh	0.0	0.0	32.9	16.6	14.9	0.0				23.1	0.0	19.1
LnGrp LOS			C	B	B					C		B
Approach Vol, veh/h		363			527						1446	
Approach Delay, s/veh		32.9			15.4						21.2	
Approach LOS		C			B						C	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		33.1		26.9			8.0	18.9				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		28.0		24.0			4.0	16.0				
Max Q Clear Time (g_c+I1), s		23.8		11.6			5.4	13.8				
Green Ext Time (p_c), s		2.4		2.3			0.0	0.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				21.7								
HCM 2010 LOS				C								

Lanes, Volumes, Timings  
10: 5th St SW & W Pioneer

1/21/2016

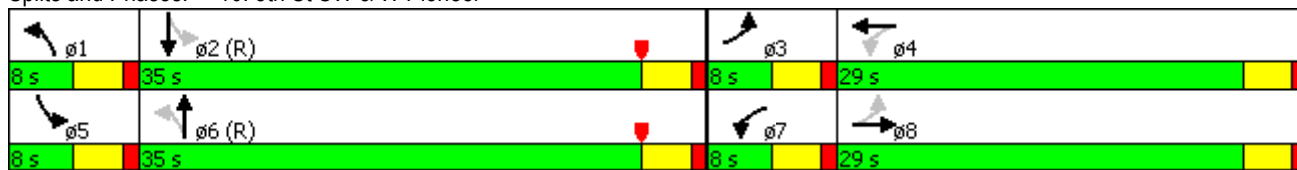


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	381	74	62	509	23	92	419	36	45	460	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	85		0	100		0	100		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		2667			1336			1545			188	
Travel Time (s)		60.6			36.4			35.1			4.3	
Confl. Peds. (#/hr)	4		6	6		4	11		7	7		11
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
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
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.0	22.0		8.0	22.0		8.0	22.0		8.0	23.0	
Total Split (s)	8.0	29.0		8.0	29.0		8.0	35.0		8.0	35.0	
Total Split (%)	10.0%	36.3%		10.0%	36.3%		10.0%	43.8%		10.0%	43.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated





















Splits and Phases: 10: 5th St SW & W Pioneer



# HCM 2010 Signalized Intersection Summary

## 10: 5th St SW & W Pioneer

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	110	381	74	62	509	23	92	419	36	45	460	156
Number	3	8	18	7	4	14	1	6	16	5	2	12
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	1.00		0.99	1.00		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1845	1845	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	115	397	77	65	530	24	96	436	38	47	479	162
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	191	491	95	234	547	25	211	684	60	328	514	174
Arrive On Green	0.05	0.32	0.32	0.04	0.31	0.31	0.05	0.41	0.41	0.03	0.39	0.39
Sat Flow, veh/h	1774	1515	294	1757	1750	79	1774	1687	147	1774	1327	449
Grp Volume(v), veh/h	115	0	474	65	0	554	96	0	474	47	0	641
Grp Sat Flow(s),veh/h/ln	1774	0	1809	1757	0	1830	1774	0	1834	1774	0	1776
Q Serve(g_s), s	3.5	0.0	19.2	2.0	0.0	23.9	2.6	0.0	16.6	1.3	0.0	27.7
Cycle Q Clear(g_c), s	3.5	0.0	19.2	2.0	0.0	23.9	2.6	0.0	16.6	1.3	0.0	27.7
Prop In Lane	1.00		0.16	1.00		0.04	1.00		0.08	1.00		0.25
Lane Grp Cap(c), veh/h	191	0	587	234	0	572	211	0	743	328	0	688
V/C Ratio(X)	0.60	0.00	0.81	0.28	0.00	0.97	0.45	0.00	0.64	0.14	0.00	0.93
Avail Cap(c_a), veh/h	191	0	587	254	0	572	211	0	743	360	0	688
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)	0.19	0.00	0.19	0.73	0.00	0.73	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	0.0	24.7	19.8	0.0	27.1	18.8	0.0	19.1	15.3	0.0	23.5
Incr Delay (d2), s/veh	1.0	0.0	1.7	0.5	0.0	24.8	1.5	0.0	4.2	0.2	0.0	21.1
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(0%),veh/ln	1.7	0.0	9.8	1.0	0.0	15.9	1.3	0.0	9.2	0.6	0.0	17.6
LnGrp Delay(d),s/veh	22.3	0.0	26.5	20.2	0.0	51.9	20.3	0.0	23.2	15.5	0.0	44.6
LnGrp LOS	C		C	C		D	C		C	B		D
Approach Vol, veh/h		589			619			570			688	
Approach Delay, s/veh		25.6			48.5			22.8			42.6	
Approach LOS		C			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	35.0	8.0	29.0	6.6	36.4	7.1	29.9				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	31.0	4.0	25.0	4.0	31.0	4.0	25.0				
Max Q Clear Time (g_c+I1), s	4.6	29.7	5.5	25.9	3.3	18.6	4.0	21.2				
Green Ext Time (p_c), s	0.0	0.7	0.0	0.0	0.0	3.7	0.0	1.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			35.5									
HCM 2010 LOS			D									

# Lanes, Volumes, Timings

## 11: S Meridian & W Pioneer/E Pioneer

1/21/2016

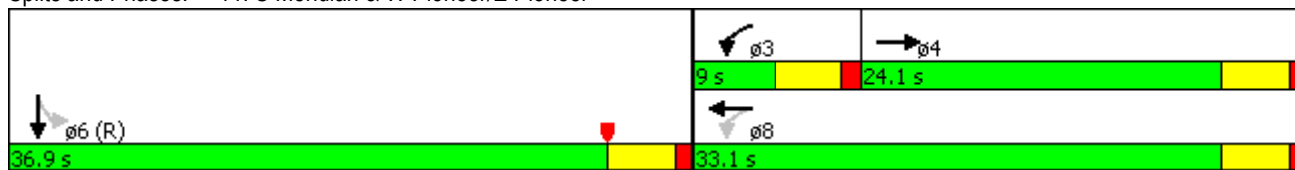


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↗						↕	↕
Volume (vph)	0	338	73	136	446	0	0	0	0	145	1029	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1336			594			1560			189	
Travel Time (s)		36.4			16.2			42.5			5.2	
Confl. Peds. (#/hr)			4	4		8				4		31
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%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Shared Lane Traffic (%)												
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
Turn Type		NA		pm+pt		NA				Perm		NA
Protected Phases		4		3		8						6
Permitted Phases				8						6		
Detector Phase		4		3		8				6		6
Switch Phase												
Minimum Initial (s)		4.0		4.0		4.0				4.0		4.0
Minimum Split (s)		23.6		9.0		23.6				23.6		23.6
Total Split (s)		24.1		9.0		33.1				36.9		36.9
Total Split (%)		34.4%		12.9%		47.3%				52.7%		52.7%
Yellow Time (s)		3.6		3.6		3.6				3.6		3.6
All-Red Time (s)		1.0		1.0		1.0				1.0		1.0
Lost Time Adjust (s)		0.0		0.0		0.0				0.0		0.0
Total Lost Time (s)		4.6		4.6		4.6				4.6		4.6
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Recall Mode		None		None		None				C-Max		C-Max

### Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Yellow  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated


















Splits and Phases: 11: S Meridian & W Pioneer/E Pioneer



# HCM 2010 Signalized Intersection Summary

## 11: S Meridian & W Pioneer/E Pioneer

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	338	73	136	446	0	0	0	0	145	1029	126
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				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
Adj Sat Flow, veh/h/ln	0	1881	1900	1900	1900	1900				1900	1881	1900
Adj Flow Rate, veh/h	0	360	68	145	474	0				154	1095	130
Adj No. of Lanes	0	1	0	1	1	0				0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	1	1	0	0	0				0	1	0
Cap, veh/h	0	406	77	254	745	0				181	1343	167
Arrive On Green	0.00	0.26	0.26	0.06	0.39	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	1538	290	1810	1900	0				392	2910	362
Grp Volume(v), veh/h	0	0	428	145	474	0				731	0	648
Grp Sat Flow(s),veh/h/ln	0	0	1828	1810	1900	0				1862	0	1803
Q Serve(g_s), s	0.0	0.0	15.8	3.9	14.1	0.0				24.4	0.0	21.2
Cycle Q Clear(g_c), s	0.0	0.0	15.8	3.9	14.1	0.0				24.4	0.0	21.2
Prop In Lane	0.00		0.16	1.00		0.00				0.21		0.20
Lane Grp Cap(c), veh/h	0	0	482	254	745	0				859	0	832
V/C Ratio(X)	0.00	0.00	0.89	0.57	0.64	0.00				0.85	0.00	0.78
Avail Cap(c_a), veh/h	0	0	509	254	774	0				859	0	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.56	0.35	0.35	0.00				0.92	0.00	0.92
Uniform Delay (d), s/veh	0.0	0.0	24.8	18.5	17.2	0.0				16.7	0.0	15.8
Incr Delay (d2), s/veh	0.0	0.0	10.3	1.1	0.6	0.0				9.7	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.0	0.0	9.3	2.0	7.5	0.0				14.7	0.0	12.0
LnGrp Delay(d),s/veh	0.0	0.0	35.1	19.5	17.8	0.0				26.4	0.0	22.4
LnGrp LOS			D	B	B					C		C
Approach Vol, veh/h		428			619						1379	
Approach Delay, s/veh		35.1			18.2						24.5	
Approach LOS		D			B						C	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.0	23.1		36.9		32.1				
Change Period (Y+Rc), s			4.6	4.6		4.6		4.6				
Max Green Setting (Gmax), s			4.4	19.5		32.3		28.5				
Max Q Clear Time (g_c+1), s			5.9	17.8		26.4		16.1				
Green Ext Time (p_c), s			0.0	0.7		3.0		2.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			24.8									
HCM 2010 LOS			C									

