



MEMORANDUM

TO: Ballpark Commons Development Team

FROM: Andre Ost, P.E., PTOE

DATE: October 7, 2016

SUBJECT: Ballpark Commons Development Traffic on Existing Transportation System
Franklin, Wisconsin

Introduction

The City of Franklin is studying the construction of the Ballpark Commons development. GRAEF was retained to evaluate the traffic impacts of the Ballpark Commons development on the existing transportation system. This report documents the procedures, findings and recommendations of the traffic study.

Study Area

The study area for the Ballpark Commons development is the same as the *Franklin Area A TIA* study which includes the following intersections:

- STH 36 (W. Loomis Road) & W. Drexel Avenue
- W. Rawson Avenue (CTH BB) & W. Crystal Ridge Drive
- W. Rawson Avenue (CTH BB) & STH 36 (W. Loomis Road) Westbound ramps
- W. Rawson Avenue (CTH BB) & STH 36 (W. Loomis Road) Eastbound ramps
- W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U)
- W. Rawson Avenue (CTH BB) & S. 68th Street
- S. 76th Street (CTH U) & W. Crystal Ridge Drive (CTH K)
- S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Westbound ramps
- S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Eastbound ramps

Conceptual site plans for the Ballpark Commons Development are shown on Exhibits 1 and 2. The existing transportation system is shown on Exhibit 3. The study area roadways are described below:

STH 36 (W. Loomis Road) is a four-lane northeast/southwest divided principal arterial that passes under S. 76th Street and W. Rawson Avenue with ramp connections to both roadways. According to the Wisconsin Department of Transportation (WisDOT), the Year 2014 Annual Average Daily Traffic (AADT) along STH 36 ranged from 16,700 vehicles per day (vpd) north of W. Drexel Avenue to 18,600 vpd north of S. 76th Street. STH 36 has a 45 mph speed limit from the south study limits to 0.3 miles north of W. Drexel Avenue where the speed limit increases to 55 mph. The 55 mph speed limit continues for 1.9 miles through the W. Rawson Avenue and S. 76th Street ramps and then decreases to 45 mph near S. 68th Street.

W. Rawson Avenue (CTH BB) is an east/west principal arterial that transitions from a two-lane undivided roadway section to a four-lane divided roadway section west of Crystal Ridge Drive. The median width through the study area is at least 25 feet wide allowing for two-stage crossing movements (vehicles can wait in the median before completing their maneuver) at stop controlled intersections. W. Rawson Avenue has a 40 mph speed limit within the study area. According to the WisDOT, the Year 2014 AADTs along W. Rawson Avenue ranged from 23,900 vpd east of S. 76th Street to 9,700 vpd west of Crystal Ridge Drive.

S. 76th Street (CTH U) is a six-lane divided north/south principal arterial with a posted speed limit of 40 mph through the study area. According to WisDOT, the most recent AADTs along S. 76th Street were 18,100 vpd north of Crystal Ridge Drive (Year 2014), 24,700 vpd north of W. Rawson Avenue (Year 2011) and 12,400 vpd north of W. Drexel Avenue (Year 2011).

S. 68th Street is a two-lane undivided north/south collector roadway with a posted speed limit of 30 mph through the study area. According to WisDOT, the Year 2011 AADT on S. 68th Street was 2,300 vpd north of W. Rawson Avenue and 2,600 vpd south of W. Rawson Avenue.

W. Drexel Avenue is a two-lane undivided east/west minor arterial roadway with a posted speed limit of 35 mph through the study area. The Year 2014 WisDOT AADT on W. Drexel Avenue ranged from 13,700 vpd west of STH 36 to 4,100 vpd east of STH 36.

Crystal Ridge Drive / Old Loomis Road (CTH K) is a two-lane northeast/southwest undivided local roadway that provides access through the Rock Sports Complex. The posted speed limit on Crystal Ridge Drive / Old Loomis Road is posted at 35 mph.

Existing Traffic

GRAEF utilized the traffic counts collected in March and April of 2015 as a part of the *Franklin Area A TIA* for this project. Based on the traffic counts, the weekday evening peak traffic hour was identified to be 4:30 to 5:30 pm and the Saturday midday peak traffic hour was identified to be 11:30 am to 12:30 pm. These peak hours are expected to coincide with the peak hours of the proposed development.

Year 2032 Background Traffic Volumes

This study analyzed the horizon Year 2032, assuming that the development would begin construction in 2017 and have full buildout by 2027. Year 2032 is the same horizon year used in the *Franklin Area A TIA*.

The WisDOT developed background traffic forecasts for the Year 2032. Annual growth rates of approximately 1% were applied to the existing traffic volumes to account for background traffic growth. The STH 36 WB off ramp on Rawson is expected to be removed with the construction of the Ballpark Commons development, therefore volumes were redistributed to account for the removal of the ramp. The Redistributed Year 2032 Background Traffic Volumes is shown on Exhibit 4.

Trip Generation

To address any potential future traffic impacts within the study area, it is necessary to identify the hourly volume of traffic generated by the proposed development. The expected traffic volumes generated by the development are based on the size and type of proposed land uses, and on trip data published in the Institute of Transportation Engineer's (ITE's) *Trip Generation, 9th Edition (2012)*. Based on information provided by the development team, the expected trip generation for the full build out of the Ballpark Commons development is shown on Exhibit 5.

The proposed development is expected to generate 1,310 total vehicle trips (810 entering vehicles/500 exiting vehicles) during the weekday evening peak hour. Of the 1,310 total vehicle trips, 265 trips are expected to be linked trips and 40 trips are expected to be pass-by trips resulting in 1,005 new development generated trips.

During the Saturday midday peak hour, the proposed development is expected to generate 1,220 total vehicle trips (635 entering vehicles/585 exiting vehicles). Of the 1,220 total vehicle trips, 245 trips are expected to be linked trips and 50 trips are expected to be pass-by trips resulting in 925 new development generated trips.

Trip Distribution/Assignment

The trip distribution for the Ballpark Commons development was developed by evaluating the existing roadway network, the existing daily traffic volumes and anticipated market area for this type of development. Exhibit 6 illustrates the following expected trip distribution for the proposed development.

- 25% to/from the northeast on STH 36
- 20% to/from the north on S. 76th Street
- 20% to/from the east on W. Rawson Avenue
- 5% to/from the southwest on STH 36
- 15% to/from the south on S. 76th Street
- 15% to/from the west on W. Rawson Avenue

Traffic generated by the proposed development was assigned to the adjacent roadway system based on the directional distributions shown above and in Exhibit 6. The Full Build Total New Trips, Pass-By Trips, and Driveway Trips are shown on Exhibits 7, 8, and 9, respectively. The Year 2032 Total Traffic Volumes are shown on Exhibit 10 and was developed by adding the Year 2032 Redistributed Background Traffic Volumes (Exhibit 4) to the Full Build Total Driveway Trips (Exhibit 9).

Traffic Operational Analysis

Level of Service Definition

The study area intersection was analyzed using Synchro Version 8. Level of Service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS 'A', to very poor, represented by LOS 'F'. For analysis and design purposes, Level of Service (LOS) 'D' was used to define acceptable peak hour operating conditions. Descriptions of the various levels of service are presented below and summarized in Table 1:

LOS A is the highest level of service that can be achieved. Under this condition, intersection approaches appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation. At signalized intersections, average delays are less than 10 seconds. At stop controlled intersections, average delays are less than 10 seconds.

LOS B represents stable operation. At signalized intersections, average vehicle delays are 10 to 20 seconds. At stop controlled intersections, average delays are 10 to 15 seconds.

LOS C still represents stable operation, but periodic backups of a few vehicles may develop behind turning vehicles. Most drivers begin to feel restricted, but not objectionably so. At signalized intersections, average vehicle delays are 20 to 35 seconds. At stop controlled intersections, average delays are 15 to 25 seconds.

LOS D represents increasing traffic restrictions as the intersection approaches instability. Delays to approaching vehicles may be substantial during short peaks within the peak period, but periodic clearance of long lines occurs, thus preventing excessive backups. At signalized intersections, average vehicle delays are 35 to 55 seconds. At stop controlled intersections, average delays are 25 to 35 seconds.

LOS E represents the capacity of the intersection. At signalized intersections, average vehicle delays are 55 to 80 seconds. At stop controlled intersections, average delays are 35 to 50 seconds.

LOS F represents jammed conditions where the intersection is over capacity and acceptable gaps for stop controlled intersections in the mainline traffic flow are minimal. At signalized intersections, average vehicle delays exceed 80 seconds. At stop controlled intersections, average delays exceed 50 seconds.

Table 1
Intersection Level of Service (LOS) Designations

Level of Service (LOS)	Stop Controlled	Signalized Intersections
	Average Delay per Vehicle (sec/veh)	Average Delay per Vehicle (sec/veh)
A	0 – 10	0 – 10
B	>10 – 15	>10 – 20
C	>15 – 25	>20 – 35
D	>25 – 35	>35 – 55
E	>35 – 50	>55 – 80
F	>50	>80

Year 2032 Total Traffic Analysis with Existing Traffic Control

The Year 2032 Total Traffic peak hour total traffic volumes are shown on Exhibit 10. The existing intersection geometrics are shown on Exhibit 3. Exhibit 11 shows the Year 2032 Total Traffic peak hour operating conditions under the existing geometrics and traffic control. As shown on Exhibit 11, the following movements are expected to operate unacceptably under the Year 2032 total traffic volumes during weekday evening and Saturday midday peak periods except the following:

W. Rawson Avenue (CTH BB) & W. Crystal Ridge Drive

- The southbound movement at intersection is expected to operate at LOS F during the weekday evening and Saturday midday peak hour.

W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U)

- The eastbound left-turn movement, southbound left-turn movement, and the southbound shared through/right-turn movement at the intersection are expected to operate at LOS F during the weekday evening peak hour.

W. Rawson Avenue (CTH BB) & S. 68th Street

- The northbound shared through/left-turn movement at the intersection is expected to operate at LOS F during the weekday evening and Saturday midday peak hour.

W. Rawson Avenue (CTH BB) & S. 68th Street

- The southbound shared through/left-turn movement at the intersection is expected to operate at LOS E during the weekday evening peak hour.

S. 76th Street (CTH U) & W. Crystal Ridge Drive

- The eastbound and westbound movements at the intersection are expected to operate at LOS F during the weekday evening and Saturday midday peak hour.

S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Eastbound ramps

- The eastbound shared through/left-turn movement at the intersection are expected to operate at LOS F during the weekday evening and Saturday midday peak hour.

The Year 2032 Total Traffic Analysis with Existing Traffic Control is included in Appendix 1.

Year 2032 Total Traffic Analysis with Traffic Signal Control

With the Ballpark Commons development traffic, traffic signal warrants are expected to be met at the following intersections:

- W. Rawson Avenue (CTH BB) & W. Crystal Ridge Drive
- S. 76th Street (CTH U) & W. Crystal Ridge Drive (CTH K)
- S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Eastbound ramps

The Year 2032 Total Traffic volumes were also analyzed using a traffic signal control at the three intersections where signals warrants are expected to be met. Exhibit 12 shows the Year 2032 Total Traffic peak hour operating conditions under the traffic signal control alternative. As shown on Exhibit 12, all movements are expected to operate at LOS D or better at the study area intersections under the Year 2032 Total Traffic volumes during the weekday evening and Saturday midday peak periods except the following:

W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U)

- The eastbound left-turn movement, westbound through movement, southbound left-turn movement, and the southbound shared through/right-turn movement at the intersection are expected to operate at LOS F during the weekday evening peak hour.

The Year 2032 Total Traffic Analysis with Traffic Signal Control is included in Appendix 2.

Queueing

To estimate storage length requirements for turn bays at the study area intersections, a queueing analysis has been conducted. The 95th percentile queues were evaluated using Synchro for each of the following analysis scenarios:

- Year 2032 Total Traffic with Existing Traffic Control – Maximum Queues (Exhibit 13)
- Year 2032 Total Traffic with Traffic Signal Control – Maximum Queues (Exhibit 14)

Year 2032 Total Traffic Queueing with Existing Traffic Control

Specific movements at the following study area intersections experience inadequate turn lane storage.

W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U) Intersection:

- Eastbound left-turn movement (385' queue > 75' storage)
- Westbound left-turn movement (55' queue > 50' storage)
- Northbound left-turn movement (165' queue > 150' storage)
- Southbound left-turn movement (415' queue > 100' storage)

Year 2032 Total Traffic Queueing with Traffic Signal Control

Specific movements at the following study area intersections experience inadequate turn lane storage.

W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U) Intersection:

- Eastbound left-turn movement (370' queue > 75' storage)
- Westbound right-turn movement (180' queue > 125' storage)
- Westbound left-turn movement (95' queue > 50' storage)
- Northbound left-turn movement (155' queue > 150' storage)
- Southbound left-turn movement (380' queue > 100' storage)

S. 76th Street (CTH U) & W. Crystal Ridge Drive (CTH K) Intersection:

- Northbound left-turn movement (315' queue > 125' storage)

Access Spacing from Ramp Terminals

The intersections of S. 76th Street (CTH U) & W. Crystal Ridge Drive (CTH K) and W. Rawson Avenue (CTH BB) & W. Crystal Ridge Drive are a concern because of their close proximity to the STH 36 ramps.

Based on the WisDOT FDM 11-5-5.3 Attachment 5.2 the spacing between ramp terminal intersection and a public roadway should be a 1,320 feet desirable (1,200 feet minimum). In order to justify a distance less than desirable WisDOT requires detailed traffic analysis to ensure that intersections will operate acceptable. It is expected that the minimum acceptable intersection spacing would be ensuring that the intersections functional areas do not overlap. WisDOT defines the functional area of an intersection as "the critical area where motorists are responding to the intersection, decelerating, and maneuvering into the appropriate lane to stop or complete a turn". The analysis completed as a part of a Traffic Impact Analysis (TIA) will be able to determine the functional area and minimum access spacing necessary to signalize the intersections of S. 76th Street (CTH U) & W. Crystal Ridge Drive (CTH K) and W. Rawson Avenue (CTH BB) & W. Crystal Ridge Drive.

Conclusions and Recommendations

The Ballpark Commons Development is expected to generate 1,310 total vehicle trips (810 entering vehicles/500 exiting vehicles) during the weekday evening peak hour and 1,220 total vehicle trips (635 entering vehicles/585 exiting vehicles) during the Saturday midday peak hour. If the Ballpark Development was to be constructed on the existing roadways, with no change in intersection control, the following movements are expected to operate unacceptably with Year 2032 traffic volumes:

W. Rawson Avenue (CTH BB) & W. Crystal Ridge Drive

- The southbound movement at intersection is expected to operate at LOS F during the weekday evening and Saturday midday peak hour.

W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U)

- The eastbound left-turn movement, southbound left-turn movement, and the southbound shared through/right-turn movement at the intersection are expected to operate at LOS F during the weekday evening peak hour.

W. Rawson Avenue (CTH BB) & S. 68th Street

- The northbound shared through/left-turn movement at the intersection is expected to operate at LOS F during the weekday evening and Saturday midday peak hour.

W. Rawson Avenue (CTH BB) & S. 68th Street

- The southbound shared through/left-turn movement at the intersection is expected to operate at LOS E during the weekday evening peak hour.

S. 76th Street (CTH U) & W. Crystal Ridge Drive

- The eastbound and westbound movements at the intersection are expected to operate at LOS F during the weekday evening and Saturday midday peak hour.

S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Eastbound ramps

- The eastbound shared through/left-turn movement at the intersection are expected to operate at LOS F during the weekday evening and Saturday midday peak hour.

With the Ballpark Commons development traffic, traffic signal warrants are expected to be met at the following intersections:

- W. Rawson Avenue (CTH BB) & W. Crystal Ridge Drive
- S. 76th Street (CTH U) & W. Crystal Ridge Drive (CTH K)
- S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Eastbound ramps

The Year 2032 Total Traffic volumes were also analyzed using a traffic signal control at the three intersections where signals warrants are expected to be met. With the traffic signal control alternative, all movements are expected to operate acceptably during the peak hours except the following:

W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U)

- The eastbound left-turn movement, westbound through movement, southbound left-turn movement, and the southbound shared through/right-turn movement at the intersection are expected to operate at LOS F during the weekday evening peak hour.

It will be necessary to provide additional capacity at the intersection of W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U) in order to make the) in order to improve operations at the intersection. Capacity improvements are likely to include providing dual-left turn lanes for the eastbound and southbound approaches along with extending turn lanes.

Once the Ballpark Commons site plan and access locations are established it is recommended to complete a detailed Traffic Impact Analysis (TIA). A TIA will be required to be completed in accordance with WisDOT standards if any STH 36 ramps are proposed to be removed or altered. A TIA study will determine what improvements are necessary to mitigate unacceptable delays or traffic queues created by the proposed development at the study intersections.

Exhibits

Exhibit 1	Conceptual Site Plan
Exhibit 2	Conceptual Site Plan - Alternative
Exhibit 3	Existing Transportation System
Exhibit 4	Redistributed Year 2032 Background Peak Hour Traffic Volumes
Exhibit 5	Trip Generation Table
Exhibit 6	Trip Distribution
Exhibit 7	Full Build Total New Trips
Exhibit 8	Full Build Total Pass-By Trips
Exhibit 9	Full Build Total Driveway Trips
Exhibit 10	Year 2032 Total Traffic Volumes
Exhibit 11	Year 2032 Total Traffic Operations with Existing Traffic Control
Exhibit 12	Year 2032 Total Traffic Operations with Traffic Signal Control
Exhibit 13	Year 2032 Total Traffic With Existing Traffic Control – Maximum Queues
Exhibit 14	Year 2032 Total Traffic With Traffic Signal Control – Maximum Queues

Appendix

Appendix 1	Design Year (Year 2032) Traffic Operational Analysis with Existing Traffic Control
Appendix 2	Design Year (Year 2032) Traffic Operational Analysis with Traffic Signal Control

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BALLPARK COMMONS

DEVELOPMENT CONCEPT ALTERNATIVE

FRANKLIN, WISCONSIN

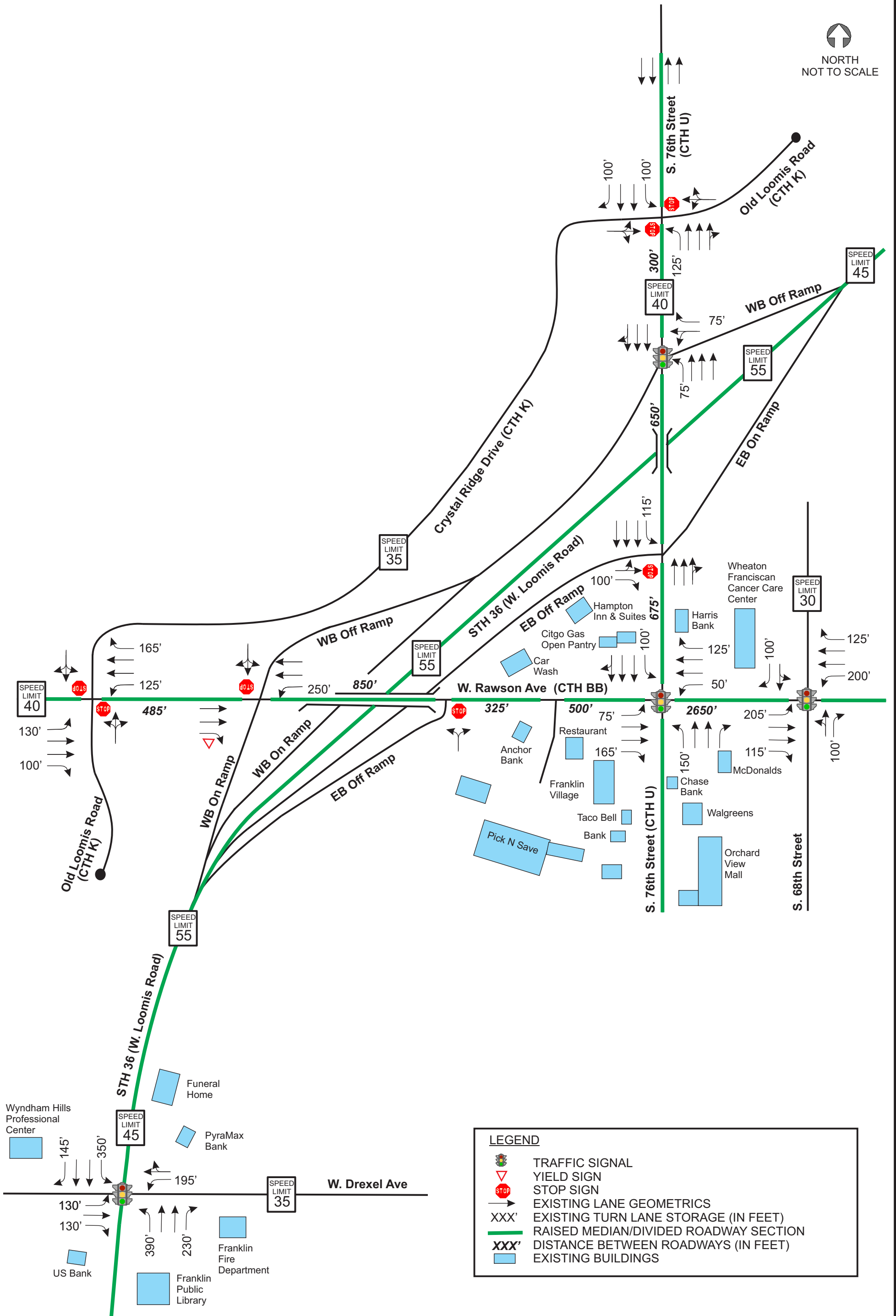
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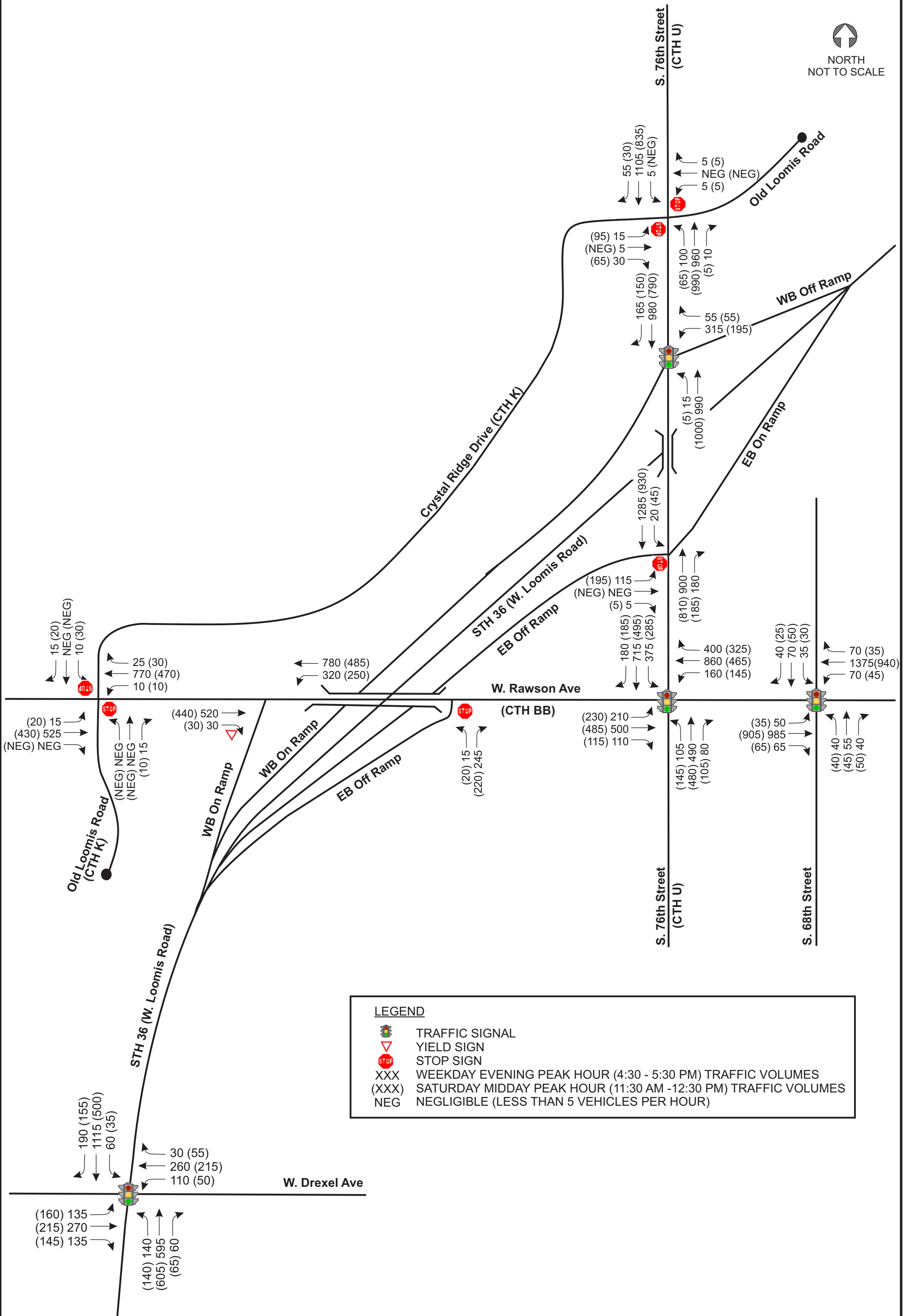