# Lanes, Volumes, Timings

## 12: 3rd St SE & E Pioneer

1/21/2016

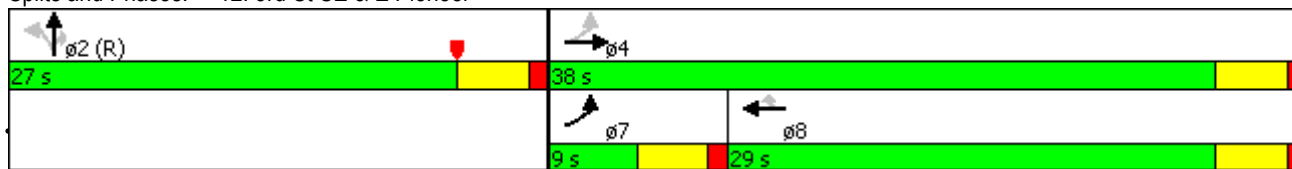


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗		↕	↗			
Volume (vph)	66	460	0	0	572	220	53	543	116	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			2%			2%			0%	
Storage Length (ft)	100		0	0		0	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		594			701			1281			183	
Travel Time (s)		16.2			19.1			34.9			5.0	
Confl. Peds. (#/hr)	5		6			5	2		6			
Confl. Bikes (#/hr)									1			
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 (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
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	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Minimum Split (s)	9.0	24.6			24.6	24.6	26.6	26.6	26.6			
Total Split (s)	9.0	38.0			29.0	29.0	27.0	27.0	27.0			
Total Split (%)	13.8%	58.5%			44.6%	44.6%	41.5%	41.5%	41.5%			
Yellow Time (s)	3.6	3.6			3.6	3.6	3.6	3.6	3.6			
All-Red Time (s)	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			
Total Lost Time (s)	4.6	4.6			4.6	4.6		4.6	4.6			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	None			None	None	C-Max	C-Max	C-Max			

### Intersection Summary



















Area Type: Other  
 Cycle Length: 65  
 Actuated Cycle Length: 65  
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Splits and Phases: 12: 3rd St SE & E Pioneer



HCM 2010 Signalized Intersection Summary  
 12: 3rd St SE & E Pioneer

1/21/2016

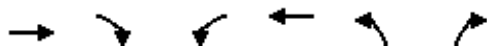
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	66	460	0	0	572	220	53	543	116	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1862	1862	0	0	1881	1881	1881	1881	1881			
Adj Flow Rate, veh/h	68	474	0	0	590	227	55	560	120			
Adj No. of Lanes	1	1	0	0	1	1	0	2	1			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	0	0	0	0	0			
Cap, veh/h	226	869	0	0	663	561	122	1308	609			
Arrive On Green	0.04	0.47	0.00	0.00	0.35	0.35	0.39	0.39	0.39			
Sat Flow, veh/h	1774	1862	0	0	1881	1592	312	3340	1553			
Grp Volume(v), veh/h	68	474	0	0	590	227	329	286	120			
Grp Sat Flow(s),veh/h/ln	1774	1862	0	0	1881	1592	1865	1787	1553			
Q Serve(g_s), s	1.5	11.8	0.0	0.0	19.2	7.0	8.5	7.5	3.3			
Cycle Q Clear(g_c), s	1.5	11.8	0.0	0.0	19.2	7.0	8.5	7.5	3.3			
Prop In Lane	1.00		0.00	0.00		1.00	0.17		1.00			
Lane Grp Cap(c), veh/h	226	869	0	0	663	561	731	700	609			
V/C Ratio(X)	0.30	0.55	0.00	0.00	0.89	0.40	0.45	0.41	0.20			
Avail Cap(c_a), veh/h	268	957	0	0	706	598	731	700	609			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.36	0.36	0.00	0.00	0.94	0.94	1.00	1.00	1.00			
Uniform Delay (d), s/veh	15.0	12.4	0.0	0.0	19.9	15.9	14.6	14.3	13.0			
Incr Delay (d2), s/veh	0.3	0.2	0.0	0.0	12.2	0.4	2.0	1.8	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(0%),veh/ln	0.7	6.1	0.0	0.0	12.1	3.1	4.7	4.0	1.5			
LnGrp Delay(d),s/veh	15.2	12.6	0.0	0.0	32.1	16.3	16.6	16.1	13.8			
LnGrp LOS	B	B			C	B	B	B	B			
Approach Vol, veh/h		542			817			735				
Approach Delay, s/veh		12.9			27.7			15.9				
Approach LOS		B			C			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		30.1		34.9			7.4	27.5				
Change Period (Y+Rc), s		4.6		4.6			4.6	4.6				
Max Green Setting (Gmax), s		22.4		33.4			4.4	24.4				
Max Q Clear Time (g_c+1), s		10.5		13.8			3.5	21.2				
Green Ext Time (p_c), s		2.2		5.0			0.0	1.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				19.8								
HCM 2010 LOS				B								



# Lanes, Volumes, Timings

## 13: SR 512 WB Ramps & E Pioneer

1/21/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Volume (vph)	627	350	454	596	153	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	236
Storage Lanes		0	1		1	1
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	30	
Link Distance (ft)	334			803	571	
Travel Time (s)	6.5			15.6	13.0	
Confl. Peds. (#/hr)		7				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
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)		9	15		15	9
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases						4
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	8.0		6.0	8.0	8.0	8.0
Minimum Split (s)	27.5		10.5	12.5	12.5	12.5
Total Split (s)	28.5		19.0	47.5	12.5	12.5
Total Split (%)	47.5%		31.7%	79.2%	20.8%	20.8%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min		None	C-Min	None	None

### Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated












Splits and Phases: 13: SR 512 WB Ramps & E Pioneer



# HCM 2010 Signalized Intersection Summary

## 13: SR 512 WB Ramps & E Pioneer

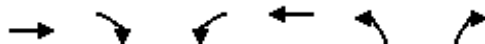
1/21/2016

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Volume (veh/h)	627	350	454	596	153	63		
Number	6	16	5	2	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1900	1881	1881	1863	1863		
Adj Flow Rate, veh/h	653	365	473	621	159	0		
Adj No. of Lanes	2	0	1	2	1	1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		
Percent Heavy Veh, %	1	1	1	1	2	2		
Cap, veh/h	903	505	433	2595	220	196		
Arrive On Green	0.41	0.41	0.24	0.73	0.12	0.00		
Sat Flow, veh/h	2300	1233	1792	3668	1774	1583		
Grp Volume(v), veh/h	529	489	473	621	159	0		
Grp Sat Flow(s),veh/h/ln	1787	1651	1792	1787	1774	1583		
Q Serve(g_s), s	14.9	14.9	14.5	3.5	5.2	0.0		
Cycle Q Clear(g_c), s	14.9	14.9	14.5	3.5	5.2	0.0		
Prop In Lane		0.75	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	732	676	433	2595	220	196		
V/C Ratio(X)	0.72	0.72	1.09	0.24	0.72	0.00		
Avail Cap(c_a), veh/h	732	676	433	2595	237	211		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.91	0.91	1.00	0.00		
Uniform Delay (d), s/veh	14.9	14.9	22.8	2.7	25.3	0.0		
Incr Delay (d2), s/veh	6.1	6.6	68.6	0.2	10.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	8.6	8.0	15.3	1.7	3.1	0.0		
LnGrp Delay(d),s/veh	21.0	21.5	91.3	2.9	35.5	0.0		
LnGrp LOS	C	C	F	A	D			
Approach Vol, veh/h	1018			1094	159			
Approach Delay, s/veh	21.2			41.1	35.5			
Approach LOS	C			D	D			
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		48.1		11.9	19.0	29.1		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		43.0		8.0	14.5	24.0		
Max Q Clear Time (g_c+1), s		5.5		7.2	16.5	16.9		
Green Ext Time (p_c), s		7.6		0.0	0.0	3.8		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			31.8					
HCM 2010 LOS			C					

# Lanes, Volumes, Timings

## 14: SR 512 EB Ramps & E Pioneer

1/21/2016

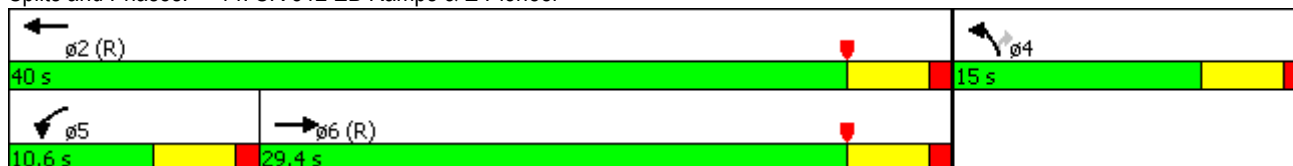


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↗
Volume (vph)	546	143	60	875	168	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	170		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	30	
Link Distance (ft)	803			1011	357	
Travel Time (s)	15.6			19.7	8.1	
Confl. Peds. (#/hr)		8				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
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)		9	15		15	9
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases						4
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	8.0		6.0	8.0	8.0	8.0
Minimum Split (s)	28.5		10.6	12.6	12.6	12.6
Total Split (s)	29.4		10.6	40.0	15.0	15.0
Total Split (%)	53.5%		19.3%	72.7%	27.3%	27.3%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Min		None	C-Min	None	None

### Intersection Summary

Area Type: Other  
 Cycle Length: 55  
 Actuated Cycle Length: 55  
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated

Splits and Phases: 14: SR 512 EB Ramps & E Pioneer



# HCM 2010 Signalized Intersection Summary

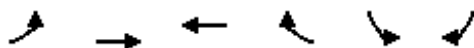
## 14: SR 512 EB Ramps & E Pioneer

1/21/2016

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑		↖	↑↑	↖	↗		
Volume (veh/h)	546	143	60	875	168	337		
Number	6	16	5	2	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1900	1881	1881	1863	1863		
Adj Flow Rate, veh/h	587	154	65	941	181	292		
Adj No. of Lanes	2	0	1	2	1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	1	1	2	2		
Cap, veh/h	1372	359	123	2307	339	302		
Arrive On Green	0.49	0.49	0.07	0.65	0.19	0.19		
Sat Flow, veh/h	2865	725	1792	3668	1774	1583		
Grp Volume(v), veh/h	374	367	65	941	181	292		
Grp Sat Flow(s),veh/h/ln	1770	1728	1792	1787	1774	1583		
Q Serve(g_s), s	7.4	7.5	1.9	7.0	5.1	10.1		
Cycle Q Clear(g_c), s	7.4	7.5	1.9	7.0	5.1	10.1		
Prop In Lane		0.42	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	876	855	123	2307	339	302		
V/C Ratio(X)	0.43	0.43	0.53	0.41	0.53	0.97		
Avail Cap(c_a), veh/h	876	855	199	2307	339	302		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.58	0.58	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	8.9	8.9	24.8	4.7	20.0	22.1		
Incr Delay (d2), s/veh	0.9	0.9	3.5	0.5	1.9	42.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	3.7	3.8	1.1	3.6	2.6	11.6		
LnGrp Delay(d),s/veh	9.8	9.8	28.2	5.2	21.9	64.6		
LnGrp LOS	A	A	C	A	C	E		
Approach Vol, veh/h	741			1006	473			
Approach Delay, s/veh	9.8			6.7	48.3			
Approach LOS	A			A	D			
<b>Timer</b>	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		40.0		15.0	8.3	31.7		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		35.5		10.5	6.1	24.9		
Max Q Clear Time (g_c+I1), s		9.0		12.1	3.9	9.5		
Green Ext Time (p_c), s		9.5		0.0	0.0	7.4		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			16.6					
HCM 2010 LOS			B					