EXHIBIT 2
CONCEPTUAL SITE PLAN - ALTERNATIVE
BALLPARK COMMONS DEVELOPMENT
FRANKLIN, WI



LEGEND

- TRAFFIC SIGNAL
- YIELD SIGN
- STOP SIGN
- EXISTING LANE GEOMETRICS
- EXISTING TURN LANE STORAGE (IN FEET)
- RAISED MEDIAN/DIVIDED ROADWAY SECTION
- DISTANCE BETWEEN ROADWAYS (IN FEET)
- EXISTING BUILDINGS



LEGEND

- TRAFFIC SIGNAL
- YIELD SIGN
- STOP SIGN
- XXX WEEKDAY EVENING PEAK HOUR (4:30 - 5:30 PM) TRAFFIC VOLUMES
- (XXX) SATURDAY MIDDAY PEAK HOUR (11:30 AM - 12:30 PM) TRAFFIC VOLUMES
- NEG NEGLIGIBLE (LESS THAN 5 VEHICLES PER HOUR)

Ballpark Commons
Trip Generation
2014-0960

North of Rawson (Old Area 4)

ITE Code	ITE Land Use		Daily Trips	Weekday PM Peak			Saturday Peak					
				In	Out	Total	In	Out	Total			
220	Apartment 100 Dwelling Units	Trip Rates and Directional	6.65	65%	35%	0.62	50%	50%	0.52			
		Trips	665	40	20	60	25	25	50			
	Stadium Minor League Baseball Stadium 3,500 Seats	Trip Rates and Directional	0.383	98%	2%	0.058	50%	50%	0.00			
		Trips	1340	200	5	205	0	0	0			
432	Facility 1 Golf Center/Tops	Golf Driving Range 40 Tees	N/A	67%	33%	1.25	48%	52%	1.30			
932	High-Turnover (Sit-Down) Restaurant: 6,000 Square Feet	Trip Rates and Directional	127.15	60%	40%	9.85	53%	47%	14.07			
		Trips	765	35	25	60	45	40	85			
495	Facility 2 Recreational Community Center 34,000 Square Feet	Trip Rates and Directional	33.82	49%	51%	2.74	54%	46%	1.07			
932	Entertainment High-Turnover (Sit-Down) Restaurant: 6,000 Square Feet	Trip Rates and Directional	127.15	60%	40%	9.85	53%	47%	14.07			
		Trips	765	35	25	60	45	40	85			
488	Facility 3 Indoor Rec./Baseball Diamonds	Soccer Complex 1 Fields	Trip Rates and Directional	71.33	67%	33%	17.70	48%	52%	30.34		
488	Outdoor Fields Soccer Complex 2 Fields	Trip Rates and Directional	71.33	67%	33%	17.70	48%	52%	30.34			
		Trips	145	25	10	35	30	30	60			
710	General Office Building 24,000 Square Feet	Trip Rates and Directional	11.03	17%	83%	1.49	54%	46%	0.43			
820	General Retail (Shopping Center) 62,000 Square Feet	Trip Rates and Directional	42.70	48%	52%	3.71	52%	48%	4.82			
		Trips	2,645	110	120	230	155	145	300			
932	High-Turnover (Sit-Down) Restaurant: 12,000 Square Feet	Trip Rates and Directional	127.15	60%	40%	9.85	53%	47%	14.07			
		Trips	1,525	70	50	120	90	80	170			
Total Trips			9,335	615	355	970	455	420	875			
			Minus Linked Trips 20%			(1,865)	(125)	(70)	(195)	(90)	(85)	(175)
Driveway Trips			7,470	490	285	775	365	335	700			
			Minus Pass-By Trips (820 & 932) 10%			(335)	(15)	(15)	(30)	(20)	(20)	(40)
New Trips			7,135	475	270	745	345	315	660			

Origin/Destination	Trip Distribution %	Daily Trips	Weekday PM Peak			Saturday Peak		
			In	Out	Total	In	Out	Total
North on 76th Street	20%	1,425	95	55	150	70	80	130
South on 76th Street	15%	1,070	70	40	110	50	50	100
Northeast on STH 36	25%	1,785	120	65	185	85	80	165
Southwest on STH 36	5%	355	25	15	40	20	15	35
East on Rawson Avenue	20%	1,425	95	55	150	70	60	130
West on Rawson Avenue	15%	1,055	70	40	110	50	50	100
Total		7,115	475	270	745	345	315	660

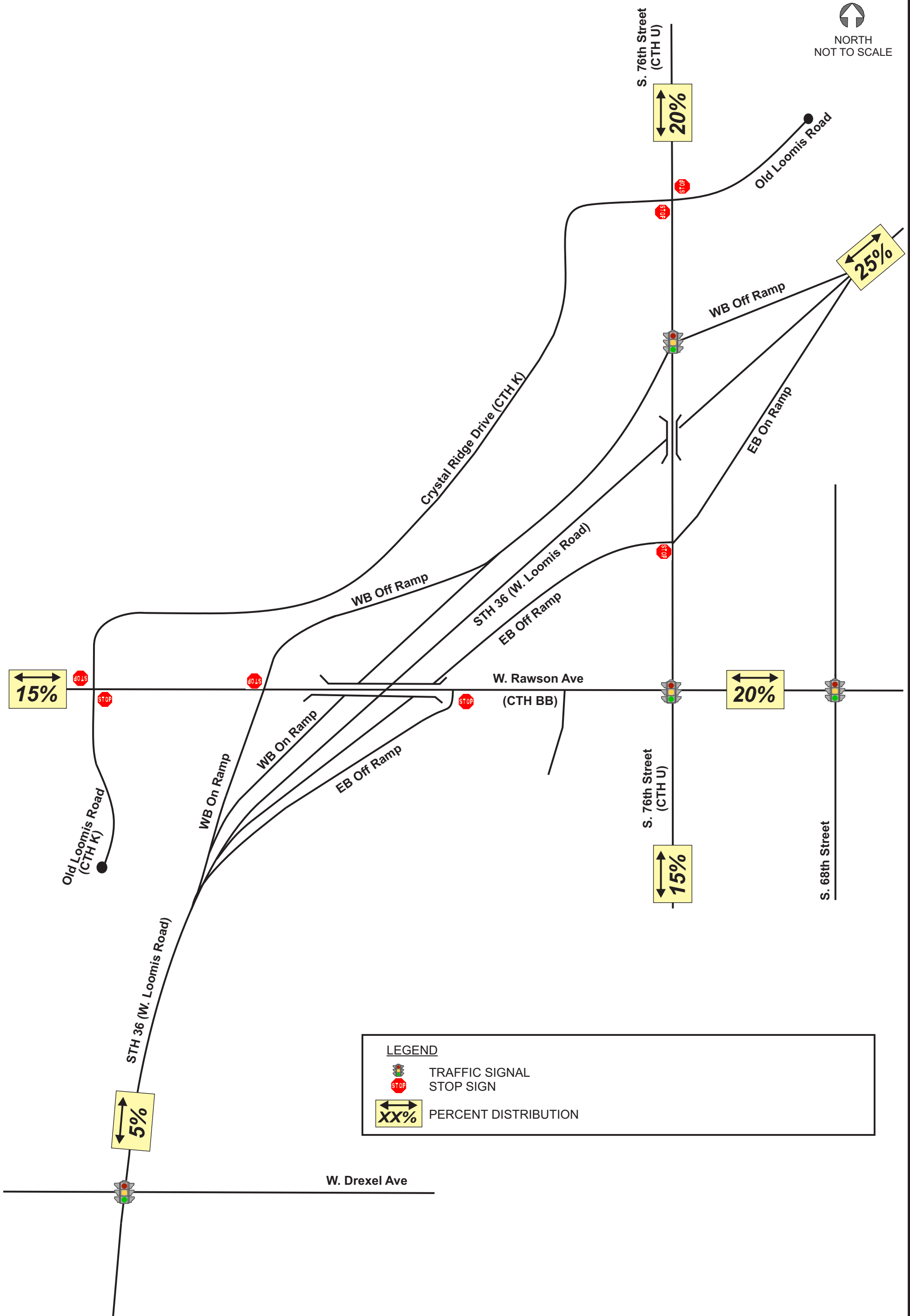
South of Rawson (Old Area 3)

ITE Code	ITE Land Use		Daily Trips	Weekday PM Peak			Saturday Peak					
				In	Out	Total	In	Out	Total			
220	Apartment 273 Dwelling Units	Trip Rates and Directional	6.65	65%	35%	0.62	50%	50%	0.52			
		Trips	1,815	110	60	170	70	70	140			
230	Residential Condominium/Townhouse 30 Dwelling Units	Trip Rates and Directional	5.81	67%	33%	0.52	54%	46%	0.47			
		Trips	175	10	5	15	10	5	15			
310	Hotel 100 Rooms	Trip Rates and Directional	8.17	51%	49%	0.60	56%	44%	0.72			
		Trips	815	30	30	60	40	30	70			
820	General Retail (Shopping Center) 25,000 Square Feet	Trip Rates and Directional	42.70	48%	52%	3.71	52%	48%	4.82			
		Trips	1,070	45	50	95	60	60	120			
Total Trips			3,875	195	145	340	180	165	345			
			Minus Linked Trips 20%			(775)	(40)	(30)	(70)	(35)	(35)	(70)
Driveway Trips			3,100	155	115	270	145	130	275			
			Minus Pass-By Trips (820) 10%			(85)	(5)	(5)	(10)	(5)	(10)	
New Trips			3,015	150	110	260	140	125	265			

Origin/Destination	Trip Distribution %	Daily Trips	Weekday PM Peak			Saturday Peak		
			In	Out	Total	In	Out	Total
North on 76th Street	20%	1,425	30	20	50	30	25	55
South on 76th Street	15%	1,070	25	15	40	20	20	40
Northeast on STH 36	25%	1,785	35	30	65	35	30	65
Southwest on STH 36	5%	355	10	5	15	5	5	10
East on Rawson Avenue	20%	1,425	30	20	50	30	25	55
West on Rawson Avenue	15%	1,055	20	20	40	20	20	40
Total		7,115	150	110	260	140	125	265

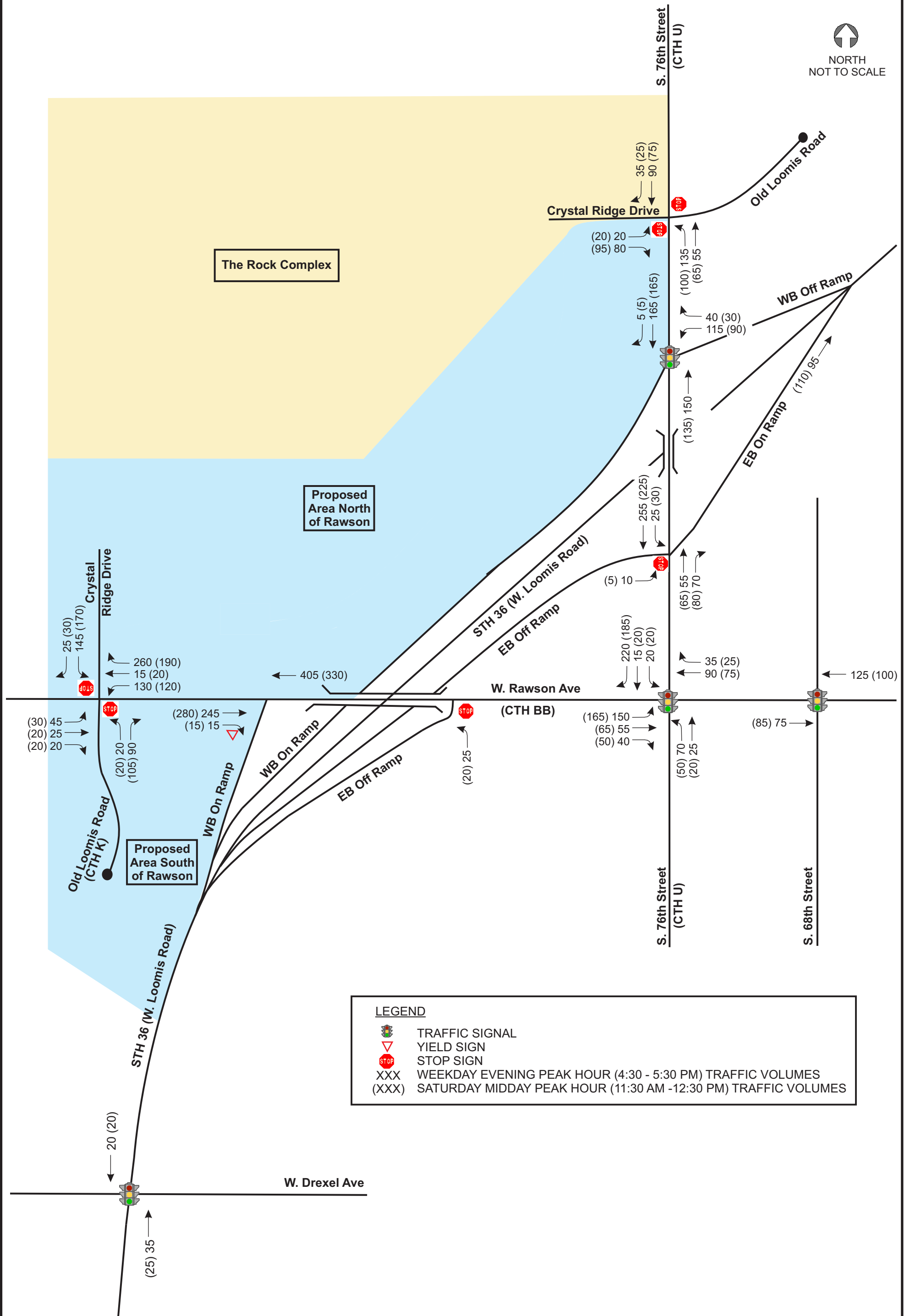
Ballpark Commons Total

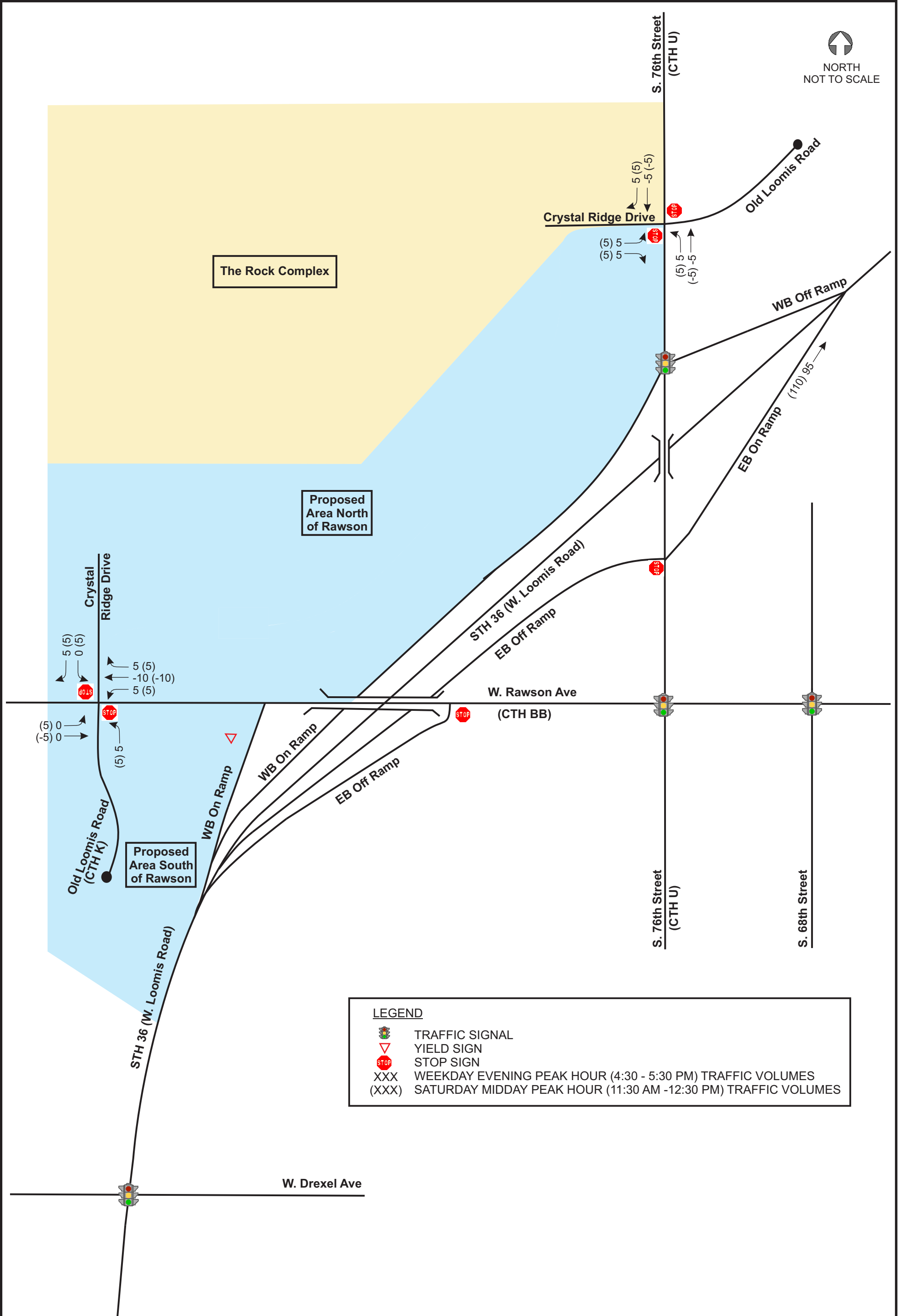
	Daily Trips	Weekday PM Peak			Saturday Peak					
		In	Out	Total	In	Out	Total			
Total Trips	13,210	810	500	1,310	635	585	1,220			
	Minus Total Linked Trips			(2,640)	(165)	(100)	(265)	(125)	(120)	(245)
Total Driveway Trips	10,570	645	400	1,045	510	465	975			
	Minus Total Pass-By Trips			(420)	(20)	(20)	(40)	(25)	(25)	(50)
Total New Trips	10,150	625	380	1,005	485	440	925			



LEGEND

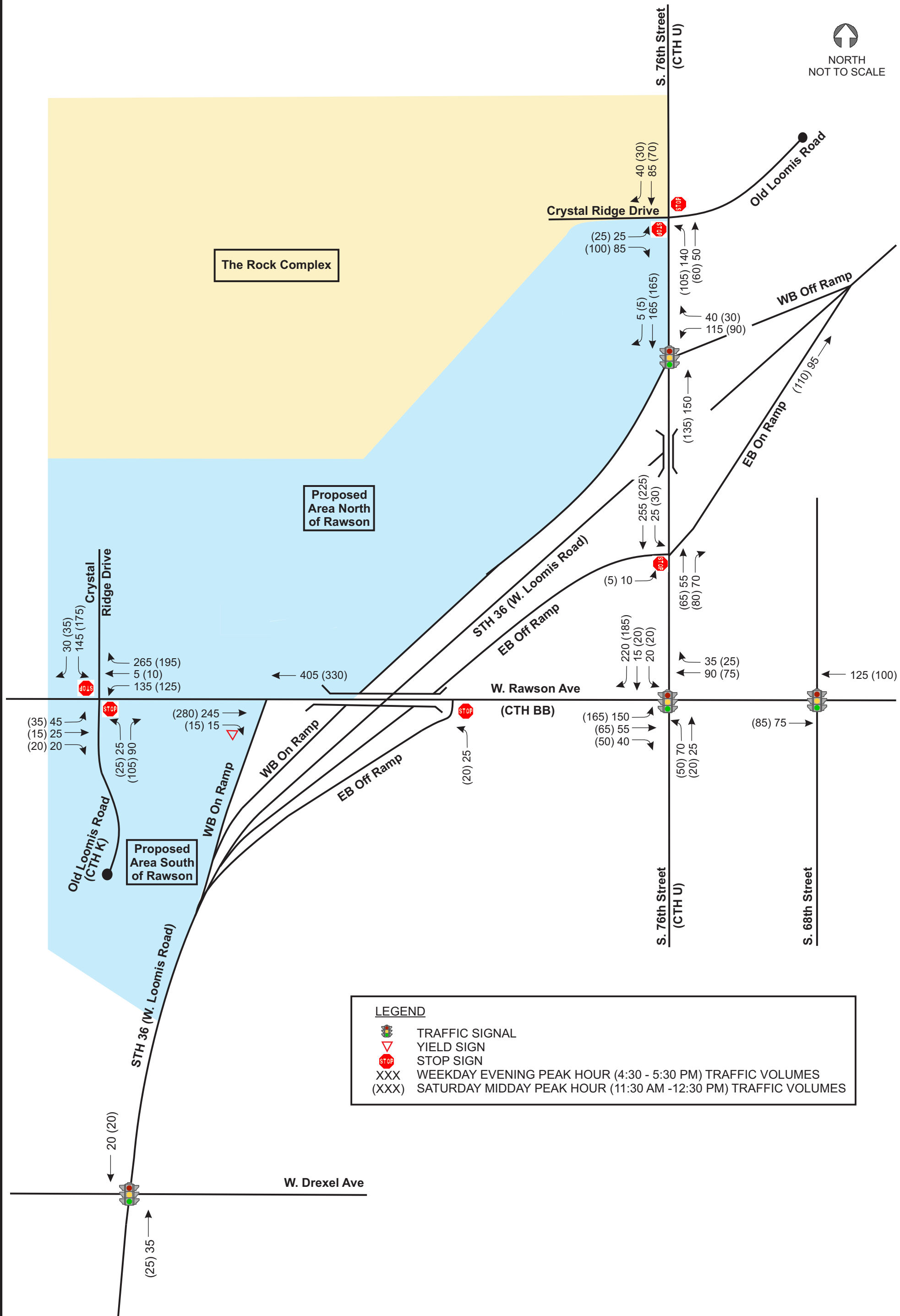
- TRAFFIC SIGNAL
- STOP SIGN
- XX% PERCENT DISTRIBUTION