Lanes, Volumes, Timings  
15: E Pioneer & 15th St SE

1/21/2016

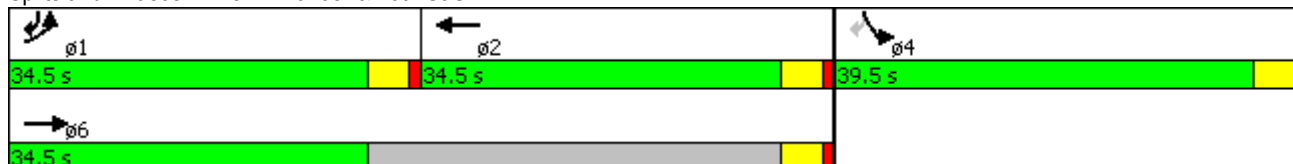


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	228	627	622	117	272	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		30	
Link Distance (ft)		838	468		1179	
Travel Time (s)		16.3	9.1		26.8	
Confl. Peds. (#/hr)					11	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		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	15	9
Turn Type	Prot	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		4	1
Permitted Phases						4
Detector Phase	1	6	2		4	1
Switch Phase						
Minimum Initial (s)	3.0	3.0	3.0		3.0	3.0
Minimum Split (s)	7.5	7.5	30.5		24.5	7.5
Total Split (s)	34.5	34.5	34.5		39.5	34.5
Total Split (%)	31.8%	31.8%	31.8%		36.4%	31.8%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?						
Recall Mode	None	Min	Min		None	None

Intersection Summary

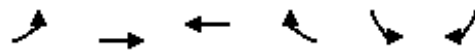
Area Type: Other  
 Cycle Length: 108.5  
 Actuated Cycle Length: 69.3  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 15: E Pioneer & 15th St SE



HCM 2010 Signalized Intersection Summary  
 15: E Pioneer & 15th St SE

1/21/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Volume (veh/h)	228	627	622	117	272	362		
Number	1	6	2	12	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1881	1900	1881	1881		
Adj Flow Rate, veh/h	233	640	635	119	278	369		
Adj No. of Lanes	1	2	2	0	1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98		
Percent Heavy Veh, %	2	2	1	1	1	1		
Cap, veh/h	303	2037	958	179	452	913		
Arrive On Green	0.17	0.58	0.32	0.32	0.25	0.25		
Sat Flow, veh/h	1774	3632	3101	563	1792	1599		
Grp Volume(v), veh/h	233	640	377	377	278	369		
Grp Sat Flow(s),veh/h/ln	1774	1770	1787	1782	1792	1599		
Q Serve(g_s), s	6.6	4.9	9.5	9.6	7.2	6.7		
Cycle Q Clear(g_c), s	6.6	4.9	9.5	9.6	7.2	6.7		
Prop In Lane	1.00			0.32	1.00	1.00		
Lane Grp Cap(c), veh/h	303	2037	569	568	452	913		
V/C Ratio(X)	0.77	0.31	0.66	0.66	0.61	0.40		
Avail Cap(c_a), veh/h	1018	2037	1025	1022	1199	1579		
HCM Platoon Ratio	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		
Uniform Delay (d), s/veh	20.7	5.8	15.4	15.4	17.3	6.3		
Incr Delay (d2), s/veh	4.1	0.1	1.3	1.3	1.9	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	3.5	2.4	4.8	4.9	3.8	5.2		
LnGrp Delay(d),s/veh	24.8	5.8	16.7	16.7	19.2	6.7		
LnGrp LOS	C	A	B	B	B	A		
Approach Vol, veh/h		873	754		647			
Approach Delay, s/veh		10.9	16.7		12.1			
Approach LOS		B	B		B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.4	21.2		17.7		34.6		
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		
Max Green Setting (Gmax), s	30.0	30.0		35.0		30.0		
Max Q Clear Time (g_c+1), s	8.6	11.6		9.2		6.9		
Green Ext Time (p_c), s	0.7	5.1		4.0		5.5		

Intersection Summary

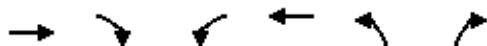
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Notes

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

Lanes, Volumes, Timings  
16: 21st St SE & E Pioneer

1/21/2016

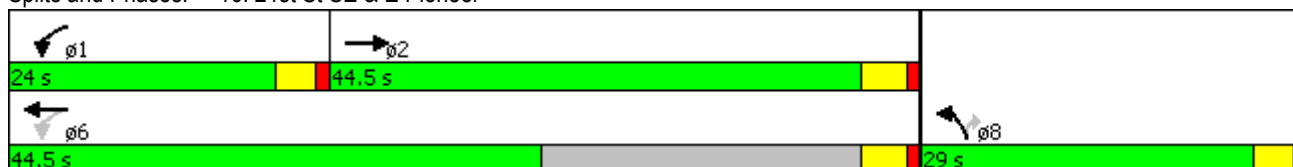


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Volume (vph)	795	63	84	739	55	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		150	0
Storage Lanes		0	0		1	1
Taper Length (ft)			50		50	
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	25	
Link Distance (ft)	1383			1343	450	
Travel Time (s)	26.9			26.2	12.3	
Confl. Peds. (#/hr)		3	3			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	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)		9	15		15	9
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	8.0		12.0	8.0	4.0	4.0
Minimum Split (s)	24.5		16.0	12.5	8.0	8.0
Total Split (s)	44.5		24.0	44.5	29.0	29.0
Total Split (%)	45.6%		24.6%	45.6%	29.7%	29.7%
Yellow Time (s)	3.5		3.0	3.5	3.0	3.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.0	4.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	Min		None	Min	None	None

Intersection Summary

Area Type: Other  
 Cycle Length: 97.5  
 Actuated Cycle Length: 39.6  
 Natural Cycle: 50  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 16: 21st St SE & E Pioneer



HCM 2010 Signalized Intersection Summary  
 16: 21st St SE & E Pioneer

1/21/2016

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑			↑↑	↖	↗		
Volume (veh/h)	795	63	84	739	55	82		
Number	2	12	1	6	3	18		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1900	1900	1881	1900	1900		
Adj Flow Rate, veh/h	828	66	88	770	57	0		
Adj No. of Lanes	2	0	0	2	1	1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		
Percent Heavy Veh, %	1	1	1	1	0	0		
Cap, veh/h	2477	197	111	1548	85	76		
Arrive On Green	0.74	0.74	0.74	0.74	0.05	0.00		
Sat Flow, veh/h	3447	267	1	2181	1810	1615		
Grp Volume(v), veh/h	441	453	408	450	57	0		
Grp Sat Flow(s),veh/h/ln	1787	1833	470	1627	1810	1615		
Q Serve(g_s), s	3.4	3.4	15.9	4.0	1.2	0.0		
Cycle Q Clear(g_c), s	3.4	3.4	15.9	4.0	1.2	0.0		
Prop In Lane		0.15	0.22		1.00	1.00		
Lane Grp Cap(c), veh/h	1320	1354	0	1202	85	76		
V/C Ratio(X)	0.33	0.33	0.00	0.37	0.67	0.00		
Avail Cap(c_a), veh/h	1802	1849	0	1641	1141	1018		
HCM Platoon Ratio	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	0.00		
Uniform Delay (d), s/veh	1.8	1.8	0.0	1.9	18.6	0.0		
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.3	8.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	1.7	1.7	0.0	1.7	0.8	0.0		
LnGrp Delay(d),s/veh	2.0	2.0	0.0	2.1	27.3	0.0		
LnGrp LOS	A	A		A	C			
Approach Vol, veh/h	894			858	57			
Approach Delay, s/veh	2.0			1.1	27.3			
Approach LOS	A			A	C			
<b>Timer</b>	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		33.8				33.8		5.9
Change Period (Y+Rc), s		4.5				4.5		4.0
Max Green Setting (Gmax), s		40.0				40.0		25.0
Max Q Clear Time (g_c+I1), s		5.4				17.9		3.2
Green Ext Time (p_c), s		14.0				11.4		0.1
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			2.4					
HCM 2010 LOS			A					



# Lanes, Volumes, Timings

## 17: Shaw Rd & E Pioneer

1/21/2016

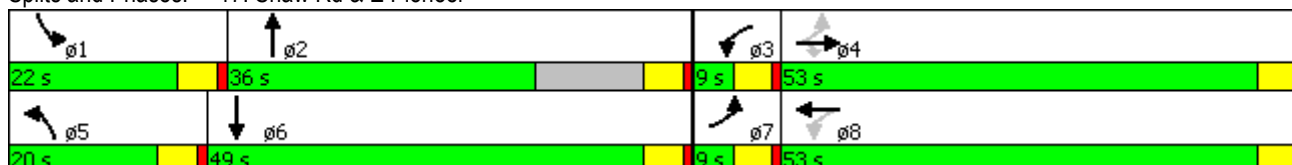


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	398	371	157	316	56	178	440	71	168	973	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	250		0	450		0
Storage Lanes	1		1	1		0	2		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1445			1301			1580			893	
Travel Time (s)		28.1			25.3			30.8			17.4	
Confl. Peds. (#/hr)												1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
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			24			24	
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
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8								
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	42.0	42.0	9.0	52.0		9.0	35.0		9.0	38.0	
Total Split (s)	9.0	53.0	53.0	9.0	53.0		20.0	36.0		22.0	49.0	
Total Split (%)	6.9%	40.5%	40.5%	6.9%	40.5%		15.3%	27.5%		16.8%	37.4%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	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)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		None	Min	

### Intersection Summary

Area Type: Other  
 Cycle Length: 131  
 Actuated Cycle Length: 110.1  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated