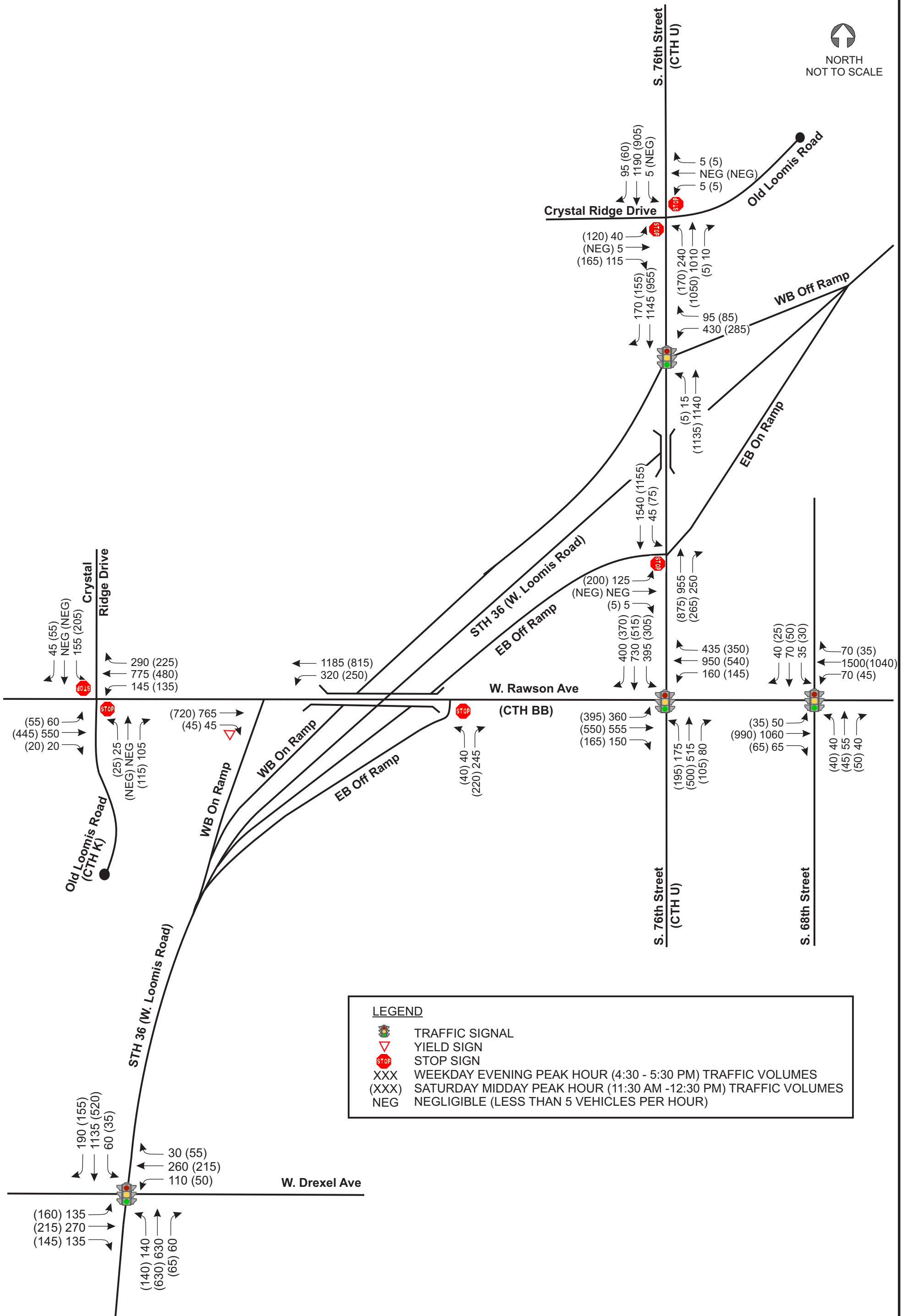
LEGEND

- TRAFFIC SIGNAL
- YIELD SIGN
- STOP SIGN
- XXX WEEKDAY EVENING PEAK HOUR (4:30 - 5:30 PM) TRAFFIC VOLUMES
- (XXX) SATURDAY MIDDAY PEAK HOUR (11:30 AM - 12:30 PM) TRAFFIC VOLUMES



LEGEND

- TRAFFIC SIGNAL
- YIELD SIGN
- STOP SIGN
- XXX WEEKDAY EVENING PEAK HOUR (4:30 - 5:30 PM) TRAFFIC VOLUMES
- (XXX) SATURDAY MIDDAY PEAK HOUR (11:30 AM - 12:30 PM) TRAFFIC VOLUMES



LEGEND

- TRAFFIC SIGNAL
- YIELD SIGN
- STOP SIGN
- XXX WEEKDAY EVENING PEAK HOUR (4:30 - 5:30 PM) TRAFFIC VOLUMES
- (XXX) SATURDAY MIDDAY PEAK HOUR (11:30 AM - 12:30 PM) TRAFFIC VOLUMES
- NEG NEGLIGIBLE (LESS THAN 5 VEHICLES PER HOUR)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach												Overall LOS
			Eastbound			Westbound			Northbound			Southbound			
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
STH 36 (W. Loomis Road) & W. Drexel Avenue	Traffic Signal	PM	C	C	B	C	C		B	A	A	B	D	B	C
		SAT	C	B	B	B	B		B	B	A	B	B	B	B
W. Rawson Avenue (CTH BB) & W. Crystal Ridge Drive	Two-Way Stop Control	PM	A	A	A	A	A	A	C			F ¹			--
		SAT	A	A	A	A	A	A	B			F ²			--
W. Rawson Avenue (CTH BB) & STH 36 (W. Loomis Road) Westbound ramps	Two-Way Stop Control	PM	--	A	A	B	A	--	--	--	--	--	--	--	--
		SAT	--	A	A	B	A	--	--	--	--	--	--	--	--
W. Rawson Avenue (CTH BB) & STH 36 (W. Loomis Road) Eastbound ramps	Two-Way Stop Control	PM	--	A	--	--	A	--	D			--	--	--	--
		SAT	--	A	--	--	A	--	C			--	--	--	--
W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U)	Traffic Signal	PM	F ³	C	C	B	C	B	D	D	C	F ⁴	D	F ⁵	E
		SAT	D	C	C	C	C	C	D	D	C	C	C	D	C
W. Rawson Avenue (CTH BB) & S. 68 th Street	Traffic Signal	PM	A	A	A	A	B	A	F ⁶		C	E ⁷		C	B
		SAT	A	B	B	A	B	A	F ⁸		C	D		C	B
S. 76th Street (CTH U) & W. Crystal Ridge Drive	Two-Way Stop Control	PM	F ⁹			F ¹⁰			C	A	A	C	A	A	--
		SAT	F ¹¹			F ¹²			B	A	A	C	A	A	--
S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Westbound ramps	Traffic Signal	PM	--	--	--	C		A	B	B	--	--	B		B
		SAT	--	--	--	B		A	B	A	--	--	A		A
S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Eastbound ramps	Two-Way Stop Control	PM	F ¹³		C	--	--	--	--	A	A	C	A	--	--
		SAT	F ¹⁴		B	--	--	--	--	A	A	C	A	--	--

Notes: (--) indicates a movement that is not possible

- ¹ delay = 266.8 sec; v/c = 1.39
- ² delay = 206.2 sec; v/c = 1.30
- ³ delay = 107.4 sec; v/c = 1.20
- ⁴ delay = 123.6 sec; v/c = 1.15
- ⁵ delay = 111.1 sec; v/c = 1.10
- ⁶ delay = 97.8 sec; v/c = 0.76
- ⁷ delay = 78.5 sec; v/c = 0.69
- ⁸ delay = 83.2 sec; v/c = 0.71
- ⁹ delay = 209.5 sec; v/c = 1.23
- ¹⁰ delay = 290.8 sec; v/c = 0.54
- ¹¹ delay = 245.8 sec; v/c = 1.40
- ¹² delay = 53.3 sec; v/c = 0.14
- ¹³ delay = 604.4 sec; v/c = 2.01
- ¹⁴ delay = 529.7 sec; v/c = 1.95

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach												Overall LOS
			Eastbound			Westbound			Northbound			Southbound			
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
STH 36 (W. Loomis Road) & W. Drexel Avenue	Traffic Signal	PM	C	C	B	C	C		B	A	A	B	D	B	C
		SAT	C	B	B	B	B		B	B	A	B	B	B	B
W. Rawson Avenue (CTH BB) & W. Crystal Ridge Drive	Traffic Signal	PM	B	A	A	A	A	A	B			B			A
		SAT	B	A	A	B	A	A	B			B			B
W. Rawson Avenue (CTH BB) & STH 36 (W. Loomis Road) Westbound ramps	Two-Way Stop Control	PM	--	A	A	B	A	--	--	--	--	--	--	--	--
		SAT	--	A	A	B	A	--	--	--	--	--	--	--	--
W. Rawson Avenue (CTH BB) & STH 36 (W. Loomis Road) Eastbound ramps	Two-Way Stop Control	PM	--	A	--	--	A	--	D			--	--	--	--
		SAT	--	A	--	--	A	--	C			--	--	--	--
W. Rawson Avenue (CTH BB) & S. 76th Street (CTH U)	Traffic Signal	PM	F ¹	C	C	C	F ²	C	D	D	C	F ³	D	F ⁴	E
		SAT	D	C	C	C	D	D	D	D	C	C	D	D	D
W. Rawson Avenue (CTH BB) & S. 68 th Street	Traffic Signal	PM	B	B	A	A	B	A	D		C	D		C	B
		SAT	A	B	A	A	B	A	D		C	C		C	B
S. 76th Street (CTH U) & W. Crystal Ridge Drive	Traffic Signal	PM	D			C			C	A	A	A	A	A	A
		SAT	D			C			A	A	A	A	A	A	A
S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Westbound ramps	Traffic Signal	PM	--	--	--	D		A	A	A	--	--	C		B
		SAT	--	--	--	D		A	A	A	--	--	B		B
S. 76th Street (CTH U) & STH 36 (W. Loomis Road) Eastbound ramps	Traffic Signal	PM	D		A	--	--	--	--	A	A	A	A	--	A
		SAT	D		A	--	--	--	--	A	A	A	A	--	A

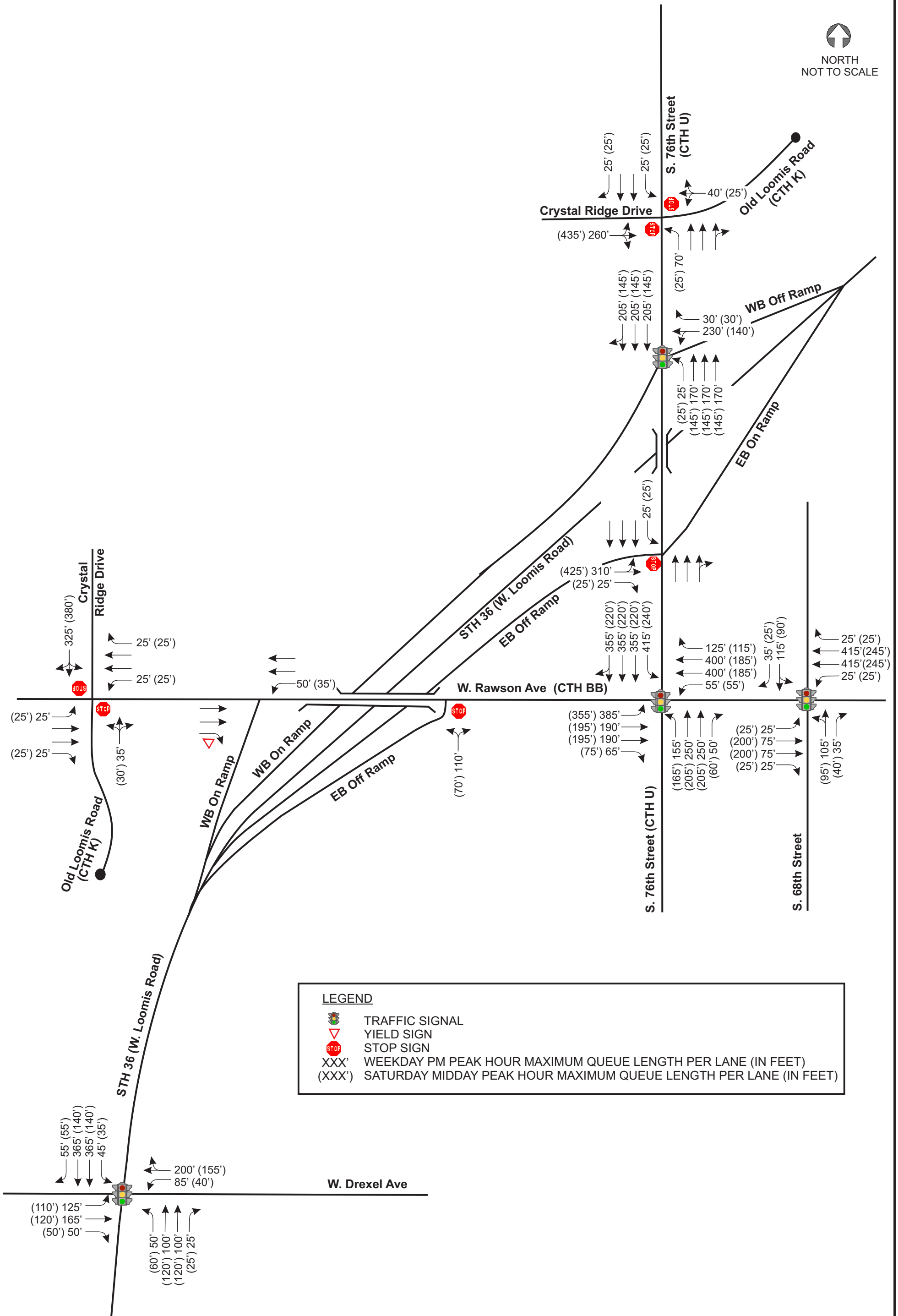
Notes: (--) indicates a movement that is not possible

¹ delay = 111.7 sec; v/c = 1.12

² delay = 71.4 sec; v/c = 1.05

³ delay = 98.3 sec; v/c = 1.09

⁴ delay = 85.3 sec; v/c = 1.01

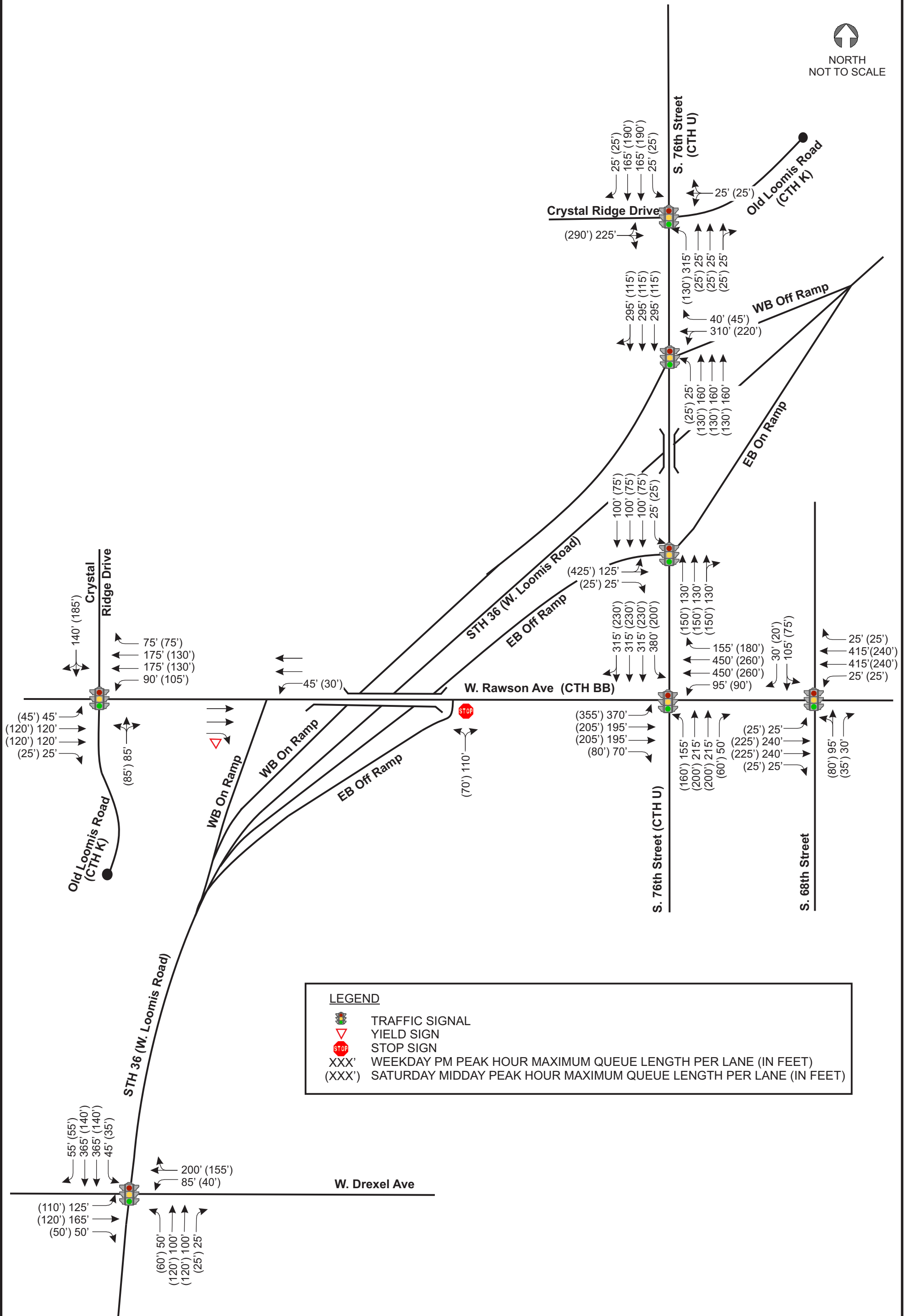


LEGEND

- TRAFFIC SIGNAL
- YIELD SIGN
- STOP SIGN
- XXX' WEEKDAY PM PEAK HOUR MAXIMUM QUEUE LENGTH PER LANE (IN FEET)
- (XXX') SATURDAY MIDDAY PEAK HOUR MAXIMUM QUEUE LENGTH PER LANE (IN FEET)

EXHIBIT 13
YEAR 2032 TOTAL TRAFFIC
WITH EXISTING TRAFFIC CONTROL - MAXIMUM QUEUES
BALLPARK COMMONS DEVELOPMENT
FRANKLIN, WI





LEGEND

- TRAFFIC SIGNAL
- YIELD SIGN
- STOP SIGN
- XXX' WEEKDAY PM PEAK HOUR MAXIMUM QUEUE LENGTH PER LANE (IN FEET)
- (XXX') SATURDAY MIDDAY PEAK HOUR MAXIMUM QUEUE LENGTH PER LANE (IN FEET)

EXHIBIT 14
YEAR 2032 TOTAL TRAFFIC
WITH TRAFFIC SIGNAL CONTROL - MAXIMUM QUEUES
BALLPARK COMMONS DEVELOPMENT
FRANKLIN, WI
























Appendix 1

Design Year (Year 2032) Traffic Operational Analysis
With Existing Traffic Control

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

28: STH 36 & Drexel Ave
























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	135	270	135	110	260	30	140	630	60	60	1135	190
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	1845	1845	1845	1863	1863	1863
Adj Flow Rate, veh/h	145	290	73	118	280	32	151	677	32	65	1220	102
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	3	3	3	2	2	2
Cap, veh/h	227	470	400	238	415	47	292	1835	821	383	1254	561
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.09	0.52	0.52	0.35	0.35	0.35
Sat Flow, veh/h	1063	1863	1583	1015	1642	188	1757	3505	1568	737	3539	1583
Grp Volume(v), veh/h	145	290	73	118	0	312	151	677	32	65	1220	102
Grp Sat Flow(s),veh/h/ln	1063	1863	1583	1015	0	1830	1757	1752	1568	737	1770	1583
Q Serve(g_s), s	5.8	8.1	2.1	6.8	0.0	9.1	2.9	6.7	0.6	3.7	20.0	2.6
Cycle Q Clear(g_c), s	14.9	8.1	2.1	14.9	0.0	9.1	2.9	6.7	0.6	3.7	20.0	2.6
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	470	400	238	0	462	292	1835	821	383	1254	561
V/C Ratio(X)	0.64	0.62	0.18	0.49	0.00	0.68	0.52	0.37	0.04	0.17	0.97	0.18
Avail Cap(c_a), veh/h	227	470	400	238	0	462	322	1895	848	383	1254	561
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	27.4	19.5	17.3	26.2	0.0	19.9	13.1	8.3	6.8	13.5	18.8	13.1
Incr Delay (d2), s/veh	4.5	1.8	0.1	0.6	0.0	3.2	0.5	0.1	0.0	0.2	19.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.4	0.9	1.9	0.0	4.9	1.4	3.2	0.3	0.8	13.0	1.2
LnGrp Delay(d),s/veh	31.9	21.3	17.4	26.7	0.0	23.1	13.6	8.4	6.9	13.7	38.0	13.3
LnGrp LOS	C	C	B	C		C	B	A	A	B	D	B
Approach Vol, veh/h		508			430			860			1387	
Approach Delay, s/veh		23.8			24.1			9.3			35.0	
Approach LOS		C			C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		37.0		22.0	10.0	27.0		22.0				
Change Period (Y+Rc), s		* 6.1		7.1	4.5	* 6.1		7.1				
Max Green Setting (Gmax), s		* 32		14.9	6.5	* 21		14.9				
Max Q Clear Time (g_c+I1), s		8.7		16.9	4.9	22.0		16.9				
Green Ext Time (p_c), s		14.7		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			24.8									
HCM 2010 LOS			C									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