### Splits and Phases: 17: Shaw Rd & E Pioneer



# HCM 2010 Signalized Intersection Summary

## 17: Shaw Rd & E Pioneer

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	119	398	371	157	316	56	178	440	71	168	973	206
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	124	415	289	164	329	58	185	458	74	175	1014	215
Adj No. of Lanes	1	1	1	1	1	0	2	2	0	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	222	506	430	195	419	74	264	1116	179	210	1184	250
Arrive On Green	0.04	0.27	0.27	0.04	0.27	0.27	0.08	0.36	0.36	0.12	0.40	0.40
Sat Flow, veh/h	1774	1863	1583	1774	1543	272	3476	3085	496	1792	2937	621
Grp Volume(v), veh/h	124	415	289	164	0	387	185	264	268	175	616	613
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1815	1738	1787	1794	1792	1787	1771
Q Serve(g_s), s	4.0	20.1	15.7	4.0	0.0	19.0	5.0	10.7	10.8	9.2	30.2	30.4
Cycle Q Clear(g_c), s	4.0	20.1	15.7	4.0	0.0	19.0	5.0	10.7	10.8	9.2	30.2	30.4
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.28	1.00		0.35
Lane Grp Cap(c), veh/h	222	506	430	195	0	493	264	647	649	210	721	714
V/C Ratio(X)	0.56	0.82	0.67	0.84	0.00	0.79	0.70	0.41	0.41	0.83	0.85	0.86
Avail Cap(c_a), veh/h	222	928	789	195	0	904	541	647	649	316	817	809
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.5	32.9	31.3	34.6	0.0	32.5	43.4	23.0	23.1	41.6	26.2	26.2
Incr Delay (d2), s/veh	3.1	3.4	1.8	26.8	0.0	2.8	3.4	0.4	0.4	11.1	8.1	8.4
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(0%),veh/ln	2.5	10.8	7.1	4.5	0.0	9.8	2.5	5.3	5.4	5.2	16.5	16.5
LnGrp Delay(d),s/veh	32.7	36.2	33.1	61.4	0.0	35.3	46.8	23.4	23.5	52.6	34.2	34.6
LnGrp LOS	C	D	C	E		D	D	C	C	D	C	C
Approach Vol, veh/h		828			551			717			1404	
Approach Delay, s/veh		34.6			43.1			29.5			36.7	
Approach LOS		C			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.3	39.8	9.0	31.2	12.3	43.8	9.0	31.2				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	17.0	31.0	4.0	48.0	15.0	44.0	4.0	48.0				
Max Q Clear Time (g_c+1), s	11.2	12.8	6.0	22.1	7.0	32.4	6.0	21.0				
Green Ext Time (p_c), s	0.2	10.9	0.0	4.0	0.4	6.4	0.0	4.1				

### Intersection Summary

HCM 2010 Ctrl Delay	35.7
HCM 2010 LOS	D

### Notes

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

# Lanes, Volumes, Timings

## 18: SR-162 (Orting Hwy) & Pioneer Way E/Bowman Hilton Rd

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↖		↖	↖	
Volume (vph)	88	17	405	6	8	21	224	398	2	27	878	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	400		0	225		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			25			35			35	
Link Distance (ft)		3040			392			769			482	
Travel Time (s)		59.2			10.7			15.0			9.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	1%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
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								Yes				
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
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8						6		
Detector Phase	4	4	5	8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	10.0		10.0	10.0	
Minimum Split (s)	31.6	31.6	10.6	10.6	10.6		10.6	27.7		33.7	33.7	
Total Split (s)	34.6	34.6	29.6	34.6	34.6		29.6	65.7		65.7	65.7	
Total Split (%)	26.6%	26.6%	22.8%	26.6%	26.6%		22.8%	50.6%		50.6%	50.6%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	4.7		4.7	4.7	
All-Red Time (s)	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	
Total Lost Time (s)		4.6	4.6		4.6		4.6	5.7		5.7	5.7	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		Min	Min	

### Intersection Summary

Area Type: Other

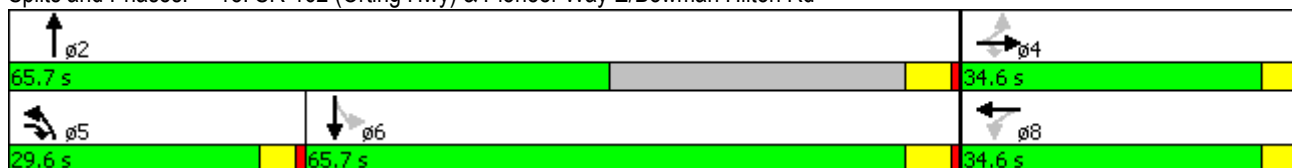
Cycle Length: 129.9

Actuated Cycle Length: 107.4

Natural Cycle: 130




















Control Type: Actuated-Uncoordinated

Splits and Phases: 18: SR-162 (Orting Hwy) & Pioneer Way E/Bowman Hilton Rd



HCM 2010 Signalized Intersection Summary  
 18: SR-162 (Orting Hwy) & Pioneer Way E/Bowman Hilton Rd

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	88	17	405	6	8	21	224	398	2	27	878	63
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1776	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	92	18	365	6	8	22	233	415	2	28	915	66
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	7	7	7	3	3	3	3	3	3
Cap, veh/h	315	57	580	68	91	193	263	1282	6	549	868	63
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.15	0.70	0.70	0.51	0.51	0.51
Sat Flow, veh/h	1214	267	1599	152	425	907	1757	1834	9	956	1700	123
Grp Volume(v), veh/h	110	0	365	36	0	0	233	0	417	28	0	981
Grp Sat Flow(s),veh/h/ln	1481	0	1599	1484	0	0	1757	0	1843	956	0	1823
Q Serve(g_s), s	4.9	0.0	22.2	0.0	0.0	0.0	15.3	0.0	10.3	1.7	0.0	60.0
Cycle Q Clear(g_c), s	7.0	0.0	22.2	2.1	0.0	0.0	15.3	0.0	10.3	1.7	0.0	60.0
Prop In Lane	0.84		1.00	0.17		0.61	1.00		0.00	1.00		0.07
Lane Grp Cap(c), veh/h	372	0	580	352	0	0	263	0	1288	549	0	931
V/C Ratio(X)	0.30	0.00	0.63	0.10	0.00	0.00	0.89	0.00	0.32	0.05	0.00	1.05
Avail Cap(c_a), veh/h	433	0	647	412	0	0	374	0	1288	549	0	931
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	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.0	0.0	30.9	37.2	0.0	0.0	49.0	0.0	6.9	14.5	0.0	28.8
Incr Delay (d2), s/veh	0.3	0.0	1.4	0.1	0.0	0.0	15.3	0.0	0.1	0.0	0.0	44.9
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(0%),veh/ln	3.1	0.0	9.9	0.9	0.0	0.0	8.6	0.0	5.3	0.5	0.0	41.6
LnGrp Delay(d),s/veh	39.3	0.0	32.3	37.3	0.0	0.0	64.3	0.0	7.0	14.6	0.0	73.6
LnGrp LOS	D		C	D			E		A	B		F
Approach Vol, veh/h		475			36			650			1009	
Approach Delay, s/veh		33.9			37.3			27.5			72.0	
Approach LOS		C			D			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		87.9		29.7	22.2	65.7		29.7				
Change Period (Y+Rc), s		5.7		4.6	4.6	5.7		4.6				
Max Green Setting (Gmax), s		60.0		30.0	25.0	60.0		30.0				
Max Q Clear Time (g_c+1), s		12.3		24.2	17.3	62.0		4.1				
Green Ext Time (p_c), s		17.8		0.9	0.3	0.0		1.6				

Intersection Summary

HCM 2010 Ctrl Delay	49.8
HCM 2010 LOS	D

Notes

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

# Lanes, Volumes, Timings

## 19: Shaw Rd & 23rd Ave SE

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	
Volume (vph)	109	59	49	33	35	20	36	479	59	19	1108	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			3%			-3%			6%	
Storage Length (ft)	100		0	100		0	200		0	250		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1320			1104			4316			2299	
Travel Time (s)		36.0			30.1			84.1			44.8	
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 (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
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	0.97	0.97	0.97	1.02	1.02	1.02	0.98	0.98	0.98	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8			1	6		5	2
Permitted Phases	4			8								
Detector Phase	4	4		8	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	22.5	22.5		21.5	21.5		8.5	18.5		8.5	18.5	
Total Split (s)	25.5	25.5		25.5	25.5		17.5	61.5		17.5	61.5	
Total Split (%)	24.4%	24.4%		24.4%	24.4%		16.7%	58.9%		16.7%	58.9%	
Yellow Time (s)	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	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag							Lead	Lead		Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	Min		None	Min	

### Intersection Summary

Area Type: Other  
 Cycle Length: 104.5  
 Actuated Cycle Length: 93.5  
 Natural Cycle: 130  
 Control Type: Actuated-Uncoordinated

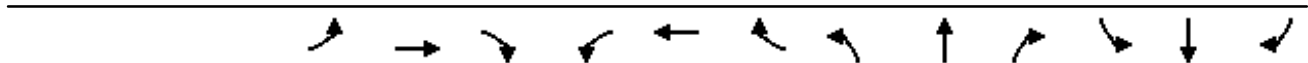
Splits and Phases: 19: Shaw Rd & 23rd Ave SE



# HCM 2010 Signalized Intersection Summary

## 19: Shaw Rd & 23rd Ave SE

1/21/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Volume (veh/h)	109	59	49	33	35	20	36	479	59	19	1108	122
Number	7	4	14	3	8	18	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1948	1909	1948	1872	1817	1872	1891	1891	1928	1825	1825	1843
Adj Flow Rate, veh/h	112	61	51	34	36	21	37	494	61	20	1142	126
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
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, %	2	2	2	3	3	3	2	2	2	1	1	1
Cap, veh/h	186	81	60	126	123	58	49	548	68	611	1060	117
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.03	0.33	0.33	0.35	0.66	0.66
Sat Flow, veh/h	766	499	373	430	764	358	1801	1651	204	1738	1615	178
Grp Volume(v), veh/h	224	0	0	91	0	0	37	0	555	20	0	1268
Grp Sat Flow(s),veh/h/ln	1638	0	0	1552	0	0	1801	0	1855	1738	0	1793
Q Serve(g_s), s	7.2	0.0	0.0	0.0	0.0	0.0	1.8	0.0	24.8	0.7	0.0	57.0
Cycle Q Clear(g_c), s	11.4	0.0	0.0	4.1	0.0	0.0	1.8	0.0	24.8	0.7	0.0	57.0
Prop In Lane	0.50		0.23	0.37		0.23	1.00		0.11	1.00		0.10
Lane Grp Cap(c), veh/h	327	0	0	307	0	0	49	0	615	611	0	1176
V/C Ratio(X)	0.69	0.00	0.00	0.30	0.00	0.00	0.76	0.00	0.90	0.03	0.00	1.08
Avail Cap(c_a), veh/h	451	0	0	428	0	0	269	0	1217	611	0	1176
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.1	0.0	0.0	32.2	0.0	0.0	42.0	0.0	27.7	18.5	0.0	14.9
Incr Delay (d2), s/veh	2.6	0.0	0.0	0.5	0.0	0.0	20.7	0.0	5.2	0.0	0.0	49.9
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(0%),veh/ln	5.5	0.0	0.0	2.0	0.0	0.0	1.2	0.0	13.5	0.3	0.0	44.1
LnGrp Delay(d),s/veh	37.6	0.0	0.0	32.8	0.0	0.0	62.7	0.0	32.9	18.5	0.0	64.9
LnGrp LOS	D			C			E		C	B		F
Approach Vol, veh/h		224			91			592			1288	
Approach Delay, s/veh		37.6			32.8			34.8			64.1	
Approach LOS		D			C			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	61.5		18.5	35.0	33.3		18.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	13.0	57.0		21.0	13.0	57.0		21.0				
Max Q Clear Time (g_c+1), s	3.8	59.0		13.4	2.7	26.8		6.1				
Green Ext Time (p_c), s	0.0	0.0		0.7	5.1	2.0		0.9				

### Intersection Summary

HCM 2010 Ctrl Delay	52.2
HCM 2010 LOS	D

### Notes

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

Lanes, Volumes, Timings  
 20: Shaw Rd E/Shaw Rd & 39th Ave SE

1/21/2016

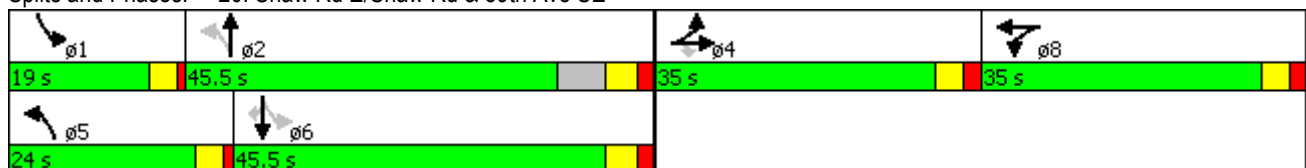


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔		↖	↗		↖	↗	↗
Volume (vph)	274	4	454	2	2	4	309	412	5	1	840	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	280		0	150		500
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2283			612			552			915	
Travel Time (s)		44.5			11.9			10.8			17.8	
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 (%)	0%	0%	0%	14%	14%	14%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)												
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
Turn Type	Split	NA	Perm	Split	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4				2			6		6
Detector Phase	4	4	4	8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0		8.0	22.5		8.0	22.5	22.5
Total Split (s)	35.0	35.0	35.0	35.0	35.0		24.0	45.5		19.0	45.5	45.5
Total Split (%)	25.1%	25.1%	25.1%	25.1%	25.1%		17.2%	32.6%		13.6%	32.6%	32.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0		4.0	5.5		4.0	5.5	5.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		None	Min	Min

Intersection Summary





















Area Type: Other  
 Cycle Length: 139.5  
 Actuated Cycle Length: 98.7  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated

Splits and Phases: 20: Shaw Rd E/Shaw Rd & 39th Ave SE



HCM 2010 Signalized Intersection Summary  
 20: Shaw Rd E/Shaw Rd & 39th Ave SE

1/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	274	4	454	2	2	4	309	412	5	1	840	252
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1667	1900	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	291	4	133	2	2	4	329	438	5	1	894	12
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	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
Percent Heavy Veh, %	0	0	0	14	14	14	1	1	1	2	2	2
Cap, veh/h	343	5	310	3	3	6	369	1095	13	483	798	678
Arrive On Green	0.19	0.19	0.19	0.01	0.01	0.01	0.16	0.59	0.59	0.00	0.43	0.43
Sat Flow, veh/h	1786	25	1615	379	379	757	1792	1856	21	1774	1863	1583
Grp Volume(v), veh/h	295	0	133	8	0	0	329	0	443	1	894	12
Grp Sat Flow(s),veh/h/ln	1811	0	1615	1514	0	0	1792	0	1877	1774	1863	1583
Q Serve(g_s), s	14.7	0.0	6.8	0.5	0.0	0.0	12.7	0.0	11.8	0.0	40.0	0.4
Cycle Q Clear(g_c), s	14.7	0.0	6.8	0.5	0.0	0.0	12.7	0.0	11.8	0.0	40.0	0.4
Prop In Lane	0.99		1.00	0.25		0.50	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	347	0	310	12	0	0	369	0	1108	483	798	678
V/C Ratio(X)	0.85	0.00	0.43	0.66	0.00	0.00	0.89	0.00	0.40	0.00	1.12	0.02
Avail Cap(c_a), veh/h	582	0	519	487	0	0	461	0	1108	766	798	678
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	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	33.2	46.2	0.0	0.0	28.1	0.0	10.3	15.2	26.7	15.4
Incr Delay (d2), s/veh	6.1	0.0	0.9	47.2	0.0	0.0	16.6	0.0	0.2	0.0	70.2	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(0%),veh/ln	7.9	0.0	3.1	0.4	0.0	0.0	9.9	0.0	6.1	0.0	36.0	0.2
LnGrp Delay(d),s/veh	42.5	0.0	34.2	93.3	0.0	0.0	44.7	0.0	10.5	15.2	96.9	15.4
LnGrp LOS	D		C	F			D		B	B	F	B
Approach Vol, veh/h		428			8			772			907	
Approach Delay, s/veh		39.9			93.3			25.1			95.7	
Approach LOS		D			F			C			F	
<b>Timer</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.1	60.6		22.9	19.2	45.5		5.7				
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0				
Max Green Setting (Gmax), s	15.0	40.0		30.0	20.0	40.0		30.0				
Max Q Clear Time (g_c+I1), s	2.0	13.8		16.7	14.7	42.0		2.5				
Green Ext Time (p_c), s	0.0	5.8		1.2	0.5	0.0		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			58.6									
HCM 2010 LOS			E									



Lanes, Volumes, Timings  
21: Shaw Rd & Site Access

1/22/2016

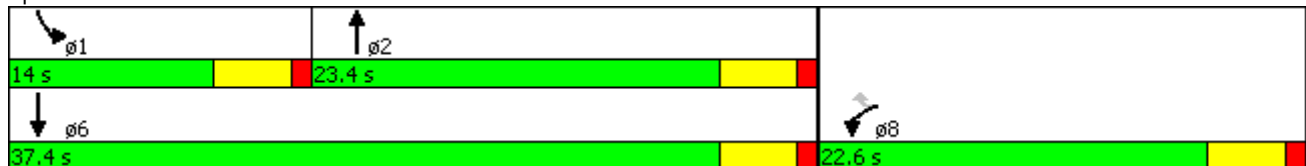


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	102	350	571	44	157	1245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500	0		0	200	
Storage Lanes	1	1		0	1	
Taper Length (ft)	50				50	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		35			35
Link Distance (ft)	1206		893			1499
Travel Time (s)	27.4		17.4			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
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	
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	22.6	22.6	22.6		8.6	22.6
Total Split (s)	22.6	22.6	23.4		14.0	37.4
Total Split (%)	37.7%	37.7%	39.0%		23.3%	62.3%
Yellow Time (s)	3.6	3.6	3.6		3.6	3.6
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6		4.6	4.6
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Recall Mode	None	None	Min		None	Min

Intersection Summary












Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	45.9
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated

Splits and Phases: 21: Shaw Rd & Site Access



HCM 2010 Signalized Intersection Summary  
 21: Shaw Rd & Site Access

1/22/2016

									
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations									
Volume (veh/h)	102	350	571	44	157	1245			
Number	3	18	2	12	1	6			
Initial Q (Qb), veh	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00				
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	113	196	634	49	174	1383			
Adj No. of Lanes	1	1	2	0	1	2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	2	2	2	2	2	2			
Cap, veh/h	310	277	1273	98	224	2174			
Arrive On Green	0.18	0.18	0.38	0.38	0.13	0.61			
Sat Flow, veh/h	1774	1583	3423	257	1774	3632			
Grp Volume(v), veh/h	113	196	337	346	174	1383			
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1817	1774	1770			
Q Serve(g_s), s	2.5	5.1	6.3	6.3	4.1	10.8			
Cycle Q Clear(g_c), s	2.5	5.1	6.3	6.3	4.1	10.8			
Prop In Lane	1.00	1.00		0.14	1.00				
Lane Grp Cap(c), veh/h	310	277	677	695	224	2174			
V/C Ratio(X)	0.36	0.71	0.50	0.50	0.78	0.64			
Avail Cap(c_a), veh/h	731	653	762	783	382	2659			
HCM Platoon Ratio	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			
Uniform Delay (d), s/veh	15.9	17.0	10.3	10.3	18.5	5.3			
Incr Delay (d2), s/veh	0.7	3.3	0.6	0.6	5.7	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(0%),veh/ln	1.3	2.4	3.2	3.3	2.4	5.3			
LnGrp Delay(d),s/veh	16.6	20.3	10.8	10.8	24.1	5.7			
LnGrp LOS	B	C	B	B	C	A			
Approach Vol, veh/h	309		683			1557			
Approach Delay, s/veh	18.9		10.8			7.8			
Approach LOS	B		B			A			
Timer	1	2	3	4	5	6	7	8	
Assigned Phs	1	2				6		8	
Phs Duration (G+Y+Rc), s	10.1	21.3				31.4		12.2	
Change Period (Y+Rc), s	4.6	4.6				4.6		4.6	
Max Green Setting (Gmax), s	9.4	18.8				32.8		18.0	
Max Q Clear Time (g_c+I1), s	6.1	8.3				12.8		7.1	
Green Ext Time (p_c), s	0.1	8.3				14.0		0.7	
<b>Intersection Summary</b>									
HCM 2010 Ctrl Delay			9.9						
HCM 2010 LOS			A						

Lanes, Volumes, Timings  
 22: 33rd St SE & 80th St E

1/21/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	138	4	50	59	7	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30		30			25
Link Distance (ft)	1192		178			687
Travel Time (s)	27.1		4.0			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
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

HCM Unsignalized Intersection Capacity Analysis  
 22: 33rd St SE & 80th St E

1/21/2016



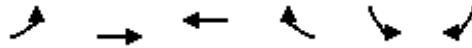
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	138	4	50	59	7	114
Sign Control	Free		Stop			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	153	4	56	66	8	127
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		311	0	402	309
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		311	0	402	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		90	94	98	77
cM capacity (veh/h)	1623		547	1085	450	548