28: STH 36 & Drexel Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	270	135	110	260	30	140	630	60	60	1135	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		130	195		0	390		230	350		145
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.985				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1835	0	1752	3505	1568	1770	3539	1583
Flt Permitted	0.479			0.524			0.156			0.394		
Satd. Flow (perm)	892	1863	1583	976	1835	0	288	3505	1568	734	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		569			956			666			3068	
Travel Time (s)		11.1			18.6			10.1			46.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	145	290	73	118	280	32	151	677	32	65	1220	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	145	290	73	118	312	0	151	677	32	65	1220	102
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		6.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.1	23.1	23.1	23.1	23.1		10.5	22.1	22.1	22.1	22.1	22.1
Total Split (s)	22.0	22.0	22.0	22.0	22.0		11.0	38.0	38.0	27.0	27.0	27.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%		18.3%	63.3%	63.3%	45.0%	45.0%	45.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		1.0	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1		4.5	6.1	6.1	6.1	6.1	6.1
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	Min
Act Effect Green (s)	13.0	13.0	13.0	13.0	13.0		31.2	29.5	29.5	21.2	21.2	21.2
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23		0.56	0.53	0.53	0.38	0.38	0.38
v/c Ratio	0.70	0.67	0.20	0.52	0.73		0.46	0.37	0.04	0.23	0.91	0.17
Control Delay	41.8	28.8	19.7	29.1	32.4		10.9	8.5	6.8	16.7	31.0	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	28.8	19.7	29.1	32.4		10.9	8.5	6.8	16.7	31.0	14.4
LOS	D	C	B	C	C		B	A	A	B	C	B
Approach Delay		31.2			31.5			8.8			29.1	
Approach LOS		C			C			A			C	
Queue Length 50th (ft)	47	93	21	37	102		23	65	5	16	218	24

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

28: STH 36 & Drexel Ave

Lanes, Volumes, Timings

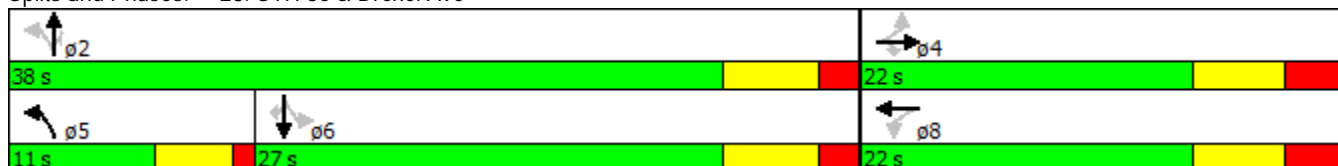


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	#122	164	50	82	#199		47	98	15	44	#361	55
Internal Link Dist (ft)		489			876			586			2988	
Turn Bay Length (ft)	130		130	195			390		230	350		145
Base Capacity (vph)	241	503	427	263	495		333	2027	907	278	1341	600
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.58	0.17	0.45	0.63		0.45	0.33	0.04	0.23	0.91	0.17

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 55.9
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 24.3
 Intersection LOS: C
 Intersection Capacity Utilization 83.6%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 28: STH 36 & Drexel Ave



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

HCM 2010 TWSC

Intersection													
Int Delay, s/veh	26.6												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	60	550	20	145	775	290	25	1	105	155	1	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	100	125	-	165	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	22	22	22
Mvmt Flow	61	561	20	148	791	296	26	1	107	158	1	46

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	791	0	0	561	0	0	1376	1771	281	1491	1771	395
Stage 1	-	-	-	-	-	-	684	684	-	1087	1087	-
Stage 2	-	-	-	-	-	-	692	1087	-	404	684	-
Critical Hdwy	4.16	-	-	4.14	-	-	7.54	6.54	6.94	7.94	6.94	7.34
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.94	5.94	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.94	5.94	-
Follow-up Hdwy	2.23	-	-	2.22	-	-	3.52	4.02	3.32	3.72	4.22	3.52
Pot Cap-1 Maneuver	819	-	-	1006	-	-	104	82	716	~ 71	67	551
Stage 1	-	-	-	-	-	-	405	447	-	198	251	-
Stage 2	-	-	-	-	-	-	400	290	-	543	401	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	819	-	-	1006	-	-	79	65	716	~ 50	53	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	171	141	-	~ 122	124	-
Stage 1	-	-	-	-	-	-	375	414	-	183	214	-
Stage 2	-	-	-	-	-	-	311	247	-	426	371	-

























Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.1	16.8	266.8
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	437	819	-	-	1006	-	-	148
HCM Lane V/C Ratio	0.306	0.075	-	-	0.147	-	-	1.386
HCM Control Delay (s)	16.8	9.8	-	-	9.2	-	-	266.8
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.3	0.2	-	-	0.5	-	-	13

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

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Volume (vph)	60	550	20	145	775	290	25	1	105	155	1	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		100	125		165	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.892				0.970
Flt Protected	0.950			0.950				0.990				0.963
Satd. Flow (prot)	1752	3505	1568	1770	3539	1583	0	1645	0	0	1455	0
Flt Permitted	0.950			0.950				0.990				0.963
Satd. Flow (perm)	1752	3505	1568	1770	3539	1583	0	1645	0	0	1455	0
Link Speed (mph)		40			40			35				35
Link Distance (ft)		1015			447			386				310
Travel Time (s)		17.3			7.6			7.5				6.0
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
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	22%	22%	22%
Adj. Flow (vph)	61	561	20	148	791	296	26	1	107	158	1	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	561	20	148	791	296	0	134	0	0	205	0
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.8%
Analysis Period (min)	15
	ICU Level of Service A

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 24: STH 36 NB Off Ramp & Rawson Ave

HCM 2010 TWSC

Intersection

Int Delay, s/veh 2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	765	0	0	1505	40	245
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	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	814	0	0	1601	43	261

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	814	1615
Stage 1	-	-	814
Stage 2	-	-	801
Critical Hdwy	-	4.14	6.9
Critical Hdwy Stg 1	-	-	5.9
Critical Hdwy Stg 2	-	-	5.9
Follow-up Hdwy	-	2.22	3.55
Pot Cap-1 Maneuver	-	809	92
Stage 1	-	-	389
Stage 2	-	-	395
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	809	92
Mov Cap-2 Maneuver	-	-	221
Stage 1	-	-	389
Stage 2	-	-	395

Approach	EB	WB	NB
HCM Control Delay, s	0	0	25
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	475	-	-	809	-
HCM Lane V/C Ratio	0.638	-	-	-	-
HCM Control Delay (s)	25	-	-	0	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	4.4	-	-	0	-

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 24: STH 36 NB Off Ramp & Rawson Ave

Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	765	0	0	1505	40	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt					0.884	
Flt Protected					0.993	
Satd. Flow (prot)	3539	0	0	3539	1588	0
Flt Permitted					0.993	
Satd. Flow (perm)	3539	0	0	3539	1588	0
Link Speed (mph)	40			40	30	
Link Distance (ft)	954			755	294	
Travel Time (s)	16.3			12.9	6.7	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	814	0	0	1601	43	261
Shared Lane Traffic (%)						
Lane Group Flow (vph)	814	0	0	1601	304	0
Sign Control	Free			Free	Stop	

























Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.6%
Analysis Period (min)	15
	ICU Level of Service C

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

6: 76th St & Rawson Ave






























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	360	555	150	160	950	435	175	515	80	395	730	400
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	1845	1845	1845	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	375	578	78	167	990	227	182	536	42	411	760	417
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	3	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, %	3	3	3	2	2	2	2	2	2	2	2	2
Cap, veh/h	335	1216	544	402	1062	475	218	610	273	357	810	378
Arrive On Green	0.13	0.35	0.35	0.17	0.60	0.60	0.08	0.17	0.17	0.14	0.24	0.24
Sat Flow, veh/h	1757	3505	1568	1774	3539	1583	1774	3539	1583	1774	3390	1583
Grp Volume(v), veh/h	375	578	78	167	990	227	182	536	42	411	760	417
Grp Sat Flow(s),veh/h/ln	1757	1752	1568	1774	1770	1583	1774	1770	1583	1774	1695	1583
Q Serve(g_s), s	12.0	11.6	3.1	5.8	22.9	7.2	7.0	13.3	2.0	13.0	19.8	21.5
Cycle Q Clear(g_c), s	12.0	11.6	3.1	5.8	22.9	7.2	7.0	13.3	2.0	13.0	19.8	21.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	335	1216	544	402	1062	475	218	610	273	357	810	378
V/C Ratio(X)	1.12	0.48	0.14	0.42	0.93	0.48	0.83	0.88	0.15	1.15	0.94	1.10
Avail Cap(c_a), veh/h	335	1216	544	446	1062	475	218	610	273	357	810	378
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	23.0	20.2	17.3	17.2	14.0	30.6	36.3	31.7	27.7	33.6	34.3
Incr Delay (d2), s/veh	85.3	1.3	0.6	0.5	12.3	2.5	23.5	13.9	0.3	95.9	18.4	76.8
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(50%),veh/ln	16.2	5.8	1.4	2.8	12.5	3.4	2.5	7.7	0.9	16.5	11.4	17.4
LnGrp Delay(d),s/veh	107.4	24.3	20.7	17.8	29.5	16.6	54.1	50.2	31.9	123.6	52.0	111.1
LnGrp LOS	F	C	C	B	C	B	D	D	C	F	D	F
Approach Vol, veh/h		1031			1384			760			1588	
Approach Delay, s/veh		54.3			25.9			50.2			86.0	
Approach LOS		D			C			D			F	
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	18.0	22.0	12.8	37.2	12.0	28.0	17.0	33.0				
Change Period (Y+Rc), s	5.0	6.5	5.0	6.0	5.0	6.5	5.0	6.0				
Max Green Setting (Gmax), s	13.0	15.5	10.0	29.0	7.0	21.5	12.0	27.0				
Max Q Clear Time (g_c+I1), s	15.0	15.3	7.8	13.6	9.0	23.5	14.0	24.9				
Green Ext Time (p_c), s	0.0	0.2	0.1	9.8	0.0	0.0	0.0	1.8				
Intersection Summary												
HCM 2010 Ctrl Delay			56.0									
HCM 2010 LOS			E									

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

6: 76th St & Rawson Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			  	
Volume (vph)	360	555	150	160	950	435	175	515	80	395	730	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		165	50		125	150		0	100		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.947	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3505	1568	1770	3539	1583	1770	3539	1583	1770	4816	0
Flt Permitted	0.134			0.379			0.258			0.195		
Satd. Flow (perm)	247	3505	1568	706	3539	1583	481	3539	1583	363	4816	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		755			2655			785			673	
Travel Time (s)		12.9			45.3			13.4			11.5	
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
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	375	578	78	167	990	227	182	536	42	411	760	417
Shared Lane Traffic (%)												
Lane Group Flow (vph)	375	578	78	167	990	227	182	536	42	411	1177	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	15.0	15.0	7.0	15.0	
Minimum Split (s)	12.0	21.0	21.0	12.0	21.0	21.0	12.0	21.5	21.5	12.0	21.5	
Total Split (s)	17.0	35.0	35.0	15.0	33.0	33.0	12.0	22.0	22.0	18.0	28.0	
Total Split (%)	18.9%	38.9%	38.9%	16.7%	36.7%	36.7%	13.3%	24.4%	24.4%	20.0%	31.1%	
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	2.5	2.5	1.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	Min	Min	None	Min	
Act Effect Green (s)	42.8	29.8	29.8	37.2	27.0	27.0	24.0	15.5	15.5	35.0	21.5	
Actuated g/C Ratio	0.48	0.33	0.33	0.41	0.30	0.30	0.27	0.17	0.17	0.39	0.24	
v/c Ratio	1.18	0.50	0.15	0.42	0.93	0.48	0.80	0.88	0.15	1.19	1.10dr	
Control Delay	133.5	26.1	22.7	13.3	38.1	22.2	48.3	53.9	33.5	136.9	67.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	133.5	26.1	22.7	13.3	38.1	22.2	48.3	53.9	33.5	136.9	67.6	
LOS	F	C	C	B	D	C	D	D	C	F	E	
Approach Delay		64.9			32.5			51.5			85.6	
Approach LOS		E			C			D			F	
Queue Length 50th (ft)	-210	138	31	19	288	75	69	157	21	-232	-255	

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

6: 76th St & Rawson Ave

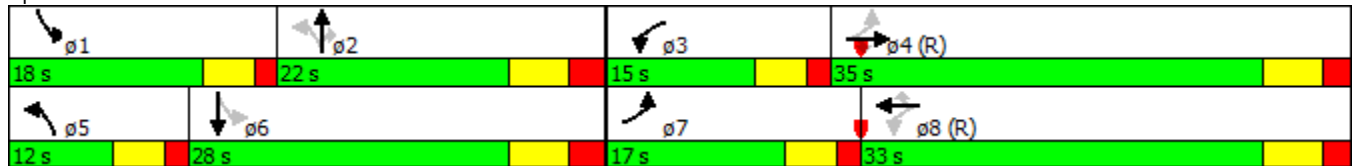
Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	#384	190	65	m54	#400	124	#153	#247	50	#414	#352	
Internal Link Dist (ft)		675			2575			705			593	
Turn Bay Length (ft)	75		165	50		125	150			100		
Base Capacity (vph)	317	1161	519	416	1061	474	228	609	272	344	1150	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.50	0.15	0.40	0.93	0.48	0.80	0.88	0.15	1.19	1.02	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 51 (57%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.19
 Intersection Signal Delay: 60.2 Intersection LOS: E
 Intersection Capacity Utilization 101.1% ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.























Splits and Phases: 6: 76th St & Rawson Ave



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

3: 68th St & Rawson Ave

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	1060	65	70	1500	70	40	55	40	35	70	40
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	1845	1845	1845	1863	1863	1863	1900	1845	1845	1900	1863	1863
Adj Flow Rate, veh/h	53	1128	35	74	1596	37	43	59	21	37	74	21
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	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, %	3	3	3	2	2	2	3	3	3	2	2	2
Cap, veh/h	271	2126	951	488	2177	974	57	55	226	53	75	229
Arrive On Green	0.11	1.00	1.00	0.07	0.62	0.62	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1757	3505	1568	1774	3539	1583	0	378	1568	0	522	1583
Grp Volume(v), veh/h	53	1128	35	74	1596	37	102	0	21	111	0	21
Grp Sat Flow(s),veh/h/ln	1757	1752	1568	1774	1770	1583	378	0	1568	522	0	1583
Q Serve(g_s), s	0.9	0.0	0.0	1.3	28.4	0.8	0.0	0.0	1.0	0.0	0.0	1.0
Cycle Q Clear(g_c), s	0.9	0.0	0.0	1.3	28.4	0.8	13.0	0.0	1.0	13.0	0.0	1.0
Prop In Lane	1.00		1.00	1.00		1.00	0.42		1.00	0.33		1.00
Lane Grp Cap(c), veh/h	271	2126	951	488	2177	974	112	0	226	129	0	229
V/C Ratio(X)	0.20	0.53	0.04	0.15	0.73	0.04	0.91	0.00	0.09	0.86	0.00	0.09
Avail Cap(c_a), veh/h	317	2126	951	520	2177	974	112	0	226	129	0	229
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.56	0.56	0.56	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.7	0.0	0.0	5.0	12.1	6.8	38.7	0.0	33.4	37.4	0.0	33.4
Incr Delay (d2), s/veh	0.2	0.5	0.0	0.1	2.2	0.1	59.1	0.0	0.2	41.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.2	0.0	0.6	14.4	0.4	4.4	0.0	0.5	4.2	0.0	0.5
LnGrp Delay(d),s/veh	9.9	0.5	0.0	5.2	14.4	6.9	97.8	0.0	33.6	78.5	0.0	33.6
LnGrp LOS	A	A	A	A	B	A	F		C	E		C
Approach Vol, veh/h		1216			1707			123			132	
Approach Delay, s/veh		0.9			13.8			86.9			71.4	
Approach LOS		A			B			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.0	10.4	60.6		19.0	9.6	61.4				
Change Period (Y+Rc), s		6.0	4.5	6.0		6.0	4.5	6.0				
Max Green Setting (Gmax), s		13.0	7.5	53.0		13.0	7.5	53.0				
Max Q Clear Time (g_c+I1), s		15.0	3.3	2.0		15.0	2.9	30.4				
Green Ext Time (p_c), s		0.0	0.0	36.4		0.0	0.0	19.1				
Intersection Summary												
HCM 2010 Ctrl Delay			14.1									
HCM 2010 LOS			B									

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

3: 68th St & Rawson Ave

Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1060	65	70	1500	70	40	55	40	35	70	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	205		115	200		125	0		100	0		100
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.979			0.984	
Satd. Flow (prot)	1752	3505	1568	1770	3539	1583	0	1806	1568	0	1833	1583
Flt Permitted	0.106			0.205				0.812			0.849	
Satd. Flow (perm)	196	3505	1568	382	3539	1583	0	1498	1568	0	1581	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		2655			544			394			1251	
Travel Time (s)		45.3			9.3			9.0			28.4	
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
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	53	1128	35	74	1596	37	43	59	21	37	74	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	1128	35	74	1596	37	0	102	21	0	111	21
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	21.0	21.0	11.5	21.0	21.0	16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	12.0	59.0	59.0	12.0	59.0	59.0	19.0	19.0	19.0	19.0	19.0	19.0
Total Split (%)	13.3%	65.6%	65.6%	13.3%	65.6%	65.6%	21.1%	21.1%	21.1%	21.1%	21.1%	21.1%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effect Green (s)	67.5	61.6	61.6	68.6	64.0	64.0		11.5	11.5		11.5	11.5
Actuated g/C Ratio	0.75	0.68	0.68	0.76	0.71	0.71		0.13	0.13		0.13	0.13
v/c Ratio	0.20	0.47	0.03	0.18	0.63	0.03		0.53	0.10		0.55	0.10
Control Delay	4.4	6.3	5.2	4.2	11.6	7.3		47.1	35.2		47.3	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	4.4	6.3	5.2	4.2	11.6	7.3		47.1	35.2		47.3	35.2
LOS	A	A	A	A	B	A		D	D		D	D
Approach Delay		6.2			11.2			45.1			45.4	
Approach LOS		A			B			D			D	
Queue Length 50th (ft)	6	104	6	9	309	8		55	11		60	11

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

3: 68th St & Rawson Ave

Lanes, Volumes, Timings

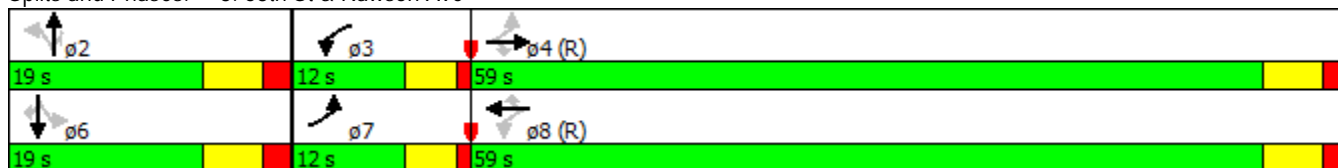


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	m7	m71	m6	20	415	20		105	32		112	32
Internal Link Dist (ft)		2575			464			314			1171	
Turn Bay Length (ft)	205		115	200		125			100			100
Base Capacity (vph)	277	2398	1073	407	2514	1125		216	226		228	228
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.19	0.47	0.03	0.18	0.63	0.03		0.47	0.09		0.49	0.09

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green, Master Intersection
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 12.0 Intersection LOS: B
 Intersection Capacity Utilization 73.3% ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: 68th St & Rawson Ave



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

HCM 2010 TWSC

Intersection												
Int Delay, s/veh	15.1											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	40	5	115	5	1	5	240	1010	10	5	1190	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	100	-	100
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	5	125	5	1	5	261	1098	11	5	1293	103

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2265	2934	647	2285	2929	554	1293	0	0	1109	0	0
Stage 1	1304	1304	-	1625	1625	-	-	-	-	-	-	-
Stage 2	961	1630	-	660	1304	-	-	-	-	-	-	-
Critical Hdwy	7.01	6.56	6.96	6.99	6.54	7.14	4.14	-	-	5.34	-	-
Critical Hdwy Stg 1	6.56	5.56	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.76	5.56	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4.03	3.33	3.67	4.02	3.92	2.22	-	-	3.12	-	-
Pot Cap-1 Maneuver	~ 31	15	411	30	15	408	532	-	-	347	-	-
Stage 1	165	227	-	73	159	-	-	-	-	-	-	-
Stage 2	253	157	-	406	229	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	~ 19	8	411	12	8	408	532	-	-	347	-	-
Mov Cap-2 Maneuver	53	54	-	10	~ -88	-	-	-	-	-	-	-
Stage 1	84	224	-	37	81	-	-	-	-	-	-	-
Stage 2	125	80	-	272	226	-	-	-	-	-	-	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s	209.5	290.8	3.4	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	532	-	-	142	22	347	-	-
HCM Lane V/C Ratio	0.49	-	-	1.225	0.543	0.016	-	-
HCM Control Delay (s)	18.1	-	-	209.5	290.8	15.5	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	2.7	-	-	10.3	1.6	0	-	-

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

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	5	115	5	1	5	240	1010	10	5	1190	95
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	125		0	100		100
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Frt		0.902			0.939			0.999				0.850
Flt Protected		0.988			0.978		0.950			0.950		
Satd. Flow (prot)	0	1644	0	0	1711	0	1770	5080	0	1770	3539	1583
Flt Permitted		0.988			0.978		0.950			0.950		
Satd. Flow (perm)	0	1644	0	0	1711	0	1770	5080	0	1770	3539	1583
Link Speed (mph)		35			35			40				40
Link Distance (ft)		558			782			302				707
Travel Time (s)		10.9			15.2			5.1				12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	43	5	125	5	1	5	261	1098	11	5	1293	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	11	0	261	1109	0	5	1293	103
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized



