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	158	121	134
Volume Left	153	0	8
Volume Right	4	66	0
cSH	1623	747	541
Volume to Capacity	0.09	0.16	0.25
Queue Length 95th (ft)	8	14	24
Control Delay (s)	7.3	10.7	13.8
Lane LOS	A	B	B
Approach Delay (s)	7.3	10.7	13.8
Approach LOS		B	B

Intersection Summary			
Average Delay		10.4	
Intersection Capacity Utilization		26.3%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings  
 23: E Pioneer & 33rd St SE

1/21/2016



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	↙
Volume (vph)	87	532	272	14	27	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35	35		25	
Link Distance (ft)		1301	586		178	
Travel Time (s)		25.3	11.4		4.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
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	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

**Intersection**

Int Delay, s/veh 4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	87	532	272	14	27	223
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	94	572	292	15	29	240

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	308	0	1059
Stage 1	-	-	300
Stage 2	-	-	759
Critical Hdwy	4.12	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.218	-	3.509
Pot Cap-1 Maneuver	1253	-	250
Stage 1	-	-	754
Stage 2	-	-	464
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1253	-	223
Mov Cap-2 Maneuver	-	-	223
Stage 1	-	-	754
Stage 2	-	-	413

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	16
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1253	-	-	-	593
HCM Lane V/C Ratio	0.075	-	-	-	0.453
HCM Control Delay (s)	8.1	0	-	-	16
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.4

# Appendix D

## Signal Warrant Analysis

**Knutson**  
**TENW Project #5108**

Signal Warrant Analysis for Shaw Road / Site Access  
 2018 With-Project

**Warrant 1 - Eight Hour Vehicular Volume**  
**Condition A - Minimum Vehicular Volume**

Hour Begins	Minor Approach Site Access Highest EB/WB (2)	Major Approach Shaw Road Total NB & SB (2)	MUTCD (1) Warrant 1A
6:00	86	1,303	
7:00	118	1,600	
8:00	81	1,181	
9:00	111	987	
10:00	81	920	
11:00	119	983	
12:00	86	1,088	
13:00	65	1,163	
14:00	67	1,420	
15:00	230	1,645	
16:00	295	1,795	
17:00	55	1,673	
18:00	46	1,306	
19:00	47	835	

**WARRANT MET (3) = NO**

Notes:

- (1) MUTCD - Manual on Uniform Traffic Control Devices, 2009.
- (2) Three-day average of 24-hour volumes conducted on 1/5, 1/6, and 1/7, 2016.
- (3) Signal warrant satisfied when traffic volumes exist for each of any 8 hours of an average day.

**MUTCD Warrant Requirements**

**Warrant 1, Condition A: Minimum Vehicular Volume**

Minimum volume of 600 vehicles per hour on 2-lane major street (both approaches) and 150 vehicles per hour on 1-lane minor street approach.



**Knutson**  
**TENW Project #5108**

Signal Warrant Analysis for Shaw Road / Site Access  
 2018 With-Project

**Warrant 1 - Eight Hour Vehicular Volume**  
**Condition B - Interruption of Continuous Traffic**

Hour Begins	Minor Approach Site Access Highest EB/WB (2)	Major Approach Shaw Road Total NB & SB (2)	MUTCD (1) Warrant 1B
6:00	86	1,303	YES
7:00	118	1,600	YES
8:00	81	1,181	YES
9:00	111	987	YES
10:00	81	920	YES
11:00	119	983	YES
12:00	86	1,088	YES
13:00	65	1,163	
14:00	67	1,420	
15:00	230	1,645	YES
16:00	295	1,795	YES
17:00	55	1,673	
18:00	46	1,306	
19:00	47	835	

**WARRANT MET (3) = YES**

Notes:

- (1) MUTCD - Manual on Uniform Traffic Control Devices, 2009.
- (2) Three-day average of 24-hour volumes conducted on 1/5, 1/6, and 1/7, 2016.
- (3) Signal warrant satisfied when traffic volumes exist for each of any 8 hours of an average day.

**MUTCD Warrant Requirements**

**Warrant 1, Condition B: Interruption of Continuous Traffic**

Minimum volume of 900 vehicles per hour on 2-lane major street (both approaches) and 75 vehicles per hour on 1-lane minor street approach.

**Knutson**  
**TENW Project #5108**

Signal Warrant Analysis for Shaw Road / Site Access  
 2018 With-Project

**Warrant 1 - Eight Hour Vehicular Volume  
 Combination of Condition A and Condition B**

Hour Begins	Minor Approach Site Access Highest EB/WB (2)	Major Approach Shaw Road Total NB & SB (2)	MUTCD (1)		
			Warrant 1 A/B	80% Condition A	80% Condition B
6:00	86	1,303			YES
7:00	118	1,600			YES
8:00	81	1,181			YES
9:00	111	987			YES
10:00	81	920			YES
11:00	119	983			YES
12:00	86	1,088			YES
13:00	65	1,163			YES
14:00	67	1,420			YES
15:00	230	1,645	YES	YES	YES
16:00	295	1,795	YES	YES	YES
17:00	55	1,673			
18:00	46	1,306			
19:00	47	835			

**WARRANT MET (3) = NO**

Notes:

- (1) MUTCD - Manual on Uniform Traffic Control Devices, 2009.
- (2) Three-day average of 24-hour volumes conducted on 1/5, 1/6, and 1/7, 2016.
- (3) Signal warrant satisfied when traffic volumes exist for each of any 8 hours of an average day.

**MUTCD Warrant Requirements**

**Warrant 1: Combination of A and B**

The combination of warrants is satisfied where Condition A and Condition B are satisfied to the extent of 80 percent or more of the stated values.

**NOTE:**

This combination warrant only applies after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

**Knutson**  
**TENW Project #5108**

Signal Warrant Analysis for Shaw Road / Site Access  
 2018 With-Project

**Warrant 2 - Four Hour Vehicular Volume**

Hour Begins	Minor Approach Site Access Highest EB/WB (2)	Major Approach Shaw Road Total NB & SB (2)	MUTCD (1)
			Warrant 2
6:00	86	1,303	YES
7:00	118	1,600	YES
8:00	81	1,181	
9:00	111	987	
10:00	81	920	
11:00	119	983	
12:00	86	1,088	
13:00	65	1,163	
14:00	67	1,420	
15:00	230	1,645	YES
16:00	295	1,795	YES
17:00	55	1,673	
18:00	46	1,306	
17:00	47	835	
<b>WARRANT MET (3) =</b>			<b>YES</b>

Notes:

- (1) MUTCD - Manual on Uniform Traffic Control Devices, 2009.
- (2) Three-day average of 24-hour volumes conducted on 1/5, 1/6, and 1/7, 2016.
- (3) Signal warrant satisfied when traffic volumes exist for each of any 4 hours of an average day.

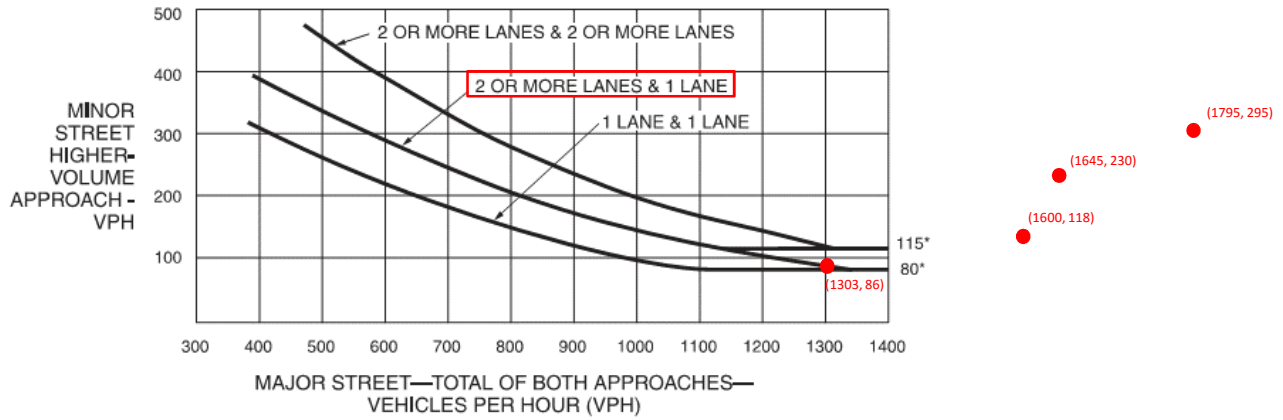
**MUTCD Warrant Requirements**

**Warrant 2: Four Hour Vehicular Volume**

The plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the applicable curve in Figure 4C-1 for the existing combination of approach lanes.

**Warrant 2 - Four Hour Vehicular Volume**

**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume**



\*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

**WARRANT MET (2) = YES**

Notes:

- (1) The four highest hourly minor/major approach volumes as shown in the data for Warrant 1.
- (2) The signal warrant is satisfied when the conditions given below exist for each of any 4 hours of an average day.

**MUTCD Warrant Requirements**

**Warrant 2: Four Hour Vehicular Volume**

The plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the applicable curve in Figure 4C-1 for the existing combination of approach lanes. On the minor street, the higher volume shall not be required to be on the same approach during each of these 4 hours.

Signal Warrant Analysis for Shaw Road / Site Access  
2018 With-Project

**Warrant 3 - Peak Hour (AM Peak Hour)**

**Condition A**

This warrant is met if all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:

1. The total stopped delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach

<b>Shaw Road / Site Access, WB approach (2 lanes)</b>			
Control Delay (sec/veh) =	22.0	sec/veh	**Based on results from HCM 2010 analysis
Stopped Delay (sec/veh) =	16.9	sec/veh	
Total Volume (veh/hr) =	102	veh/hour	
Vehicle-Hours =	0.48	veh-hours	
<b>CONDITION 1 MET =</b>	<b>NO</b>		

2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes.

<b>Shaw Road / Site Access, WB approach volume =</b>	102
<b>CONDITION 2 MET =</b>	<b>NO</b>

3. The total entering volume serviced during the hour equals or exceeds 650 vehicle per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

<b>Shaw Road / Site Access, Total approach volume =</b>	1,860
<b>CONDITION 3 MET =</b>	<b>YES</b>

<b>WARRANT MET =</b>	<b>NO</b>
----------------------	-----------

**NOTE:**

This signal warrant shall only be applied in unusual cases. Such cases include, but are not limited to, office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Signal Warrant Analysis for Shaw Road / Site Access  
2018 With-Project

**Warrant 3 - Peak Hour (PM Peak Hour)**

**Condition A**

This warrant is met if all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:

1. The total stopped delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach

<b>Shaw Road / Site Access, WB approach (2 lanes)</b>			
Control Delay (sec/veh) =	16.6	sec/veh	**Based on results from HCM 2010 analysis
Stopped Delay (sec/veh) =	12.8	sec/veh	
Total Volume (veh/hr) =	291	veh/hour	
Vehicle-Hours =	1.03	veh-hours	
<b>CONDITION 1 MET =</b>	<b>NO</b>		

2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes.