Intersection Capacity Utilization 66.6% ICU Level of Service C

Analysis Period (min) 15

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing

11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	430	1	95	15	1140	0	0	1145	170
Number				3	8	18	5	2	12	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		1.00
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				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				467	1	0	16	1239	0	0	1245	185
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				566	1	507	216	2178	0	0	1915	285
Arrive On Green				0.32	0.32	0.00	0.43	0.43	0.00	0.00	0.43	0.43
Sat Flow, veh/h				1770	4	1583	373	5253	0	0	4639	664
Grp Volume(v), veh/h				468	0	0	16	1239	0	0	944	486
Grp Sat Flow(s),veh/h/ln				1774	0	1583	373	1695	0	0	1695	1745
Q Serve(g_s), s				12.7	0.0	0.0	1.8	9.6	0.0	0.0	11.5	11.5
Cycle Q Clear(g_c), s				12.7	0.0	0.0	13.3	9.6	0.0	0.0	11.5	11.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		0.38
Lane Grp Cap(c), veh/h				568	0	507	216	2178	0	0	1452	747
V/C Ratio(X)				0.82	0.00	0.00	0.07	0.57	0.00	0.00	0.65	0.65
Avail Cap(c_a), veh/h				798	0	712	225	2297	0	0	1532	789
HCM Platoon Ratio				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	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				16.3	0.0	0.0	17.1	11.2	0.0	0.0	11.8	11.8
Incr Delay (d2), s/veh				4.9	0.0	0.0	0.1	0.2	0.0	0.0	0.8	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(50%),veh/ln				6.9	0.0	0.0	0.2	4.5	0.0	0.0	5.4	5.7
LnGrp Delay(d),s/veh				21.3	0.0	0.0	17.2	11.5	0.0	0.0	12.6	13.3
LnGrp LOS				C			B	B			B	B
Approach Vol, veh/h					468			1255			1430	
Approach Delay, s/veh					21.3			11.5			12.8	
Approach LOS					C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		27.8				27.8		24.2				
Change Period (Y+Rc), s		5.5				5.5		7.6				
Max Green Setting (Gmax), s		23.5				23.5		23.4				
Max Q Clear Time (g_c+I1), s		15.3				13.5		14.7				
Green Ext Time (p_c), s		6.9				8.3		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay				13.6								
HCM 2010 LOS				B								

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↘	↑↑↑			↑↑↑	
Volume (vph)	0	0	0	430	1	95	15	1140	0	0	1145	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	75		0	0		0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Fr _t						0.850					0.981	
Fl _t Protected					0.952		0.950					
Satd. Flow (prot)	0	0	0	0	1773	1583	1770	5085	0	0	4989	0
Fl _t Permitted					0.952		0.190					
Satd. Flow (perm)	0	0	0	0	1773	1583	354	5085	0	0	4989	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		558			764			684			302	
Travel Time (s)		12.7			17.4			11.7			5.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	0	0	467	1	52	16	1239	0	0	1245	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	468	52	16	1239	0	0	1430	0
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Detector Phase				8	8	8	2	2			6	
Switch Phase												
Minimum Initial (s)				8.0	8.0	8.0	15.0	15.0			15.0	
Minimum Split (s)				15.6	15.6	15.6	20.5	20.5			20.5	
Total Split (s)				31.0	31.0	31.0	29.0	29.0			29.0	
Total Split (%)				51.7%	51.7%	51.7%	48.3%	48.3%			48.3%	
Yellow Time (s)				4.6	4.6	4.6	4.0	4.0			4.0	
All-Red Time (s)				3.0	3.0	3.0	1.5	1.5			1.5	
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)					7.6	7.6	5.5	5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode				None	None	None	Min	Min			Min	
Act Effct Green (s)					18.5	18.5	21.1	21.1			21.1	
Actuated g/C Ratio					0.35	0.35	0.40	0.40			0.40	
v/c Ratio					0.76	0.09	0.11	0.61			0.72	
Control Delay					24.4	12.3	14.1	14.8			16.5	
Queue Delay					0.0	0.0	0.0	0.0			0.0	
Total Delay					24.4	12.3	14.1	14.8			16.5	
LOS					C	B	B	B			B	
Approach Delay					23.1			14.8			16.5	
Approach LOS					C			B			B	
Queue Length 50th (ft)					135	11	3	115			141	
Queue Length 95th (ft)					229	30	15	168			204	

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

Lanes, Volumes, Timings

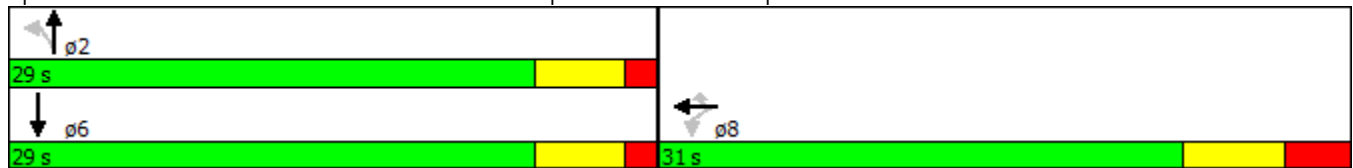


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		478			684			604				222
Turn Bay Length (ft)						75	75					
Base Capacity (vph)					803	717	161	2313				2270
Starvation Cap Reductn					0	0	0	0				0
Spillback Cap Reductn					0	0	0	0				0
Storage Cap Reductn					0	0	0	0				0
Reduced v/c Ratio					0.58	0.07	0.10	0.54				0.63

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	53
Natural Cycle:	40
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	16.9
Intersection LOS:	B
Intersection Capacity Utilization	77.8%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

HCM 2010 TWSC

Intersection

Int Delay, s/veh 26.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	125	1	5	0	0	0	0	955	250	45	1540	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	-	-	-	115	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	132	1	5	0	0	0	0	1005	263	47	1621	0

Major/Minor	Minor2			Major1			Major2					
Conflicting Flow All	2118	2984	811				1621	0	0	1268	0	0
Stage 1	1716	1716	-				-	-	-	-	-	-
Stage 2	402	1268	-				-	-	-	-	-	-
Critical Hdwy	5.74	6.54	7.14				5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	6.64	5.54	-				-	-	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-				-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92				3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	~ 81	14	277				194	-	-	290	-	-
Stage 1	~ 86	143	-				-	-	-	-	-	-
Stage 2	590	238	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 68	0	277				194	-	-	290	-	-
Mov Cap-2 Maneuver	~ 66	0	-				-	-	-	-	-	-
Stage 1	~ 72	0	-				-	-	-	-	-	-
Stage 2	590	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	\$ 582	0	0.6
HCM LOS	F		






















Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	194	-	-	66	277	290	-	-
HCM Lane V/C Ratio	-	-	-	2.01	0.019	0.163	-	-
HCM Control Delay (s)	0	-	-\$ 604.4	18.2	19.8	-	-	-
HCM Lane LOS	A	-	-	F	C	C	-	-
HCM 95th %tile Q(veh)	0	-	-	12.4	0.1	0.6	-	-

Notes

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

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Existing
 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			  	
Volume (vph)	125	1	5	0	0	0	0	955	250	45	1540	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	0		0	115		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850					0.969				
Flt Protected		0.953								0.950		
Satd. Flow (prot)	0	1775	1583	0	0	0	0	4928	0	1770	5085	0
Flt Permitted		0.953								0.950		
Satd. Flow (perm)	0	1775	1583	0	0	0	0	4928	0	1770	5085	0
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		555			481			673			684	
Travel Time (s)		12.6			10.9			11.5			11.7	
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
Adj. Flow (vph)	132	1	5	0	0	0	0	1005	263	47	1621	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	5	0	0	0	0	1268	0	47	1621	0
Sign Control		Stop			Free			Free			Free	
























Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	77.8%
Analysis Period (min)	15
	ICU Level of Service D

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

28: STH 36 & Drexel Ave
























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	160	215	145	50	215	55	140	630	65	35	520	155
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	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	176	236	80	55	236	60	154	692	36	38	571	85
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	337	610	518	370	469	119	393	1557	697	318	935	419
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.10	0.44	0.44	0.26	0.26	0.26
Sat Flow, veh/h	1079	1863	1583	1059	1434	365	1774	3539	1583	724	3539	1583
Grp Volume(v), veh/h	176	236	80	55	0	296	154	692	36	38	571	85
Grp Sat Flow(s),veh/h/ln	1079	1863	1583	1059	0	1798	1774	1770	1583	724	1770	1583
Q Serve(g_s), s	8.9	5.5	2.0	2.4	0.0	7.5	3.3	7.7	0.7	2.3	8.0	2.4
Cycle Q Clear(g_c), s	16.4	5.5	2.0	7.9	0.0	7.5	3.3	7.7	0.7	2.3	8.0	2.4
Prop In Lane	1.00		1.00	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	337	610	518	370	0	589	393	1557	697	318	935	419
V/C Ratio(X)	0.52	0.39	0.15	0.15	0.00	0.50	0.39	0.44	0.05	0.12	0.61	0.20
Avail Cap(c_a), veh/h	343	620	527	376	0	599	413	1740	778	348	1079	483
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	22.0	14.7	13.5	17.8	0.0	15.4	12.4	11.1	9.1	16.2	18.3	16.2
Incr Delay (d2), s/veh	0.6	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.0	0.2	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.8	0.9	0.7	0.0	3.7	1.6	3.8	0.3	0.5	4.0	1.1
LnGrp Delay(d),s/veh	22.6	14.8	13.6	17.8	0.0	15.6	12.7	11.3	9.1	16.4	19.1	16.5
LnGrp LOS	C	B	B	B		B	B	B	A	B	B	B
Approach Vol, veh/h		492			351			882			694	
Approach Delay, s/veh		17.4			16.0			11.4			18.6	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		31.1		25.7	10.0	21.1		25.7				
Change Period (Y+Rc), s		* 6.1		7.1	4.5	* 6.1		7.1				
Max Green Setting (Gmax), s		* 28		18.9	6.1	* 17		18.9				
Max Q Clear Time (g_c+I1), s		9.7		18.4	5.3	10.0		9.9				
Green Ext Time (p_c), s		8.3		0.2	0.0	4.5		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			15.4									
HCM 2010 LOS			B									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

28: STH 36 & Drexel Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	215	145	50	215	55	140	630	65	35	520	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		130	195		0	390		230	350		145
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.970				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1807	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.559			0.612			0.320			0.389		
Satd. Flow (perm)	1041	1863	1583	1140	1807	0	596	3539	1583	725	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		569			956			666			3068	
Travel Time (s)		11.1			18.6			10.1			46.5	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	176	236	80	55	236	60	154	692	36	38	571	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	176	236	80	55	296	0	154	692	36	38	571	85
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		6.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.1	23.1	23.1	23.1	23.1		10.5	22.1	22.1	22.1	22.1	22.1
Total Split (s)	26.0	26.0	26.0	26.0	26.0		10.6	34.0	34.0	23.4	23.4	23.4
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%		17.7%	56.7%	56.7%	39.0%	39.0%	39.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		1.0	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1		4.5	6.1	6.1	6.1	6.1	6.1
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	Min
Act Effect Green (s)	13.5	13.5	13.5	13.5	13.5		25.8	24.2	24.2	16.2	16.2	16.2
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26		0.50	0.47	0.47	0.32	0.32	0.32
v/c Ratio	0.64	0.48	0.19	0.18	0.62		0.35	0.41	0.05	0.17	0.51	0.17
Control Delay	29.8	20.4	16.7	17.1	23.9		9.8	10.0	8.3	17.5	17.7	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	20.4	16.7	17.1	23.9		9.8	10.0	8.3	17.5	17.7	16.1
LOS	C	C	B	B	C		A	B	A	B	B	B
Approach Delay		23.2			22.8			9.9			17.5	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)	48	62	19	13	81		21	62	5	9	75	19
Queue Length 95th (ft)	108	120	48	37	152		57	119	20	31	136	52

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

28: STH 36 & Drexel Ave

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		489			876			586			2988	
Turn Bay Length (ft)	130		130	195			390		230	350		145
Base Capacity (vph)	394	705	599	431	684		444	1977	884	251	1226	548
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.33	0.13	0.13	0.43		0.35	0.35	0.04	0.15	0.47	0.16

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	51.2
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	16.6
Intersection LOS:	B
Intersection Capacity Utilization:	75.4%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 28: STH 36 & Drexel Ave



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

HCM 2010 TWSC

Intersection												
Int Delay, s/veh	32.7											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	55	445	20	135	480	225	25	1	115	205	1	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	100	125	-	165	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	3	2	2	2	13	13	13
Mvmt Flow	60	484	22	147	522	245	27	1	125	223	1	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	522	0	0	484	0	0	1158	1418	242	1177	1418	261
Stage 1	-	-	-	-	-	-	603	603	-	815	815	-
Stage 2	-	-	-	-	-	-	555	815	-	362	603	-
Critical Hdwy	4.14	-	-	4.16	-	-	7.54	6.54	6.94	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.76	5.76	-
Follow-up Hdwy	2.22	-	-	2.23	-	-	3.52	4.02	3.32	3.63	4.13	3.43
Pot Cap-1 Maneuver	1041	-	-	1068	-	-	151	136	759	~ 134	123	705
Stage 1	-	-	-	-	-	-	453	487	-	315	364	-
Stage 2	-	-	-	-	-	-	484	389	-	600	460	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1041	-	-	1068	-	-	118	111	759	~ 95	100	705
Mov Cap-2 Maneuver	-	-	-	-	-	-	220	203	-	~ 185	182	-
Stage 1	-	-	-	-	-	-	427	459	-	297	314	-
Stage 2	-	-	-	-	-	-	381	335	-	471	433	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.4	14.7	206.2
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	522	1041	-	-	1068	-	-	219
HCM Lane V/C Ratio	0.294	0.057	-	-	0.137	-	-	1.295
HCM Control Delay (s)	14.7	8.7	-	-	8.9	-	-	206.2
HCM Lane LOS	B	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.2	0.2	-	-	0.5	-	-	15.1

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

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	445	20	135	480	225	25	1	115	205	1	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		100	125		165	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.890			0.971	
Flt Protected	0.950			0.950				0.991			0.962	
Satd. Flow (prot)	1770	3539	1583	1752	3505	1568	0	1643	0	0	1571	0
Flt Permitted	0.950			0.950				0.991			0.962	
Satd. Flow (perm)	1770	3539	1583	1752	3505	1568	0	1643	0	0	1571	0
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1015			447			386			310	
Travel Time (s)		17.3			7.6			7.5			6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	13%	13%	13%
Adj. Flow (vph)	60	484	22	147	522	245	27	1	125	223	1	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	484	22	147	522	245	0	153	0	0	284	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.2%
ICU Level of Service	A
Analysis Period (min)	15

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 24: STH 36 NB Off Ramp & Rawson Ave

HCM 2010 TWSC

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	720	0	0	1065	40	220
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	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	742	0	0	1098	41	227

Major/Minor

	Major1	Major2	Minor1
Conflicting Flow All	0	742	1291
Stage 1	-	-	742
Stage 2	-	-	549
Critical Hdwy	-	4.14	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	2.22	3.52
Pot Cap-1 Maneuver	-	861	155
Stage 1	-	-	432
Stage 2	-	-	542
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	861	155
Mov Cap-2 Maneuver	-	-	289
Stage 1	-	-	432
Stage 2	-	-	542

Approach

	EB	WB	NB
HCM Control Delay, s	0	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt

	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	531	-	-	861	-
HCM Lane V/C Ratio	0.505	-	-	-	-
HCM Control Delay (s)	18.5	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.8	-	-	0	-

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 24: STH 36 NB Off Ramp & Rawson Ave

Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	720	0	0	1065	40	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt					0.886	
Flt Protected					0.992	
Satd. Flow (prot)	3539	0	0	3539	1637	0
Flt Permitted					0.992	
Satd. Flow (perm)	3539	0	0	3539	1637	0
Link Speed (mph)	40			40	30	
Link Distance (ft)	954			755	294	
Travel Time (s)	16.3			12.9	6.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	742	0	0	1098	41	227
Shared Lane Traffic (%)						
Lane Group Flow (vph)	742	0	0	1098	268	0
Sign Control	Free			Free	Stop	

























Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9% ICU Level of Service A
Analysis Period (min)	15

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

6: 76th St & Rawson Ave

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	395	550	165	145	540	350	195	500	105	305	515	370
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	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	411	573	86	151	562	182	203	521	55	318	536	385
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	3	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	2	2	2	2	2	2
Cap, veh/h	462	1083	484	366	720	322	258	716	320	410	912	426
Arrive On Green	0.19	0.31	0.31	0.17	0.41	0.41	0.09	0.20	0.20	0.16	0.27	0.27
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	3539	1583	1774	3390	1583
Grp Volume(v), veh/h	411	573	86	151	562	182	203	521	55	318	536	385
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1770	1583	1774	1695	1583
Q Serve(g_s), s	15.9	12.1	3.6	5.9	12.4	8.0	8.0	12.4	2.6	12.2	12.4	21.1
Cycle Q Clear(g_c), s	15.9	12.1	3.6	5.9	12.4	8.0	8.0	12.4	2.6	12.2	12.4	21.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	462	1083	484	366	720	322	258	716	320	410	912	426
V/C Ratio(X)	0.89	0.53	0.18	0.41	0.78	0.57	0.79	0.73	0.17	0.78	0.59	0.90
Avail Cap(c_a), veh/h	462	1083	484	370	720	322	258	728	325	410	923	431
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	25.9	22.9	22.5	25.0	23.6	27.6	33.6	29.7	22.9	28.6	31.8
Incr Delay (d2), s/veh	18.9	1.9	0.8	0.7	7.5	6.4	14.8	3.6	0.3	9.1	1.0	22.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	6.2	1.7	3.0	6.7	4.0	2.2	6.4	1.1	6.9	5.9	11.8
LnGrp Delay(d),s/veh	41.0	27.7	23.7	23.2	32.5	30.0	42.4	37.2	29.9	31.9	29.5	53.8
LnGrp LOS	D	C	C	C	C	C	D	D	C	C	C	D
Approach Vol, veh/h		1070			895			779			1239	
Approach Delay, s/veh		32.5			30.4			38.0			37.7	
Approach LOS		C			C			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	19.0	24.7	12.8	33.5	13.0	30.7	22.0	24.3				
Change Period (Y+Rc), s	5.0	6.5	5.0	6.0	5.0	6.5	5.0	6.0				
Max Green Setting (Gmax), s	14.0	18.5	8.0	27.0	8.0	24.5	17.0	18.0				
Max Q Clear Time (g_c+I1), s	14.2	14.4	7.9	14.1	10.0	23.1	17.9	14.4				
Green Ext Time (p_c), s	0.0	3.0	0.0	6.5	0.0	1.1	0.0	2.4				
Intersection Summary												
HCM 2010 Ctrl Delay			34.7									
HCM 2010 LOS			C									

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

6: 76th St & Rawson Ave

Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	395	550	165	145	540	350	195	500	105	305	515	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		165	50		125	150		0	100		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.937	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	4765	0
Flt Permitted	0.197			0.436			0.239			0.224		
Satd. Flow (perm)	367	3539	1583	812	3539	1583	445	3539	1583	417	4765	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		755			2655			785			673	
Travel Time (s)		12.9			45.3			13.4			11.5	
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
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	411	573	86	151	562	182	203	521	55	318	536	385
Shared Lane Traffic (%)												
Lane Group Flow (vph)	411	573	86	151	562	182	203	521	55	318	921	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	15.0	15.0	7.0	15.0	
Minimum Split (s)	12.0	21.0	21.0	12.0	21.0	21.0	12.0	21.5	21.5	12.0	21.5	
Total Split (s)	22.0	33.0	33.0	13.0	24.0	24.0	13.0	25.0	25.0	19.0	31.0	
Total Split (%)	24.4%	36.7%	36.7%	14.4%	26.7%	26.7%	14.4%	27.8%	27.8%	21.1%	34.4%	
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	2.5	2.5	1.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	Min	Min	None	Min	
Act Effect Green (s)	42.3	28.4	28.4	27.6	18.7	18.7	27.2	17.5	17.5	37.3	22.9	
Actuated g/C Ratio	0.47	0.32	0.32	0.31	0.21	0.21	0.30	0.19	0.19	0.41	0.25	
v/c Ratio	0.92	0.51	0.17	0.45	0.77	0.55	0.80	0.76	0.18	0.84	0.96dr	
Control Delay	48.4	27.5	24.3	17.3	34.4	31.2	43.5	42.1	31.5	39.9	35.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.4	27.5	24.3	17.3	34.4	31.2	43.5	42.1	31.5	39.9	35.4	
LOS	D	C	C	B	C	C	D	D	C	D	D	
Approach Delay		35.3			30.8			41.7			36.5	
Approach LOS		D			C			D			D	
Queue Length 50th (ft)	169	142	36	24	162	96	72	146	26	121	172	
Queue Length 95th (ft)	#353	194	72	52	#181	113	#162	202	59	#238	219	

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 6: 76th St & Rawson Ave

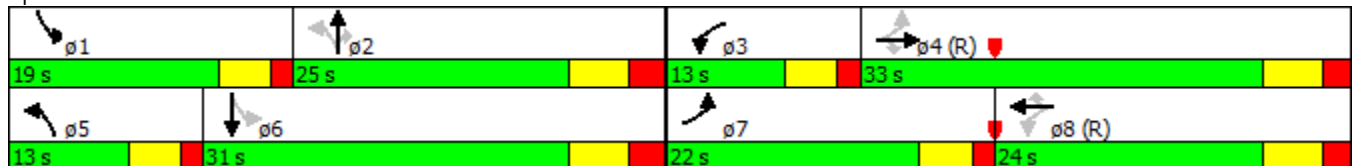
Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		675			2575			705			593	
Turn Bay Length (ft)	75		165	50		125	150			100		
Base Capacity (vph)	448	1117	499	336	733	328	255	727	325	385	1297	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.51	0.17	0.45	0.77	0.55	0.80	0.72	0.17	0.83	0.71	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 37 (41%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 35.9
 Intersection LOS: D
 Intersection Capacity Utilization 86.3%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.