<b>Shaw Road / Site Access, WB approach volume =</b>	291
<b>CONDITION 2 MET =</b>	<b>YES</b>

3. The total entering volume serviced during the hour equals or exceeds 650 vehicle per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

<b>Shaw Road / Site Access, Total approach volume =</b>	2,078
<b>CONDITION 3 MET =</b>	<b>YES</b>

<b>WARRANT MET =</b>	<b>NO</b>
----------------------	-----------

**NOTE:**

This signal warrant shall only be applied in unusual cases. Such cases include, but are not limited to, office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

**Knutson**  
**TENW Project #5108**

Signal Warrant Analysis for Shaw Road / Site Access  
 2018 With-Project

**Warrant 3 - Peak Hour**  
**Condition B**

Hour Begins	Minor Approach Site Access Highest EB/WB (2)	Major Approach Shaw Road Total NB & SB (2)	MUTCD (1)
			Warrant 3
6:00	86	1,303	YES
7:00	118	1,600	
8:00	81	1,181	
9:00	111	987	
10:00	81	920	
11:00	119	983	
12:00	86	1,088	
13:00	65	1,163	
14:00	67	1,420	
15:00	230	1,645	
16:00	295	1,795	
17:00	55	1,673	
18:00	46	1,306	
19:00	47	835	

**WARRANT MET (3) = YES**

Notes:

- (1) MUTCD - Manual on Uniform Traffic Control Devices, 2009.
- (2) Three-day average of 24-hour volumes conducted on 1/5, 1/6, and 1/7, 2016.
- (3) Signal warrant satisfied when traffic volumes exist for one hour of an average day.

**MUTCD Warrant Requirements**

**Warrant 3: Peak Hour - Condition B**

The plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4C-3 for the existing combination of approach lanes.

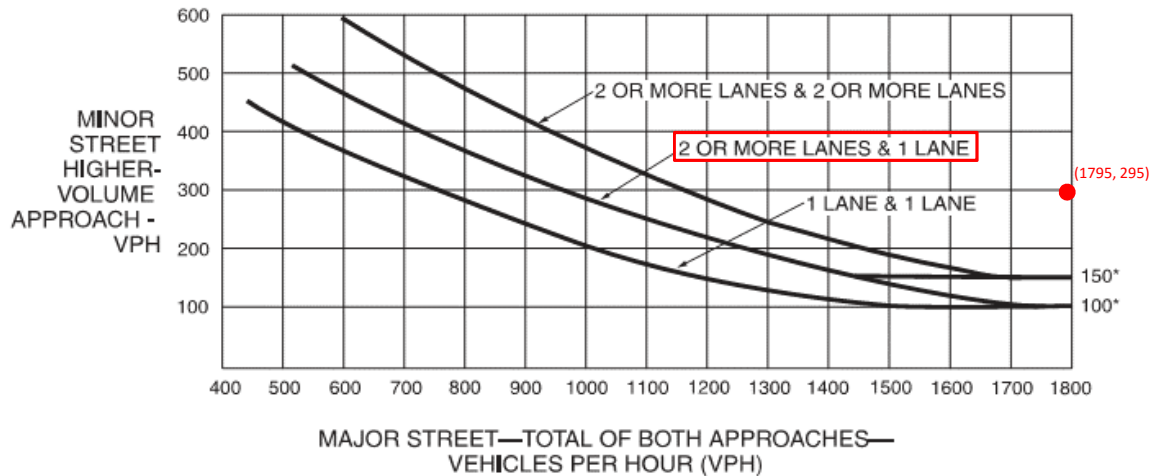
**NOTE:**

This signal warrant shall only be applied in unusual cases. Such cases include, but are not limited to, office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Signal Warrant Analysis for Shaw Road / Site Access  
2018 With-Project

**Warrant 3 - Peak Hour  
Condition B**

**Figure 4C-3. Warrant 3, Peak Hour**



\*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

**WARRANT MET (2) = YES**

Notes:

- (1) The highest hourly minor/major approach volumes as shown in the data for Warrant 1.
- (2) The signal warrant is satisfied when the conditions given below exist for one hour of an average day.

**MUTCD Warrant Requirements**

**Warrant 3: Peak Hour - Condition B**

The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor street approach (one direction only) for 1 hour of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

**NOTE:**

This signal warrant shall only be applied in unusual cases. Such cases include, but are not limited to, office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.



# Appendix E

Left-Turn Lane Analyses on 134<sup>th</sup> Avenue E

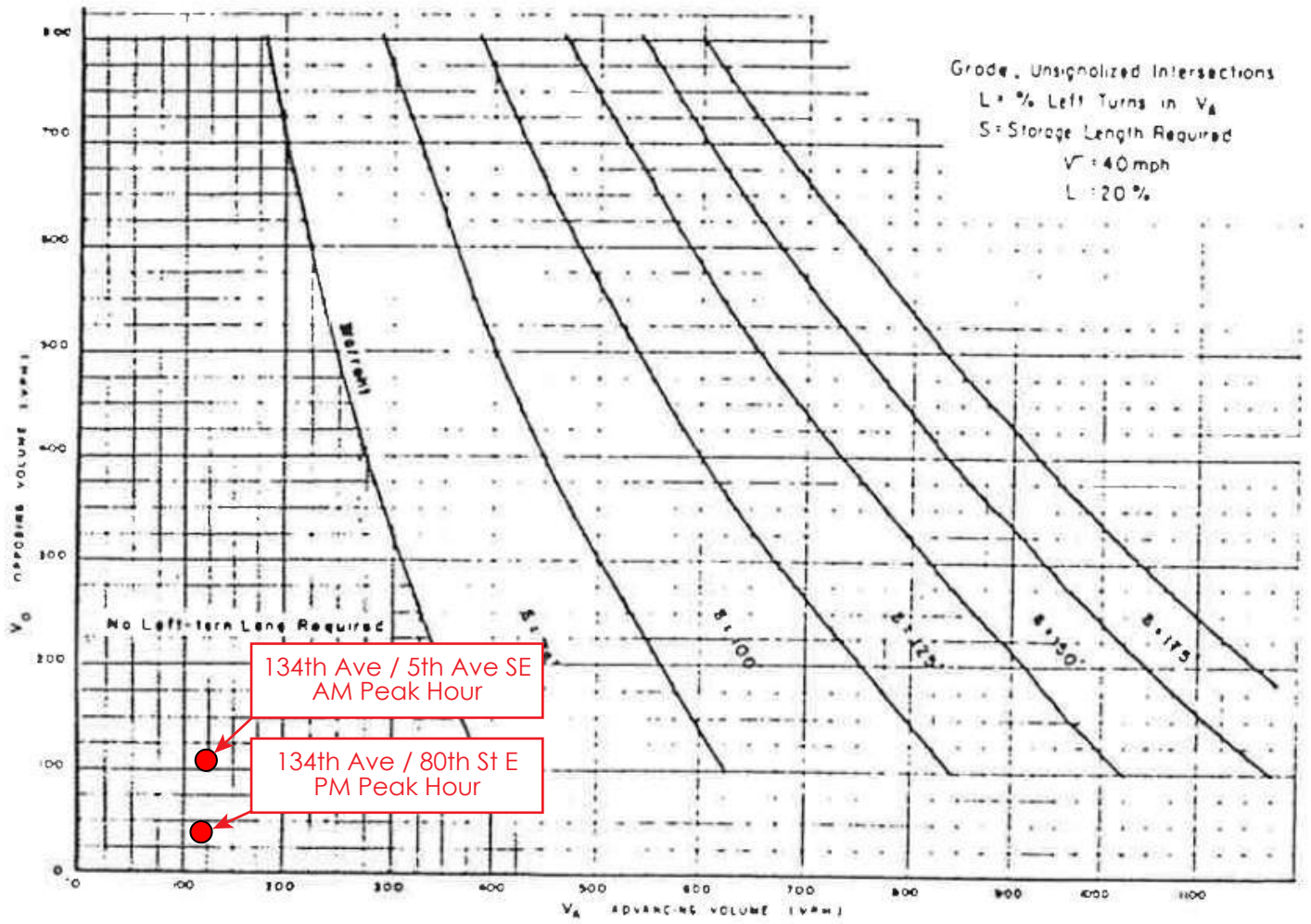


Figure 5. Warrant for left-turn storage lanes on two-lane highways.

Figure E1: Left-Turn Storage Guidelines - 40 mph, L = 20%

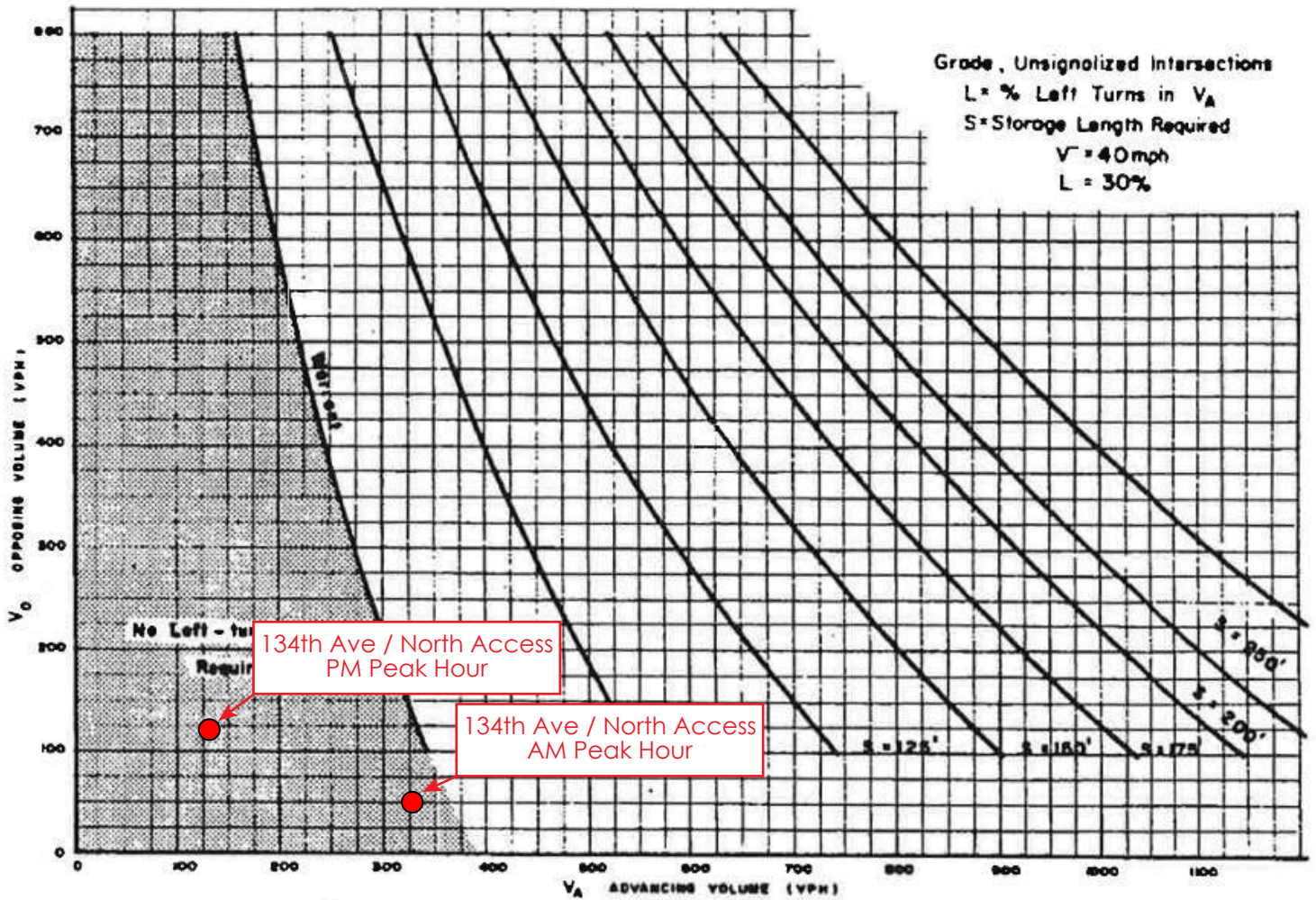


Figure 6. Warrant for left-turn storage lanes on two-lane highways.

Figure E2: Left-Turn Storage Guidelines - 40 mph, L = 30%



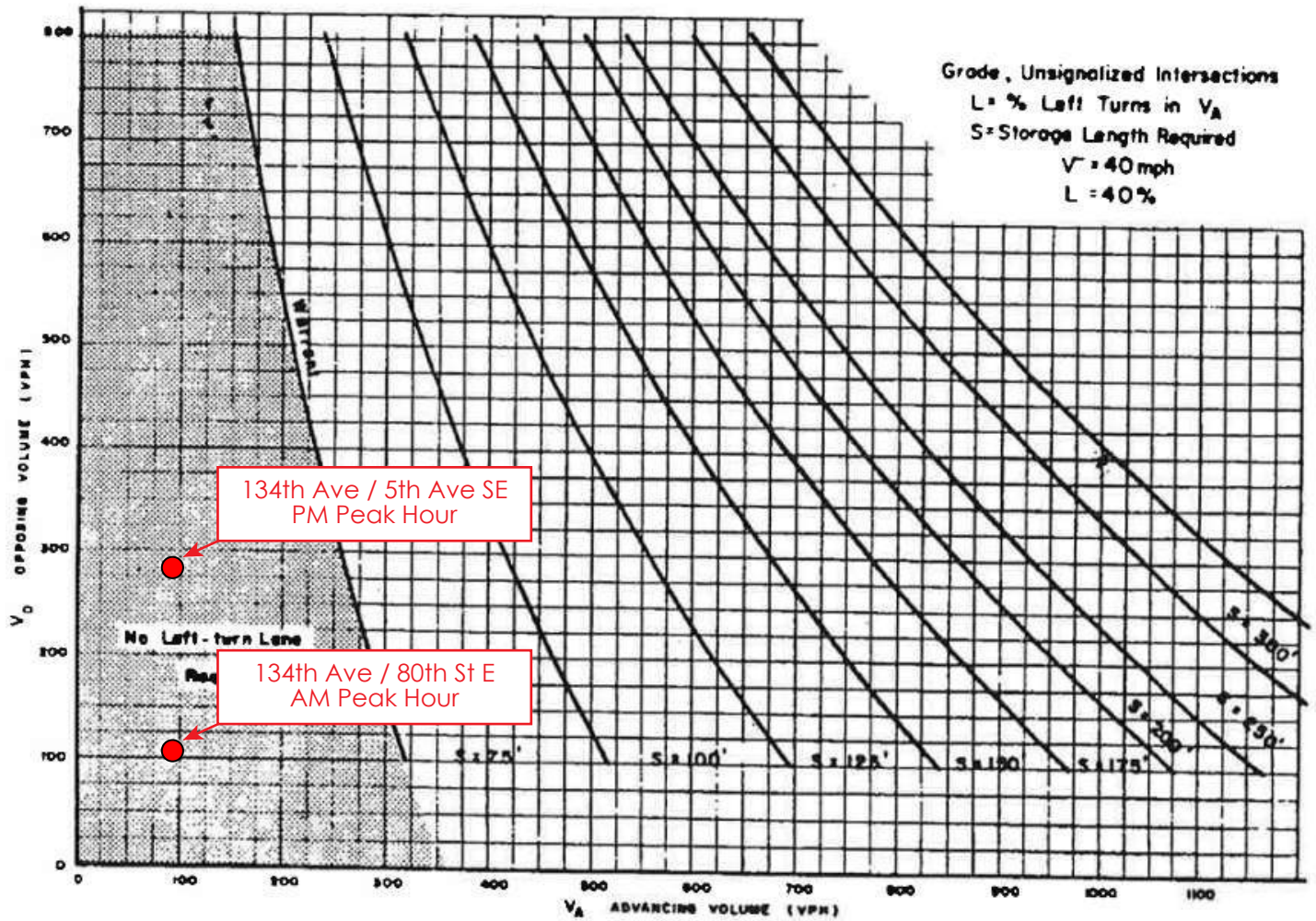


Figure 7. Warrant for left-turn storage lanes on two-lane highways.

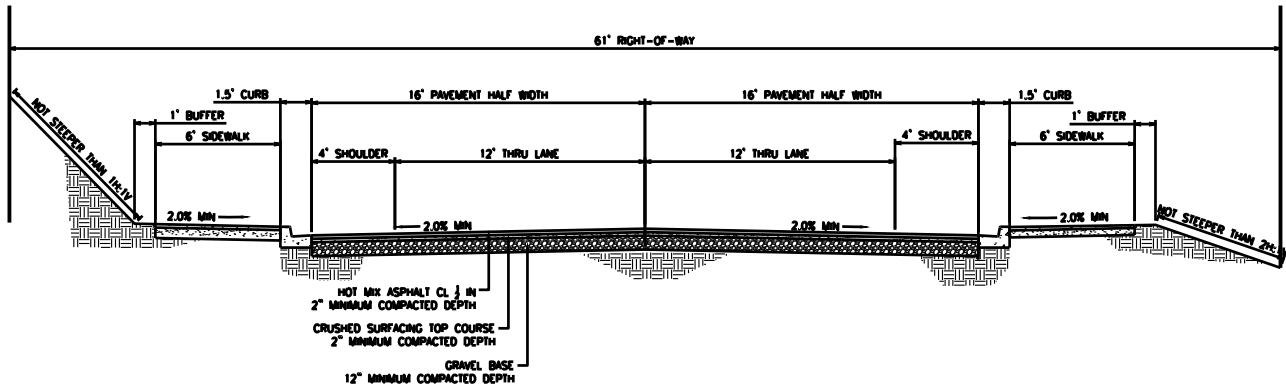
Figure E3: Left-Turn Storage Guidelines - 40 mph, L = 40%

# Appendix F

## Roadway Cross Sections

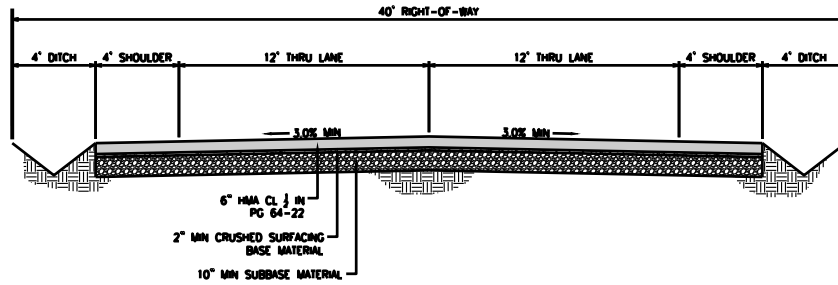
# PRELIMINARY STREET SECTION DETAILS

FOR  
**KNUTSON FARMS INDUSTRIAL PARK**  
 A PORTION OF SECTION 25, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.,  
 PIERCE COUNTY, WASHINGTON



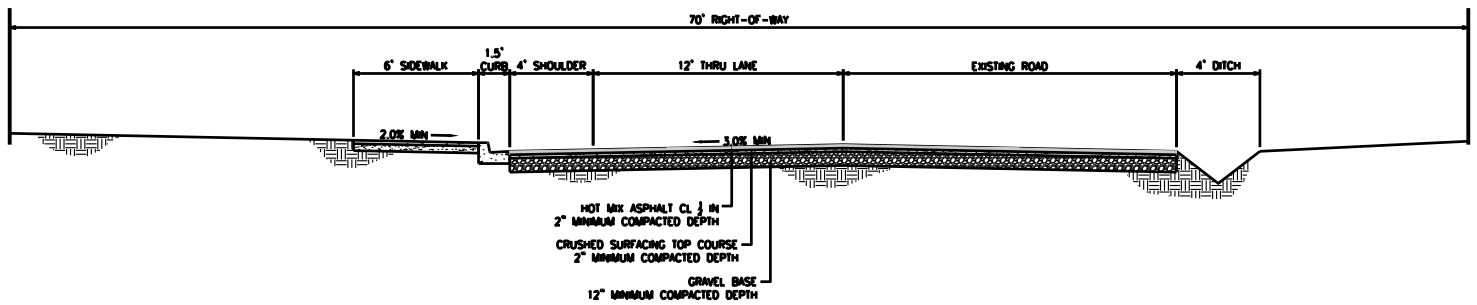
**134TH AVENUE NORTH OF 74TH AVENUE E  
 TYPICAL SECTION**

NOT TO SCALE



**134TH AVENUE SOUTH OF 74TH AVENUE E  
 TYPICAL SECTION**

NOT TO SCALE



**80TH STREET E TYPICAL SECTION**

NOT TO SCALE