Splits and Phases: 6: 76th St & Rawson Ave



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

3: 68th St & Rawson Ave























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	990	65	45	1040	35	40	45	50	30	50	25
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	1863	1900	1863	1863	1900	1827	1827
Adj Flow Rate, veh/h	37	1042	34	47	1095	18	42	47	26	32	53	13
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	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	2	2	2	4	4	4
Cap, veh/h	386	2150	962	379	2174	972	59	46	246	55	65	242
Arrive On Green	0.03	0.41	0.41	0.05	0.61	0.61	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	0	294	1583	0	416	1553
Grp Volume(v), veh/h	37	1042	34	47	1095	18	89	0	26	85	0	13
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	294	0	1583	416	0	1553
Q Serve(g_s), s	0.7	19.6	1.2	0.8	15.6	0.4	0.0	0.0	1.3	0.0	0.0	0.6
Cycle Q Clear(g_c), s	0.7	19.6	1.2	0.8	15.6	0.4	14.0	0.0	1.3	14.0	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	0.47		1.00	0.38		1.00
Lane Grp Cap(c), veh/h	386	2150	962	379	2174	972	105	0	246	120	0	242
V/C Ratio(X)	0.10	0.48	0.04	0.12	0.50	0.02	0.85	0.00	0.11	0.71	0.00	0.05
Avail Cap(c_a), veh/h	470	2150	962	471	2174	972	105	0	246	120	0	242
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	0.77	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.9	16.3	10.8	7.6	9.7	6.8	38.4	0.0	32.6	35.5	0.0	32.4
Incr Delay (d2), s/veh	0.1	0.6	0.1	0.1	0.8	0.0	44.9	0.0	0.2	17.6	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	9.7	0.5	0.4	7.7	0.2	3.5	0.0	0.6	2.7	0.0	0.3
LnGrp Delay(d),s/veh	7.0	16.9	10.9	7.8	10.5	6.8	83.2	0.0	32.8	53.1	0.0	32.5
LnGrp LOS	A	B	B	A	B	A	F		C	D		C
Approach Vol, veh/h		1113			1160			115			98	
Approach Delay, s/veh		16.4			10.4			71.8			50.4	
Approach LOS		B			B			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.3	60.7		20.0	8.7	61.3				
Change Period (Y+Rc), s		6.0	4.5	6.0		6.0	4.5	6.0				
Max Green Setting (Gmax), s		14.0	9.5	50.0		14.0	8.5	51.0				
Max Q Clear Time (g_c+I1), s		16.0	2.8	21.6		16.0	2.7	17.6				
Green Ext Time (p_c), s		0.0	0.0	18.4		0.0	0.0	20.4				
Intersection Summary												
HCM 2010 Ctrl Delay			17.5									
HCM 2010 LOS			B									

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

3: 68th St & Rawson Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	990	65	45	1040	35	40	45	50	30	50	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	205		115	200		125	0		100	0		100
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.977			0.982	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1820	1583	0	1794	1553
Flt Permitted	0.225			0.241				0.807			0.838	
Satd. Flow (perm)	419	3539	1583	449	3539	1583	0	1503	1583	0	1531	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		2655			544			394			1251	
Travel Time (s)		45.3			9.3			9.0			28.4	
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
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	37	1042	34	47	1095	18	42	47	26	32	53	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	1042	34	47	1095	18	0	89	26	0	85	13
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	21.0	21.0	11.5	21.0	21.0	16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	13.0	56.0	56.0	14.0	57.0	57.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	14.4%	62.2%	62.2%	15.6%	63.3%	63.3%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effect Green (s)	68.4	63.9	63.9	68.4	63.9	63.9		11.6	11.6		11.6	11.6
Actuated g/C Ratio	0.76	0.71	0.71	0.76	0.71	0.71		0.13	0.13		0.13	0.13
v/c Ratio	0.09	0.41	0.03	0.11	0.44	0.02		0.46	0.13		0.43	0.07
Control Delay	2.6	5.8	4.7	3.8	8.8	7.6		43.8	35.2		42.7	33.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	2.6	5.8	4.7	3.8	8.8	7.6		43.8	35.2		42.7	33.8
LOS	A	A	A	A	A	A		D	D		D	C
Approach Delay		5.7			8.6			41.8			41.5	
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	3	83	5	5	163	4		48	14		46	7

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

3: 68th St & Rawson Ave

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	m5	200	m6	15	243	13		91	36		87	23
Internal Link Dist (ft)		2575			464			314			1171	
Turn Bay Length (ft)	205		115	200		125			100			100
Base Capacity (vph)	450	2512	1124	488	2512	1124		236	249		241	244
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.08	0.41	0.03	0.10	0.44	0.02		0.38	0.10		0.35	0.05

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 10.1

Intersection LOS: B

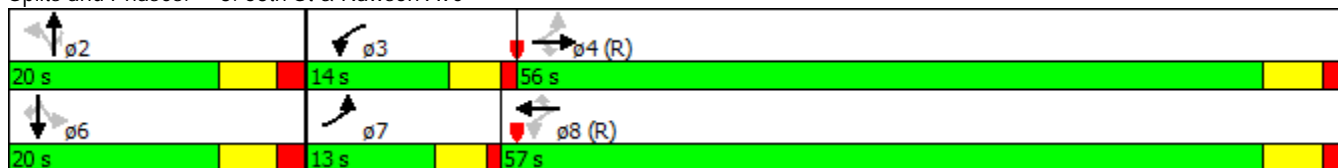
Intersection Capacity Utilization 60.4%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: 68th St & Rawson Ave



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

HCM 2010 TWSC

Intersection

Int Delay, s/veh 29.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	120	1	165	5	1	5	170	1050	5	1	905	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	100	-	100
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	10	10	10	2	2	2	2	2	2
Mvmt Flow	128	1	176	5	1	5	181	1117	5	1	963	64

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1774	2449	481	1965	2446	561	963	0	0	1122	0	0
Stage 1	965	965	-	1481	1481	-	-	-	-	-	-	-
Stage 2	809	1484	-	484	965	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	6.94	7.15	6.7	7.3	4.14	-	-	5.34	-	-
Critical Hdwy Stg 1	6.54	5.54	-	7.5	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.7	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.32	3.75	4.1	4	2.22	-	-	3.12	-	-
Pot Cap-1 Maneuver	~ 68	31	531	46	27	388	711	-	-	342	-	-
Stage 1	267	331	-	86	174	-	-	-	-	-	-	-
Stage 2	317	187	-	497	314	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 53	23	531	24	20	388	711	-	-	342	-	-
Mov Cap-2 Maneuver	~ 121	97	-	50	69	-	-	-	-	-	-	-
Stage 1	199	330	-	64	130	-	-	-	-	-	-	-
Stage 2	231	139	-	331	313	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	245.8	53.3	1.6	0
HCM LOS	F	F		





















Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	711	-	-	218	86	342	-	-
HCM Lane V/C Ratio	0.254	-	-	1.396	0.136	0.003	-	-
HCM Control Delay (s)	11.8	-	-	245.8	53.3	15.6	-	-
HCM Lane LOS	B	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	1	-	-	17.4	0.5	0	-	-

Notes

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

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1	165	5	1	5	170	1050	5	1	905	60
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	125		0	100		100
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Frt		0.922			0.939			0.999				0.850
Flt Protected		0.979			0.978		0.950			0.950		
Satd. Flow (prot)	0	1681	0	0	1586	0	1770	5080	0	1770	3539	1583
Flt Permitted		0.979			0.978		0.950			0.950		
Satd. Flow (perm)	0	1681	0	0	1586	0	1770	5080	0	1770	3539	1583
Link Speed (mph)		35			35			40				40
Link Distance (ft)		558			782			302				707
Travel Time (s)		10.9			15.2			5.1				12.1
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 (%)	2%	2%	2%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	128	1	176	5	1	5	181	1117	5	1	963	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	305	0	0	11	0	181	1122	0	1	963	64
Sign Control		Stop			Stop			Free			Free	



















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.2%
ICU Level of Service	C
Analysis Period (min)	15

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	285	1	85	5	1135	0	0	955	155
Number				3	8	18	5	2	12	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		1.00
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				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				294	1	0	5	1170	0	0	985	160
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
Peak Hour Factor				0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				404	1	361	320	2352	0	0	2041	331
Arrive On Green				0.23	0.23	0.00	0.46	0.46	0.00	0.00	0.46	0.46
Sat Flow, veh/h				1768	6	1583	489	5253	0	0	4580	715
Grp Volume(v), veh/h				295	0	0	5	1170	0	0	756	389
Grp Sat Flow(s),veh/h/ln				1774	0	1583	489	1695	0	0	1695	1737
Q Serve(g_s), s				6.5	0.0	0.0	0.3	6.8	0.0	0.0	6.5	6.6
Cycle Q Clear(g_c), s				6.5	0.0	0.0	6.9	6.8	0.0	0.0	6.5	6.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		0.41
Lane Grp Cap(c), veh/h				405	0	361	320	2352	0	0	1568	803
V/C Ratio(X)				0.73	0.00	0.00	0.02	0.50	0.00	0.00	0.48	0.48
Avail Cap(c_a), veh/h				938	0	837	377	2941	0	0	1961	1004
HCM Platoon Ratio				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	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.1	0.0	0.0	10.3	7.9	0.0	0.0	7.9	7.9
Incr Delay (d2), s/veh				2.5	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.5	0.0	0.0	0.0	3.2	0.0	0.0	3.1	3.2
LnGrp Delay(d),s/veh				17.7	0.0	0.0	10.3	8.1	0.0	0.0	8.0	8.2
LnGrp LOS				B			B	A			A	A
Approach Vol, veh/h					295			1175			1145	
Approach Delay, s/veh					17.7			8.1			8.1	
Approach LOS					B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		25.1				25.1		17.3				
Change Period (Y+Rc), s		5.5				5.5		7.6				
Max Green Setting (Gmax), s		24.5				24.5		22.4				
Max Q Clear Time (g_c+I1), s		8.9				8.6		8.5				
Green Ext Time (p_c), s		10.7				10.9		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay				9.2								
HCM 2010 LOS				A								

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing

11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↷	↶	↶↶↶			↶↶↶	
Volume (vph)	0	0	0	285	1	85	5	1135	0	0	955	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	75		0	0		0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt						0.850					0.979	
Flt Protected					0.953		0.950					
Satd. Flow (prot)	0	0	0	0	1775	1583	1770	5085	0	0	4979	0
Flt Permitted					0.953		0.219					
Satd. Flow (perm)	0	0	0	0	1775	1583	408	5085	0	0	4979	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		558			764			684			302	
Travel Time (s)		12.7			17.4			11.7			5.1	
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
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	0	0	294	1	44	5	1170	0	0	985	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	295	44	5	1170	0	0	1145	0
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Detector Phase				8	8	8	2	2			6	
Switch Phase												
Minimum Initial (s)				8.0	8.0	8.0	15.0	15.0			15.0	
Minimum Split (s)				23.6	23.6	23.6	21.5	21.5			21.5	
Total Split (s)				30.0	30.0	30.0	30.0	30.0			30.0	
Total Split (%)				50.0%	50.0%	50.0%	50.0%	50.0%			50.0%	
Yellow Time (s)				4.6	4.6	4.6	4.0	4.0			4.0	
All-Red Time (s)				3.0	3.0	3.0	1.5	1.5			1.5	
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)					7.6	7.6	5.5	5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode				None	None	None	Min	Min			Min	
Act Effect Green (s)					13.0	13.0	18.3	18.3			18.3	
Actuated g/C Ratio					0.29	0.29	0.41	0.41			0.41	
v/c Ratio					0.57	0.10	0.03	0.56			0.56	
Control Delay					18.7	12.6	10.0	11.9			11.9	
Queue Delay					0.0	0.0	0.0	0.0			0.0	
Total Delay					18.7	12.6	10.0	11.9			11.9	
LOS					B	B	A	B			B	
Approach Delay					17.9			11.9			11.9	
Approach LOS					B			B			B	
Queue Length 50th (ft)					58	7	1	75			73	
Queue Length 95th (ft)					138	28	7	143			141	

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

Lanes, Volumes, Timings

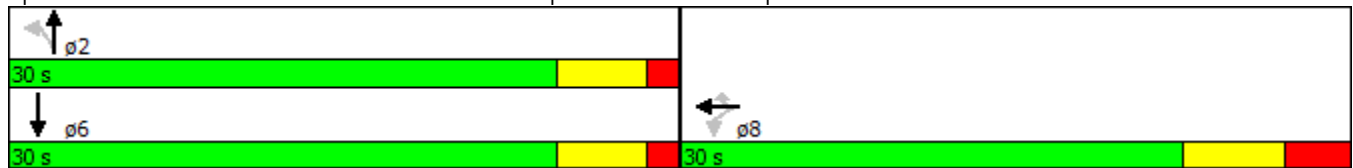


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		478			684			604			222	
Turn Bay Length (ft)						75	75					
Base Capacity (vph)					914	815	230	2866			2806	
Starvation Cap Reductn					0	0	0	0			0	
Spillback Cap Reductn					0	0	0	0			0	
Storage Cap Reductn					0	0	0	0			0	
Reduced v/c Ratio					0.32	0.05	0.02	0.41			0.41	

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	44.8
Natural Cycle:	50
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.57
Intersection Signal Delay:	12.6
Intersection LOS:	B
Intersection Capacity Utilization:	65.7%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

HCM 2010 TWSC

Intersection

Int Delay, s/veh 41.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	200	1	5	0	0	0	0	875	265	75	1155	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	-	-	-	115	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	204	1	5	0	0	0	0	893	270	77	1179	0

Major/Minor	Minor2			Major1			Major2					
Conflicting Flow All	1689	2495	589				1179	0	0	1163	0	0
Stage 1	1332	1332	-				-	-	-	-	-	-
Stage 2	357	1163	-				-	-	-	-	-	-
Critical Hdwy	5.74	6.54	7.14				5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	6.64	5.54	-				-	-	-	-	-	-
Critical Hdwy Stg 2	6.04	5.54	-				-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92				3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	~ 137	29	387				320	-	-	326	-	-
Stage 1	~ 151	222	-				-	-	-	-	-	-
Stage 2	622	267	-				-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 105	0	387				320	-	-	326	-	-
Mov Cap-2 Maneuver	~ 105	0	-				-	-	-	-	-	-
Stage 1	~ 115	0	-				-	-	-	-	-	-
Stage 2	622	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	\$ 517.2	0	1.2
HCM LOS	F		






















Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	320	-	-	105	387	326	-	-
HCM Lane V/C Ratio	-	-	-	1.953	0.013	0.235	-	-
HCM Control Delay (s)	0	-	-	\$ 529.7	14.4	19.4	-	-
HCM Lane LOS	A	-	-	F	B	C	-	-
HCM 95th %tile Q(veh)	0	-	-	17	0	0.9	-	-

Notes

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

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Existing
 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			  	
Volume (vph)	200	1	5	0	0	0	0	875	265	75	1155	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	0		0	115		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850					0.965				
Flt Protected		0.953								0.950		
Satd. Flow (prot)	0	1775	1583	0	0	0	0	4907	0	1770	5085	0
Flt Permitted		0.953								0.950		
Satd. Flow (perm)	0	1775	1583	0	0	0	0	4907	0	1770	5085	0
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		555			480			673			684	
Travel Time (s)		12.6			10.9			11.5			11.7	
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
Adj. Flow (vph)	204	1	5	0	0	0	0	893	270	77	1179	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	205	5	0	0	0	0	1163	0	77	1179	0
Sign Control		Stop			Free			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.7%
Analysis Period (min)	15
	ICU Level of Service C
























Appendix 2

Design Year (Year 2032) Traffic Operational Analysis
With Traffic Signal Control

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal

28: STH 36 & Drexel Ave
























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	135	270	135	110	260	30	140	630	60	60	1135	190
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	1845	1845	1845	1863	1863	1863
Adj Flow Rate, veh/h	145	290	73	118	280	32	151	677	32	65	1220	102
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	3	3	3	2	2	2
Cap, veh/h	227	470	400	238	415	47	292	1835	821	383	1254	561
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.09	0.52	0.52	0.35	0.35	0.35
Sat Flow, veh/h	1063	1863	1583	1015	1642	188	1757	3505	1568	737	3539	1583
Grp Volume(v), veh/h	145	290	73	118	0	312	151	677	32	65	1220	102
Grp Sat Flow(s),veh/h/ln	1063	1863	1583	1015	0	1830	1757	1752	1568	737	1770	1583
Q Serve(g_s), s	5.8	8.1	2.1	6.8	0.0	9.1	2.9	6.7	0.6	3.7	20.0	2.6
Cycle Q Clear(g_c), s	14.9	8.1	2.1	14.9	0.0	9.1	2.9	6.7	0.6	3.7	20.0	2.6
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	470	400	238	0	462	292	1835	821	383	1254	561
V/C Ratio(X)	0.64	0.62	0.18	0.49	0.00	0.68	0.52	0.37	0.04	0.17	0.97	0.18
Avail Cap(c_a), veh/h	227	470	400	238	0	462	322	1895	848	383	1254	561
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	27.4	19.5	17.3	26.2	0.0	19.9	13.1	8.3	6.8	13.5	18.8	13.1
Incr Delay (d2), s/veh	4.5	1.8	0.1	0.6	0.0	3.2	0.5	0.1	0.0	0.2	19.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.4	0.9	1.9	0.0	4.9	1.4	3.2	0.3	0.8	13.0	1.2
LnGrp Delay(d),s/veh	31.9	21.3	17.4	26.7	0.0	23.1	13.6	8.4	6.9	13.7	38.0	13.3
LnGrp LOS	C	C	B	C		C	B	A	A	B	D	B
Approach Vol, veh/h		508			430			860			1387	
Approach Delay, s/veh		23.8			24.1			9.3			35.0	
Approach LOS		C			C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		37.0		22.0	10.0	27.0		22.0				
Change Period (Y+Rc), s		* 6.1		7.1	4.5	* 6.1		7.1				
Max Green Setting (Gmax), s		* 32		14.9	6.5	* 21		14.9				
Max Q Clear Time (g_c+I1), s		8.7		16.9	4.9	22.0		16.9				
Green Ext Time (p_c), s		14.7		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			24.8									
HCM 2010 LOS			C									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal

28: STH 36 & Drexel Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	270	135	110	260	30	140	630	60	60	1135	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		130	195		0	390		230	350		145
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.985				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1835	0	1752	3505	1568	1770	3539	1583
Flt Permitted	0.479			0.524			0.156			0.394		
Satd. Flow (perm)	892	1863	1583	976	1835	0	288	3505	1568	734	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		569			956			666			3068	
Travel Time (s)		11.1			18.6			10.1			46.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	145	290	73	118	280	32	151	677	32	65	1220	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	145	290	73	118	312	0	151	677	32	65	1220	102
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2				6
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		6.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.1	23.1	23.1	23.1	23.1		10.5	22.1	22.1	22.1	22.1	22.1
Total Split (s)	22.0	22.0	22.0	22.0	22.0		11.0	38.0	38.0	27.0	27.0	27.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%		18.3%	63.3%	63.3%	45.0%	45.0%	45.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		1.0	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1		4.5	6.1	6.1	6.1	6.1	6.1
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	Min
Act Effect Green (s)	13.0	13.0	13.0	13.0	13.0		31.2	29.5	29.5	21.2	21.2	21.2
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23		0.56	0.53	0.53	0.38	0.38	0.38
v/c Ratio	0.70	0.67	0.20	0.52	0.73		0.46	0.37	0.04	0.23	0.91	0.17
Control Delay	41.8	28.8	19.7	29.1	32.4		10.9	8.5	6.8	16.7	31.0	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	28.8	19.7	29.1	32.4		10.9	8.5	6.8	16.7	31.0	14.4
LOS	D	C	B	C	C		B	A	A	B	C	B
Approach Delay		31.2			31.5			8.8			29.1	
Approach LOS		C			C			A			C	
Queue Length 50th (ft)	47	93	21	37	102		23	65	5	16	218	24

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal

28: STH 36 & Drexel Ave

Lanes, Volumes, Timings

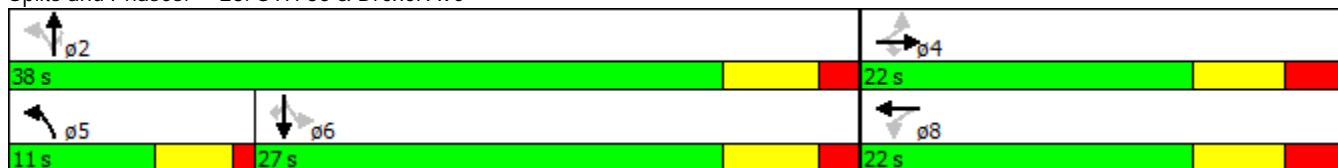


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	#122	164	50	82	#199		47	98	15	44	#361	55
Internal Link Dist (ft)		489			876			586			2988	
Turn Bay Length (ft)	130		130	195			390		230	350		145
Base Capacity (vph)	241	503	427	263	495		333	2027	907	278	1341	600
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.58	0.17	0.45	0.63		0.45	0.33	0.04	0.23	0.91	0.17

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 55.9
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 24.3
 Intersection LOS: C
 Intersection Capacity Utilization 83.6%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.






















Splits and Phases: 28: STH 36 & Drexel Ave



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal






















18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	550	20	145	775	290	25	1	105	155	1	45
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	1845	1845	1845	1863	1863	1863	1900	1863	1900	1900	1557	1900
Adj Flow Rate, veh/h	61	561	10	148	791	148	26	1	107	158	1	46
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	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, %	3	3	3	2	2	2	2	2	2	22	22	22
Cap, veh/h	376	1842	824	511	1860	832	127	36	299	334	15	64
Arrive On Green	0.53	0.53	0.53	0.53	0.53	0.53	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	588	3505	1568	838	3539	1583	170	158	1303	890	67	277
Grp Volume(v), veh/h	61	561	10	148	791	148	134	0	0	205	0	0
Grp Sat Flow(s),veh/h/ln	588	1752	1568	838	1770	1583	1631	0	0	1234	0	0
Q Serve(g_s), s	3.5	4.4	0.1	5.9	6.7	2.4	0.0	0.0	0.0	3.7	0.0	0.0
Cycle Q Clear(g_c), s	10.2	4.4	0.1	10.4	6.7	2.4	3.4	0.0	0.0	7.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.19		0.80	0.77		0.22
Lane Grp Cap(c), veh/h	376	1842	824	511	1860	832	462	0	0	413	0	0
V/C Ratio(X)	0.16	0.30	0.01	0.29	0.43	0.18	0.29	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	559	2934	1312	772	2962	1325	1269	0	0	1002	0	0
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	0.00
Uniform Delay (d), s/veh	10.2	6.6	5.6	9.5	7.1	6.1	15.8	0.0	0.0	17.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.1	0.0	0.3	0.2	0.1	0.3	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.1	0.1	1.4	3.2	1.1	1.6	0.0	0.0	2.6	0.0	0.0
LnGrp Delay(d),s/veh	10.4	6.7	5.6	9.8	7.3	6.2	16.2	0.0	0.0	17.9	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	B			B		
Approach Vol, veh/h		632			1087			134			205	
Approach Delay, s/veh		7.0			7.5			16.2			17.9	
Approach LOS		A			A			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		17.2		31.7		17.2		31.7				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		37.0		41.0		37.0		41.0				
Max Q Clear Time (g_c+I1), s		5.4		12.2		9.1		12.4				
Green Ext Time (p_c), s		2.2		13.4		2.2		13.4				
Intersection Summary												
HCM 2010 Ctrl Delay			8.9									
HCM 2010 LOS			A									

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	550	20	145	775	290	25	1	105	155	1	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		100	125		165	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.892				0.970
Flt Protected	0.950			0.950				0.990				0.963
Satd. Flow (prot)	1752	3505	1568	1770	3539	1583	0	1645	0	0	1455	0
Flt Permitted	0.310			0.442				0.912				0.689
Satd. Flow (perm)	572	3505	1568	823	3539	1583	0	1515	0	0	1041	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35				35
Link Distance (ft)		1015			447			386				310
Travel Time (s)		17.3			7.6			7.5				6.0
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
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	22%	22%	22%
Adj. Flow (vph)	61	561	10	148	791	148	26	1	107	158	1	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	561	10	148	791	148	0	134	0	0	205	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	18.0	18.0	18.0	18.0	18.0	18.0	16.0	16.0		16.0	16.0	
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	43.0	43.0		43.0	43.0	
Total Split (%)	52.2%	52.2%	52.2%	52.2%	52.2%	52.2%	47.8%	47.8%		47.8%	47.8%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		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)	6.0	6.0	6.0	6.0	6.0	6.0		6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Min	Min		Min	Min	
Act Effect Green (s)	20.7	20.7	20.7	20.7	20.7	20.7		16.2			16.2	
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41		0.32			0.32	
v/c Ratio	0.26	0.39	0.02	0.43	0.54	0.23		0.27			0.61	
Control Delay	13.9	11.3	9.9	16.1	12.8	11.2		15.6			24.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	13.9	11.3	9.9	16.1	12.8	11.2		15.6			24.3	
LOS	B	B	A	B	B	B		B			C	
Approach Delay		11.5			13.0			15.6			24.3	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	10	50	2	26	76	23		25			44	

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

Lanes, Volumes, Timings

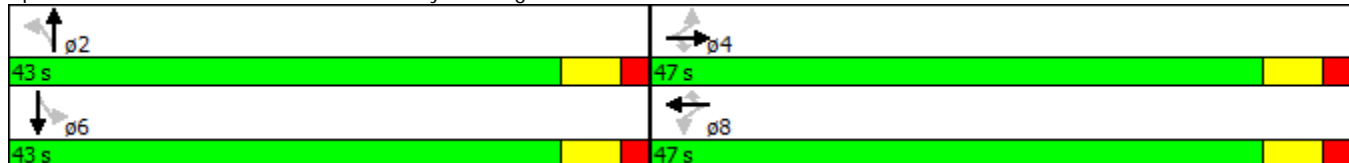


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	42	119	10	90	175	74		82			140	
Internal Link Dist (ft)		935			367			306			230	
Turn Bay Length (ft)	130		100	125		165						
Base Capacity (vph)	479	2937	1314	690	2966	1326		1187			816	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.13	0.19	0.01	0.21	0.27	0.11		0.11			0.25	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	49.9
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.61
Intersection Signal Delay:	13.8
Intersection LOS:	B
Intersection Capacity Utilization:	64.5%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 24: STH 36 NB Off Ramp & Rawson Ave

HCM 2010 TWSC

Intersection

Int Delay, s/veh 2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	765	0	0	1505	40	245
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	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	814	0	0	1601	43	261

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	814
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	809
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	809
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	25
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	475	-	-	809	-
HCM Lane V/C Ratio	0.638	-	-	-	-
HCM Control Delay (s)	25	-	-	0	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	4.4	-	-	0	-

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 24: STH 36 NB Off Ramp & Rawson Ave

Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (vph)	765	0	0	1505	40	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt					0.884	
Flt Protected					0.993	
Satd. Flow (prot)	3539	0	0	3539	1588	0
Flt Permitted					0.993	
Satd. Flow (perm)	3539	0	0	3539	1588	0
Link Speed (mph)	40			40	30	
Link Distance (ft)	954			755	294	
Travel Time (s)	16.3			12.9	6.7	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	814	0	0	1601	43	261
Shared Lane Traffic (%)						
Lane Group Flow (vph)	814	0	0	1601	304	0
Sign Control	Free			Free	Stop	

























Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.6%
Analysis Period (min)	15
	ICU Level of Service C

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal

6: 76th St & Rawson Ave






























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	360	555	150	160	950	435	175	515	80	395	730	400
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	1845	1845	1845	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	375	578	78	167	990	227	182	536	42	411	760	417
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	3	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, %	3	3	3	2	2	2	2	2	2	2	2	2
Cap, veh/h	334	1131	506	383	944	422	218	688	308	378	885	413
Arrive On Green	0.14	0.32	0.32	0.09	0.27	0.27	0.08	0.19	0.19	0.05	0.09	0.09
Sat Flow, veh/h	1757	3505	1568	1774	3539	1583	1774	3539	1583	1774	3390	1583
Grp Volume(v), veh/h	375	578	78	167	990	227	182	536	42	411	760	417
Grp Sat Flow(s),veh/h/ln	1757	1752	1568	1774	1770	1583	1774	1770	1583	1774	1695	1583
Q Serve(g_s), s	13.0	12.0	3.2	6.0	24.0	11.0	7.0	12.9	2.0	13.0	19.9	23.5
Cycle Q Clear(g_c), s	13.0	12.0	3.2	6.0	24.0	11.0	7.0	12.9	2.0	13.0	19.9	23.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	334	1131	506	383	944	422	218	688	308	378	885	413
V/C Ratio(X)	1.12	0.51	0.15	0.44	1.05	0.54	0.83	0.78	0.14	1.09	0.86	1.01
Avail Cap(c_a), veh/h	334	1131	506	404	944	422	218	688	308	378	885	413
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.68	1.00	1.00	1.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	24.7	24.7	21.7	21.0	33.0	28.3	29.1	34.4	30.0	29.3	39.5	41.1
Incr Delay (d2), s/veh	87.0	0.4	0.1	0.5	38.1	0.9	23.5	8.5	0.9	69.1	9.7	44.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.3	5.8	1.4	3.0	16.7	4.9	2.5	7.1	0.9	10.3	10.5	15.4
LnGrp Delay(d),s/veh	111.7	25.1	21.9	21.5	71.1	29.2	52.6	42.9	30.9	98.3	49.1	85.3
LnGrp LOS	F	C	C	C	F	C	D	D	C	F	D	F
Approach Vol, veh/h		1031			1384			760			1588	
Approach Delay, s/veh		56.3			58.2			44.6			71.4	
Approach LOS		E			E			D			E	
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	18.0	24.0	12.9	35.1	12.0	30.0	18.0	30.0				
Change Period (Y+Rc), s	5.0	6.5	5.0	6.0	5.0	6.5	5.0	6.0				
Max Green Setting (Gmax), s	13.0	17.5	9.0	28.0	7.0	23.5	13.0	24.0				
Max Q Clear Time (g_c+I1), s	15.0	14.9	8.0	14.0	9.0	25.5	15.0	26.0				
Green Ext Time (p_c), s	0.0	2.1	0.0	9.1	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			60.0									
HCM 2010 LOS			E									

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal

6: 76th St & Rawson Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			  	
Volume (vph)	360	555	150	160	950	435	175	515	80	395	730	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		165	50		125	150		0	100		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.947	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3505	1568	1770	3539	1583	1770	3539	1583	1770	4816	0
Flt Permitted	0.141			0.396			0.229			0.212		
Satd. Flow (perm)	260	3505	1568	738	3539	1583	427	3539	1583	395	4816	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		755			2655			785			673	
Travel Time (s)		12.9			45.3			13.4			11.5	
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
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	375	578	78	167	990	227	182	536	42	411	760	417
Shared Lane Traffic (%)												
Lane Group Flow (vph)	375	578	78	167	990	227	182	536	42	411	1177	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	15.0	15.0	7.0	15.0	
Minimum Split (s)	12.0	21.0	21.0	12.0	21.0	21.0	12.0	21.5	21.5	12.0	21.5	
Total Split (s)	18.0	34.0	34.0	14.0	30.0	30.0	12.0	24.0	24.0	18.0	30.0	
Total Split (%)	20.0%	37.8%	37.8%	15.6%	33.3%	33.3%	13.3%	26.7%	26.7%	20.0%	33.3%	
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	2.5	2.5	1.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min	
Act Effect Green (s)	42.2	28.4	28.4	33.6	24.0	24.0	26.0	17.5	17.5	37.0	23.5	
Actuated g/C Ratio	0.47	0.32	0.32	0.37	0.27	0.27	0.29	0.19	0.19	0.41	0.26	
v/c Ratio	1.11	0.52	0.16	0.45	1.05	0.54	0.80	0.78	0.14	1.14	1.01dr	
Control Delay	107.9	27.5	23.6	18.3	76.8	33.8	47.5	43.5	31.4	110.8	39.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	107.9	27.5	23.6	18.3	76.8	33.8	47.5	43.5	31.4	110.8	39.3	
LOS	F	C	C	B	E	C	D	D	C	F	D	
Approach Delay		56.4			62.7			43.8			57.8	
Approach LOS		E			E			D			E	
Queue Length 50th (ft)	-196	141	32	52	-325	110	66	153	20	-207	253	

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 6: 76th St & Rawson Ave

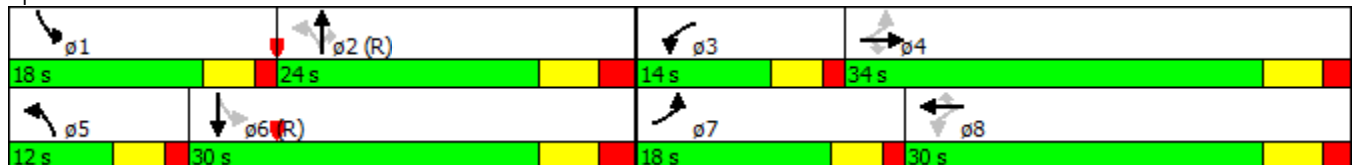
Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	#370	193	66	91	#448	184	#153	#215	48	#376	#315	
Internal Link Dist (ft)		675			2575			705			593	
Turn Bay Length (ft)	75		165	50		125	150			100		
Base Capacity (vph)	337	1104	493	382	943	422	227	688	307	361	1257	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.11	0.52	0.16	0.44	1.05	0.54	0.80	0.78	0.14	1.14	0.94	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 32 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 56.7 Intersection LOS: E
 Intersection Capacity Utilization 101.1% ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.























Splits and Phases: 6: 76th St & Rawson Ave



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal

3: 68th St & Rawson Ave























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	1060	65	70	1500	70	40	55	40	35	70	40
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	1845	1845	1845	1863	1863	1863	1900	1845	1845	1900	1863	1863
Adj Flow Rate, veh/h	53	1128	35	74	1596	37	43	59	21	37	74	21
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	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, %	3	3	3	2	2	2	3	3	3	2	2	2
Cap, veh/h	265	1927	862	386	1984	888	68	64	249	64	90	252
Arrive On Green	0.06	0.55	0.55	0.07	0.56	0.56	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1757	3505	1568	1774	3539	1583	0	406	1568	0	566	1583
Grp Volume(v), veh/h	53	1128	35	74	1596	37	102	0	21	111	0	21
Grp Sat Flow(s),veh/h/ln	1757	1752	1568	1774	1770	1583	406	0	1568	566	0	1583
Q Serve(g_s), s	0.9	16.1	0.8	1.2	27.3	0.8	0.0	0.0	0.9	0.0	0.0	0.9
Cycle Q Clear(g_c), s	0.9	16.1	0.8	1.2	27.3	0.8	12.0	0.0	0.9	12.0	0.0	0.9
Prop In Lane	1.00		1.00	1.00		1.00	0.42		1.00	0.33		1.00
Lane Grp Cap(c), veh/h	265	1927	862	386	1984	888	132	0	249	154	0	252
V/C Ratio(X)	0.20	0.59	0.04	0.19	0.80	0.04	0.77	0.00	0.08	0.72	0.00	0.08
Avail Cap(c_a), veh/h	563	2041	913	668	2061	922	132	0	249	154	0	252
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	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.5	11.3	7.8	7.6	13.3	7.5	31.0	0.0	27.1	29.5	0.0	27.1
Incr Delay (d2), s/veh	0.4	0.4	0.0	0.2	2.3	0.0	23.9	0.0	0.1	15.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.8	0.3	0.6	13.7	0.3	3.0	0.0	0.4	2.9	0.0	0.4
LnGrp Delay(d),s/veh	11.8	11.7	7.9	7.9	15.6	7.5	54.9	0.0	27.2	44.9	0.0	27.2
LnGrp LOS	B	B	A	A	B	A	D		C	D		C
Approach Vol, veh/h		1216			1707			123			132	
Approach Delay, s/veh		11.6			15.1			50.2			42.1	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.0	10.0	47.5		18.0	9.2	48.3				
Change Period (Y+Rc), s		6.0	4.5	6.0		6.0	4.5	6.0				
Max Green Setting (Gmax), s		12.0	17.5	44.0		12.0	17.5	44.0				
Max Q Clear Time (g_c+I1), s		14.0	3.2	18.1		14.0	2.9	29.3				
Green Ext Time (p_c), s		0.0	0.1	21.4		0.0	0.1	13.1				
Intersection Summary												
HCM 2010 Ctrl Delay			16.2									
HCM 2010 LOS			B									

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal

3: 68th St & Rawson Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1060	65	70	1500	70	40	55	40	35	70	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	205		115	200		125	0		100	0		100
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.979			0.984	
Satd. Flow (prot)	1752	3505	1568	1770	3539	1583	0	1806	1568	0	1833	1583
Flt Permitted	0.099			0.190				0.812			0.849	
Satd. Flow (perm)	183	3505	1568	354	3539	1583	0	1498	1568	0	1581	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		2655			544			394			1251	
Travel Time (s)		45.3			9.3			9.0			28.4	
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
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	53	1128	35	74	1596	37	43	59	21	37	74	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	1128	35	74	1596	37	0	102	21	0	111	21
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	21.0	21.0	11.5	21.0	21.0	16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	22.0	50.0	50.0	22.0	50.0	50.0	18.0	18.0	18.0	18.0	18.0	18.0
Total Split (%)	24.4%	55.6%	55.6%	24.4%	55.6%	55.6%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	46.3	41.4	41.4	47.3	44.1	44.1		11.5	11.5		11.5	11.5
Actuated g/C Ratio	0.69	0.62	0.62	0.70	0.66	0.66		0.17	0.17		0.17	0.17
v/c Ratio	0.17	0.52	0.04	0.18	0.69	0.04		0.40	0.08		0.41	0.08
Control Delay	4.8	11.9	8.4	4.5	13.6	8.1		35.2	30.1		35.2	30.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	4.8	11.9	8.4	4.5	13.6	8.1		35.2	30.1		35.2	30.1
LOS	A	B	A	A	B	A		D	C		D	C
Approach Delay		11.5			13.1			34.3			34.4	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	6	171	7	8	299	7		47	9		51	9

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal

3: 68th St & Rawson Ave

Lanes, Volumes, Timings

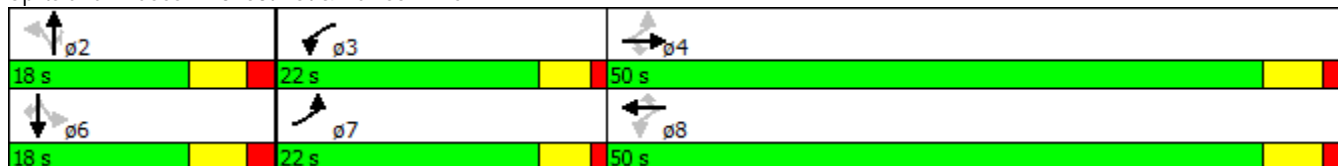


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	15	240	20	19	414	21		95	29		101	29
Internal Link Dist (ft)		2575			464			314			1171	
Turn Bay Length (ft)	205		115	200		125			100			100
Base Capacity (vph)	574	2405	1076	658	2428	1086		288	301		303	304
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.09	0.47	0.03	0.11	0.66	0.03		0.35	0.07		0.37	0.07

Intersection Summary




















Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	67.1
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	14.2
Intersection LOS:	B
Intersection Capacity Utilization:	73.3%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 3: 68th St & Rawson Ave



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	5	115	5	1	5	240	1010	10	5	1190	95
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	1845	1900	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	43	5	125	5	1	5	261	1098	11	5	1293	52
Adj No. of Lanes	0	1	0	0	1	0	1	3	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	17	137	118	36	80	322	3865	39	457	2635	1179
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	1.00	1.00	1.00	0.74	0.74	0.74
Sat Flow, veh/h	294	136	1121	490	296	655	404	5192	52	506	3539	1583
Grp Volume(v), veh/h	173	0	0	11	0	0	261	717	392	5	1293	52
Grp Sat Flow(s),veh/h/ln	1551	0	0	1442	0	0	404	1695	1854	506	1770	1583
Q Serve(g_s), s	7.4	0.0	0.0	0.0	0.0	0.0	53.8	0.0	0.0	0.2	13.2	0.8
Cycle Q Clear(g_c), s	9.9	0.0	0.0	0.5	0.0	0.0	67.0	0.0	0.0	0.2	13.2	0.8
Prop In Lane	0.25		0.72	0.45		0.45	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	239	0	0	234	0	0	322	2524	1380	457	2635	1179
V/C Ratio(X)	0.72	0.00	0.00	0.05	0.00	0.00	0.81	0.28	0.28	0.01	0.49	0.04
Avail Cap(c_a), veh/h	239	0	0	234	0	0	322	2524	1380	457	2635	1179
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.89	0.89	0.89	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.0	0.0	0.0	34.9	0.0	0.0	8.6	0.0	0.0	3.0	4.6	3.0
Incr Delay (d2), s/veh	10.2	0.0	0.0	0.1	0.0	0.0	17.8	0.3	0.5	0.0	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	0.0	0.2	0.0	0.0	8.0	0.1	0.2	0.0	6.5	0.4
LnGrp Delay(d),s/veh	49.2	0.0	0.0	35.0	0.0	0.0	26.4	0.3	0.5	3.0	5.3	3.1
LnGrp LOS	D			C			C	A	A	A	A	A
Approach Vol, veh/h		173			11			1370			1350	
Approach Delay, s/veh		49.2			35.0			5.3			5.2	
Approach LOS		D			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		73.0		17.0		73.0		17.0				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		67.0		11.0		67.0		11.0				
Max Q Clear Time (g_c+I1), s		69.0		11.9		15.2		2.5				
Green Ext Time (p_c), s		0.0		0.0		38.0		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			8.0									
HCM 2010 LOS			A									

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↑↑↑		↕	↑↑	↕
Volume (vph)	40	5	115	5	1	5	240	1010	10	5	1190	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	125		0	100		100
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Frt		0.902			0.939			0.999				0.850
Flt Protected		0.988			0.978		0.950			0.950		
Satd. Flow (prot)	0	1644	0	0	1711	0	1770	5080	0	1770	3539	1583
Flt Permitted		0.911			0.805		0.188			0.242		
Satd. Flow (perm)	0	1516	0	0	1408	0	350	5080	0	451	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40				40
Link Distance (ft)		558			782			302				707
Travel Time (s)		10.9			15.2			5.1				12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	43	5	125	5	1	5	261	1098	11	5	1293	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	11	0	261	1109	0	5	1293	52
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	16.0	16.0		16.0	16.0		18.0	18.0		18.0	18.0	18.0
Total Split (s)	17.0	17.0		17.0	17.0		73.0	73.0		73.0	73.0	73.0
Total Split (%)	18.9%	18.9%		18.9%	18.9%		81.1%	81.1%		81.1%	81.1%	81.1%
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)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		11.0			11.0		67.0	67.0		67.0	67.0	67.0
Actuated g/C Ratio		0.12			0.12		0.74	0.74		0.74	0.74	0.74
v/c Ratio		0.94			0.06		1.00	0.29		0.01	0.49	0.04
Control Delay		93.0			36.1		77.2	2.1		3.2	5.4	3.2
Queue Delay		0.0			0.0		0.0	0.1		0.0	0.1	0.0
Total Delay		93.0			36.1		77.2	2.2		3.2	5.4	3.2
LOS		F			D		E	A		A	A	A
Approach Delay		93.0			36.1			16.5			5.3	
Approach LOS		F			D			B			A	
Queue Length 50th (ft)		99			6		~162	4		1	126	6

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		#223			21		#315	7		3	162	15
Internal Link Dist (ft)		478			702			222			627	
Turn Bay Length (ft)							125			100		100
Base Capacity (vph)		185			172		260	3781		335	2634	1178
Starvation Cap Reductn		0			0		0	1308		0	0	0
Spillback Cap Reductn		0			0		0	0		0	195	0
Storage Cap Reductn		0			0		0	0		0	0	0
Reduced v/c Ratio		0.94			0.06		1.00	0.45		0.01	0.53	0.04

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 74 (82%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 15.9
 Intersection LOS: B
 Intersection Capacity Utilization 71.6%
 ICU Level of Service C
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



















Splits and Phases: 15: 76th St & Crystal Ridge Dr/Old Loomis Rd



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal




















11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	430	1	95	15	1140	0	0	1145	170
Number				3	8	18	5	2	12	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		1.00
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				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				467	1	0	16	1239	0	0	1245	185
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				535	1	478	192	2809	0	0	2470	367
Arrive On Green				0.30	0.30	0.00	1.00	1.00	0.00	0.00	0.18	0.18
Sat Flow, veh/h				1770	4	1583	373	5253	0	0	4639	664
Grp Volume(v), veh/h				468	0	0	16	1239	0	0	944	486
Grp Sat Flow(s),veh/h/ln				1774	0	1583	373	1695	0	0	1695	1745
Q Serve(g_s), s				22.5	0.0	0.0	1.9	0.0	0.0	0.0	22.6	22.6
Cycle Q Clear(g_c), s				22.5	0.0	0.0	24.5	0.0	0.0	0.0	22.6	22.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		0.38
Lane Grp Cap(c), veh/h				536	0	478	192	2809	0	0	1873	964
V/C Ratio(X)				0.87	0.00	0.00	0.08	0.44	0.00	0.00	0.50	0.50
Avail Cap(c_a), veh/h				777	0	693	192	2809	0	0	1873	964
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	0.00	0.94	0.94	0.00	0.00	0.86	0.86
Uniform Delay (d), s/veh				29.8	0.0	0.0	5.6	0.0	0.0	0.0	25.7	25.7
Incr Delay (d2), s/veh				7.7	0.0	0.0	0.8	0.5	0.0	0.0	0.8	1.6
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(50%),veh/ln				12.2	0.0	0.0	0.2	0.1	0.0	0.0	10.8	11.3
LnGrp Delay(d),s/veh				37.5	0.0	0.0	6.4	0.5	0.0	0.0	26.5	27.3
LnGrp LOS				D			A	A			C	C
Approach Vol, veh/h					468			1255			1430	
Approach Delay, s/veh					37.5			0.6			26.8	
Approach LOS					D			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		55.2				55.2		34.8				
Change Period (Y+Rc), s		5.5				5.5		7.6				
Max Green Setting (Gmax), s		37.5				37.5		39.4				
Max Q Clear Time (g_c+I1), s		26.5				24.6		24.5				
Green Ext Time (p_c), s		9.0				10.3		2.7				
Intersection Summary												
HCM 2010 Ctrl Delay				17.9								
HCM 2010 LOS				B								

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	430	1	95	15	1140	0	0	1145	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	75		0	0		0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Fr _t						0.850					0.981	
Fl _t Protected					0.952		0.950					
Satd. Flow (prot)	0	0	0	0	1773	1583	1770	5085	0	0	4989	0
Fl _t Permitted					0.952		0.130					
Satd. Flow (perm)	0	0	0	0	1773	1583	242	5085	0	0	4989	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		558			764			684			302	
Travel Time (s)		12.7			17.4			11.7			5.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	0	0	467	1	52	16	1239	0	0	1245	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	468	52	16	1239	0	0	1430	0
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Detector Phase				8	8	8	2	2			6	
Switch Phase												
Minimum Initial (s)				8.0	8.0	8.0	15.0	15.0			15.0	
Minimum Split (s)				15.6	15.6	15.6	20.5	20.5			20.5	
Total Split (s)				47.0	47.0	47.0	43.0	43.0			43.0	
Total Split (%)				52.2%	52.2%	52.2%	47.8%	47.8%			47.8%	
Yellow Time (s)				4.6	4.6	4.6	4.0	4.0			4.0	
All-Red Time (s)				3.0	3.0	3.0	1.5	1.5			1.5	
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)					7.6	7.6	5.5	5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode				None	None	None	C-Min	C-Min			C-Min	
Act Effct Green (s)					29.7	29.7	47.2	47.2			47.2	
Actuated g/C Ratio					0.33	0.33	0.52	0.52			0.52	
v/c Ratio					0.80	0.10	0.13	0.46			0.55	
Control Delay					37.7	18.8	11.9	9.0			13.2	
Queue Delay					0.0	0.0	0.0	0.0			0.2	
Total Delay					37.7	18.8	11.9	9.0			13.5	
LOS					D	B	B	A			B	
Approach Delay					35.9			9.0			13.5	
Approach LOS					D			A			B	
Queue Length 50th (ft)					236	20	4	124			131	
Queue Length 95th (ft)					307	39	m13	157			m291	

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

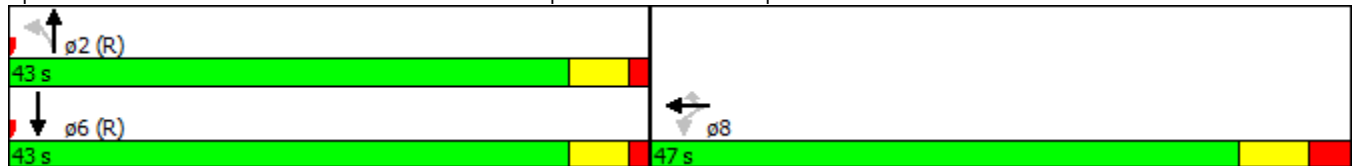
Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		478			684			604			222	
Turn Bay Length (ft)						75	75					
Base Capacity (vph)					776	693	127	2667			2617	
Starvation Cap Reductn					0	0	0	0			445	
Spillback Cap Reductn					0	0	0	0			0	
Storage Cap Reductn					0	0	0	0			0	
Reduced v/c Ratio					0.60	0.08	0.13	0.46			0.66	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 15.4
 Intersection LOS: B
 Intersection Capacity Utilization 77.8%
 ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.






















Splits and Phases: 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp



Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal

7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			  	
Volume (veh/h)	125	1	5	0	0	0	0	955	250	45	1540	0
Number	7	4	14				5	2	12	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		1.00
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	1900	1863	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	132	1	0				0	1005	263	47	1621	0
Adj No. of Lanes	0	1	1				0	3	0	1	3	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	2				0	2	2	2	2	0
Cap, veh/h	189	1	170				0	3052	797	411	3863	0
Arrive On Green	0.11	0.11	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Sat Flow, veh/h	1761	13	1583				0	4185	1050	435	5253	0
Grp Volume(v), veh/h	133	0	0				0	848	420	47	1621	0
Grp Sat Flow(s),veh/h/ln	1775	0	1583				0	1695	1677	435	1695	0
Q Serve(g_s), s	6.5	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.5	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.99		1.00				0.00		0.63	1.00		0.00
Lane Grp Cap(c), veh/h	190	0	170				0	2575	1274	411	3863	0
V/C Ratio(X)	0.70	0.00	0.00				0.00	0.33	0.33	0.11	0.42	0.00
Avail Cap(c_a), veh/h	414	0	369				0	2575	1274	411	3863	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.43	0.43	0.82	0.82	0.00
Uniform Delay (d), s/veh	38.8	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	4.6	0.0	0.0				0.0	0.1	0.3	0.5	0.3	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
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.0				0.0	0.1	0.1	0.1	0.1	0.0
LnGrp Delay(d),s/veh	43.4	0.0	0.0				0.0	0.1	0.3	0.5	0.3	0.0
LnGrp LOS	D							A	A	A	A	
Approach Vol, veh/h		133						1268			1668	
Approach Delay, s/veh		43.4						0.2			0.3	
Approach LOS		D						A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		74.4		15.6		74.4						
Change Period (Y+Rc), s		6.0		6.0		6.0						
Max Green Setting (Gmax), s		57.0		21.0		57.0						
Max Q Clear Time (g_c+I1), s		2.0		8.5		2.0						
Green Ext Time (p_c), s		39.7		0.5		39.7						
Intersection Summary												
HCM 2010 Ctrl Delay			2.1									
HCM 2010 LOS			A									

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕↕↕		↖	↕↕↕	
Volume (vph)	125	1	5	0	0	0	0	955	250	45	1540	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	0		0	115		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Fr _t			0.850					0.969				
Fl _t Protected		0.953								0.950		
Satd. Flow (prot)	0	1775	1583	0	0	0	0	4928	0	1770	5085	0
Fl _t Permitted		0.953								0.199		
Satd. Flow (perm)	0	1775	1583	0	0	0	0	4928	0	371	5085	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		555			481			673			684	
Travel Time (s)		12.6			10.9			11.5			11.7	
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
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	132	1	3	0	0	0	0	1005	263	47	1621	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	3	0	0	0	0	1268	0	47	1621	0
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					12.0		12.0	12.0	
Minimum Split (s)	16.0	16.0	16.0					18.0		18.0	18.0	
Total Split (s)	27.0	27.0	27.0					63.0		63.0	63.0	
Total Split (%)	30.0%	30.0%	30.0%					70.0%		70.0%	70.0%	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0					6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None					C-Max		C-Max	C-Max	
Act Effct Green (s)		12.5	12.5					65.5		65.5	65.5	
Actuated g/C Ratio		0.14	0.14					0.73		0.73	0.73	
v/c Ratio		0.54	0.01					0.35		0.17	0.44	
Control Delay		43.8	31.3					4.8		4.4	4.1	
Queue Delay		0.0	0.0					0.0		0.0	0.0	
Total Delay		43.8	31.3					4.8		4.4	4.1	
LOS		D	C					A		A	A	
Approach Delay		43.5						4.8			4.1	
Approach LOS		D						A			A	
Queue Length 50th (ft)		72	2					77		3	35	
Queue Length 95th (ft)		122	9					m127		m12	97	

Year 2032 Total Weekday PM Peak Hour Traffic Analysis - Signal
 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		475			401			593			604	
Turn Bay Length (ft)			100							115		
Base Capacity (vph)		414	369					3584		269	3698	
Starvation Cap Reductn		0	0					0		0	0	
Spillback Cap Reductn		0	0					0		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.32	0.01					0.35		0.17	0.44	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 1 (1%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 6.1
 Intersection LOS: A
 Intersection Capacity Utilization 77.8%
 ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.
























Splits and Phases: 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal

28: STH 36 & Drexel Ave
























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	160	215	145	50	215	55	140	630	65	35	520	155
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	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	176	236	80	55	236	60	154	692	36	38	571	85
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	337	610	518	370	469	119	393	1557	697	318	935	419
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.10	0.44	0.44	0.26	0.26	0.26
Sat Flow, veh/h	1079	1863	1583	1059	1434	365	1774	3539	1583	724	3539	1583
Grp Volume(v), veh/h	176	236	80	55	0	296	154	692	36	38	571	85
Grp Sat Flow(s),veh/h/ln	1079	1863	1583	1059	0	1798	1774	1770	1583	724	1770	1583
Q Serve(g_s), s	8.9	5.5	2.0	2.4	0.0	7.5	3.3	7.7	0.7	2.3	8.0	2.4
Cycle Q Clear(g_c), s	16.4	5.5	2.0	7.9	0.0	7.5	3.3	7.7	0.7	2.3	8.0	2.4
Prop In Lane	1.00		1.00	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	337	610	518	370	0	589	393	1557	697	318	935	419
V/C Ratio(X)	0.52	0.39	0.15	0.15	0.00	0.50	0.39	0.44	0.05	0.12	0.61	0.20
Avail Cap(c_a), veh/h	343	620	527	376	0	599	413	1740	778	348	1079	483
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	22.0	14.7	13.5	17.8	0.0	15.4	12.4	11.1	9.1	16.2	18.3	16.2
Incr Delay (d2), s/veh	0.6	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.0	0.2	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.8	0.9	0.7	0.0	3.7	1.6	3.8	0.3	0.5	4.0	1.1
LnGrp Delay(d),s/veh	22.6	14.8	13.6	17.8	0.0	15.6	12.7	11.3	9.1	16.4	19.1	16.5
LnGrp LOS	C	B	B	B		B	B	B	A	B	B	B
Approach Vol, veh/h		492			351			882			694	
Approach Delay, s/veh		17.4			16.0			11.4			18.6	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		31.1		25.7	10.0	21.1		25.7				
Change Period (Y+Rc), s		* 6.1		7.1	4.5	* 6.1		7.1				
Max Green Setting (Gmax), s		* 28		18.9	6.1	* 17		18.9				
Max Q Clear Time (g_c+I1), s		9.7		18.4	5.3	10.0		9.9				
Green Ext Time (p_c), s		8.3		0.2	0.0	4.5		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			15.4									
HCM 2010 LOS			B									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal

28: STH 36 & Drexel Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	215	145	50	215	55	140	630	65	35	520	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		130	195		0	390		230	350		145
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.970				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1807	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.559			0.612			0.320			0.389		
Satd. Flow (perm)	1041	1863	1583	1140	1807	0	596	3539	1583	725	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		569			956			666			3068	
Travel Time (s)		11.1			18.6			10.1			46.5	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	176	236	80	55	236	60	154	692	36	38	571	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	176	236	80	55	296	0	154	692	36	38	571	85
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		6.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.1	23.1	23.1	23.1	23.1		10.5	22.1	22.1	22.1	22.1	22.1
Total Split (s)	26.0	26.0	26.0	26.0	26.0		10.6	34.0	34.0	23.4	23.4	23.4
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%		17.7%	56.7%	56.7%	39.0%	39.0%	39.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		1.0	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1		4.5	6.1	6.1	6.1	6.1	6.1
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	Min
Act Effect Green (s)	13.5	13.5	13.5	13.5	13.5		25.8	24.2	24.2	16.2	16.2	16.2
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26		0.50	0.47	0.47	0.32	0.32	0.32
v/c Ratio	0.64	0.48	0.19	0.18	0.62		0.35	0.41	0.05	0.17	0.51	0.17
Control Delay	29.8	20.4	16.7	17.1	23.9		9.8	10.0	8.3	17.5	17.7	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	20.4	16.7	17.1	23.9		9.8	10.0	8.3	17.5	17.7	16.1
LOS	C	C	B	B	C		A	B	A	B	B	B
Approach Delay		23.2			22.8			9.9			17.5	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)	48	62	19	13	81		21	62	5	9	75	19
Queue Length 95th (ft)	108	120	48	37	152		57	119	20	31	136	52

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal

28: STH 36 & Drexel Ave

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		489			876			586			2988	
Turn Bay Length (ft)	130		130	195			390		230	350		145
Base Capacity (vph)	394	705	599	431	684		444	1977	884	251	1226	548
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.33	0.13	0.13	0.43		0.35	0.35	0.04	0.15	0.47	0.16

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	51.2
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	16.6
Intersection LOS:	B
Intersection Capacity Utilization:	75.4%
ICU Level of Service:	D
Analysis Period (min):	15





















Splits and Phases: 28: STH 36 & Drexel Ave



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal






















18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	55	445	20	135	480	225	25	1	115	205	1	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	1863	1863	1863	1845	1845	1845	1900	1863	1900	1900	1681	1900
Adj Flow Rate, veh/h	60	484	11	147	522	122	27	1	125	223	1	60
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	13	13	13
Cap, veh/h	429	1580	707	474	1564	700	134	45	391	424	16	81
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	783	3539	1583	890	3505	1568	144	153	1326	967	56	274
Grp Volume(v), veh/h	60	484	11	147	522	122	153	0	0	284	0	0
Grp Sat Flow(s),veh/h/ln	783	1770	1583	890	1752	1568	1624	0	0	1296	0	0
Q Serve(g_s), s	2.5	4.1	0.2	5.9	4.5	2.2	0.0	0.0	0.0	5.3	0.0	0.0
Cycle Q Clear(g_c), s	7.0	4.1	0.2	9.9	4.5	2.2	3.4	0.0	0.0	8.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.18		0.82	0.79		0.21
Lane Grp Cap(c), veh/h	429	1580	707	474	1564	700	570	0	0	521	0	0
V/C Ratio(X)	0.14	0.31	0.02	0.31	0.33	0.17	0.27	0.00	0.00	0.55	0.00	0.00
Avail Cap(c_a), veh/h	671	2672	1195	749	2646	1184	1541	0	0	1274	0	0
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	0.00
Uniform Delay (d), s/veh	10.6	8.2	7.2	11.4	8.3	7.7	12.7	0.0	0.0	14.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.4	0.1	0.1	0.3	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.0	0.1	1.5	2.2	0.9	1.5	0.0	0.0	3.4	0.0	0.0
LnGrp Delay(d),s/veh	10.8	8.3	7.2	11.8	8.5	7.8	13.0	0.0	0.0	15.2	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B			B		
Approach Vol, veh/h		555			791			153				284
Approach Delay, s/veh		8.6			9.0			13.0				15.2
Approach LOS		A			A			B				B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		19.7		26.7		19.7		26.7				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		43.0		35.0		43.0		35.0				
Max Q Clear Time (g_c+I1), s		5.4		9.0		10.6		11.9				
Green Ext Time (p_c), s		3.1		9.2		3.0		8.7				
Intersection Summary												
HCM 2010 Ctrl Delay			10.2									
HCM 2010 LOS			B									

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	445	20	135	480	225	25	1	115	205	1	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		100	125		165	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.890			0.971	
Flt Protected	0.950			0.950				0.991			0.962	
Satd. Flow (prot)	1770	3539	1583	1752	3505	1568	0	1643	0	0	1571	0
Flt Permitted	0.459			0.476				0.910			0.674	
Satd. Flow (perm)	855	3539	1583	878	3505	1568	0	1509	0	0	1100	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1015			447			386			310	
Travel Time (s)		17.3			7.6			7.5			6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	13%	13%	13%
Adj. Flow (vph)	60	484	11	147	522	122	27	1	125	223	1	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	484	11	147	522	122	0	153	0	0	284	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	18.0	18.0	18.0	18.0	18.0	18.0	16.0	16.0		16.0	16.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%	54.4%	54.4%		54.4%	54.4%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		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)	6.0	6.0	6.0	6.0	6.0	6.0		6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Min	Min		Min	Min	
Act Effect Green (s)	18.1	18.1	18.1	18.1	18.1	18.1		18.7			18.7	
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36		0.37			0.37	
v/c Ratio	0.19	0.38	0.02	0.46	0.41	0.21		0.27			0.69	
Control Delay	14.6	13.5	12.5	19.6	13.8	13.7		13.0			23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	14.6	13.5	12.5	19.6	13.8	13.7		13.0			23.8	
LOS	B	B	B	B	B	B		B			C	
Approach Delay		13.6			14.8			13.0			23.8	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	10	47	2	28	51	21		26			58	

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave

Lanes, Volumes, Timings

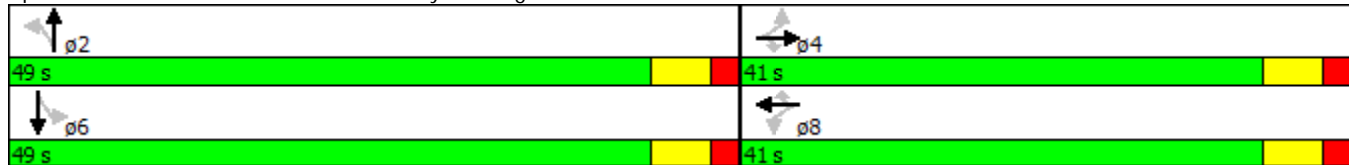


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	44	119	12	101	129	73		84			183	
Internal Link Dist (ft)		935			367			306			230	
Turn Bay Length (ft)	130		100	125		165						
Base Capacity (vph)	650	2690	1203	667	2665	1192		1290			941	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.09	0.18	0.01	0.22	0.20	0.10		0.12			0.30	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	50
Natural Cycle:	40
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	15.7
Intersection LOS:	B
Intersection Capacity Utilization	59.7%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 18: Old Loomis Rd/Crystal Ridge Dr & Rawson Ave



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 24: STH 36 NB Off Ramp & Rawson Ave

HCM 2010 TWSC

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	720	0	0	1065	40	220
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	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	742	0	0	1098	41	227

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	742
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	861
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	861
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	531	-	-	861	-
HCM Lane V/C Ratio	0.505	-	-	-	-
HCM Control Delay (s)	18.5	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.8	-	-	0	-

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 24: STH 36 NB Off Ramp & Rawson Ave

Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	720	0	0	1065	40	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt					0.886	
Flt Protected					0.992	
Satd. Flow (prot)	3539	0	0	3539	1637	0
Flt Permitted					0.992	
Satd. Flow (perm)	3539	0	0	3539	1637	0
Link Speed (mph)	40			40	30	
Link Distance (ft)	954			755	294	
Travel Time (s)	16.3			12.9	6.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	742	0	0	1098	41	227
Shared Lane Traffic (%)						
Lane Group Flow (vph)	742	0	0	1098	268	0
Sign Control	Free			Free	Stop	

























Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal

6: 76th St & Rawson Ave






























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	395	550	165	145	540	350	195	500	105	305	515	370
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	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	411	573	86	151	562	182	203	521	55	318	536	385
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	1	3	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	2	2	2	2	2	2
Cap, veh/h	451	1021	457	355	629	281	252	807	361	415	999	466
Arrive On Green	0.20	0.29	0.29	0.09	0.18	0.18	0.08	0.23	0.23	0.05	0.10	0.10
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	3539	1583	1774	3390	1583
Grp Volume(v), veh/h	411	573	86	151	562	182	203	521	55	318	536	385
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1770	1583	1774	1695	1583
Q Serve(g_s), s	16.3	12.4	3.7	6.1	14.0	9.6	7.0	12.0	2.5	11.6	13.6	21.5
Cycle Q Clear(g_c), s	16.3	12.4	3.7	6.1	14.0	9.6	7.0	12.0	2.5	11.6	13.6	21.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	451	1021	457	355	629	281	252	807	361	415	999	466
V/C Ratio(X)	0.91	0.56	0.19	0.43	0.89	0.65	0.81	0.65	0.15	0.77	0.54	0.83
Avail Cap(c_a), veh/h	451	1021	457	394	629	281	252	807	361	415	999	466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh	22.9	27.2	24.1	26.5	36.2	34.4	28.3	31.5	27.8	24.3	34.8	38.4
Incr Delay (d2), s/veh	22.7	0.7	0.2	0.7	13.4	4.4	17.3	4.0	0.9	7.9	2.0	14.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	6.1	1.6	3.0	8.0	4.5	2.8	6.3	1.2	6.5	6.7	11.3
LnGrp Delay(d),s/veh	45.5	27.9	24.3	27.2	49.6	38.8	45.5	35.4	28.7	32.3	36.7	53.0
LnGrp LOS	D	C	C	C	D	D	D	D	C	C	D	D
Approach Vol, veh/h		1070			895			779			1239	
Approach Delay, s/veh		34.4			43.6			37.6			40.6	
Approach LOS		C			D			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	18.0	27.0	13.0	32.0	12.0	33.0	23.0	22.0				
Change Period (Y+Rc), s	5.0	6.5	5.0	6.0	5.0	6.5	5.0	6.0				
Max Green Setting (Gmax), s	13.0	20.5	10.0	24.0	7.0	26.5	18.0	16.0				
Max Q Clear Time (g_c+I1), s	13.6	14.0	8.1	14.4	9.0	23.5	18.3	16.0				
Green Ext Time (p_c), s	0.0	4.4	0.1	5.4	0.0	2.2	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			39.0									
HCM 2010 LOS			D									

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal

6: 76th St & Rawson Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			  	
Volume (vph)	395	550	165	145	540	350	195	500	105	305	515	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		165	50		125	150		0	100		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.937	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	4765	0
Flt Permitted	0.190			0.436			0.249			0.247		
Satd. Flow (perm)	354	3539	1583	812	3539	1583	464	3539	1583	460	4765	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		755			2655			785			673	
Travel Time (s)		12.9			45.3			13.4			11.5	
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
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	411	573	86	151	562	182	203	521	55	318	536	385
Shared Lane Traffic (%)												
Lane Group Flow (vph)	411	573	86	151	562	182	203	521	55	318	921	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	15.0	15.0	7.0	15.0	
Minimum Split (s)	12.0	21.0	21.0	12.0	21.0	21.0	12.0	21.5	21.5	12.0	21.5	
Total Split (s)	23.0	30.0	30.0	15.0	22.0	22.0	12.0	27.0	27.0	18.0	33.0	
Total Split (%)	25.6%	33.3%	33.3%	16.7%	24.4%	24.4%	13.3%	30.0%	30.0%	20.0%	36.7%	
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	2.5	2.5	1.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min	
Act Effect Green (s)	41.4	26.3	26.3	26.0	15.9	15.9	28.3	19.4	19.4	38.2	24.7	
Actuated g/C Ratio	0.46	0.29	0.29	0.29	0.18	0.18	0.31	0.22	0.22	0.42	0.27	
v/c Ratio	0.88	0.56	0.19	0.45	0.90	0.65	0.80	0.68	0.16	0.83	0.89dr	
Control Delay	43.1	29.9	26.2	20.9	55.3	46.5	44.7	37.7	29.9	31.5	25.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	43.1	29.9	26.2	20.9	55.3	46.5	44.7	37.7	29.9	31.5	25.7	
LOS	D	C	C	C	E	D	D	D	C	C	C	
Approach Delay		34.7			47.7			39.0			27.2	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	170	146	37	49	166	97	72	144	26	129	186	
Queue Length 95th (ft)	#355	205	76	89	#260	#178	#156	196	57	#200	229	

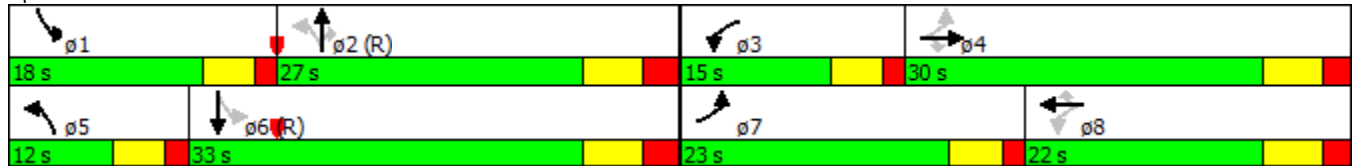
Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 6: 76th St & Rawson Ave

Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		675			2575			705			593	
Turn Bay Length (ft)	75		165	50		125	150			100		
Base Capacity (vph)	468	1032	461	349	629	281	253	806	360	385	1403	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.56	0.19	0.43	0.89	0.65	0.80	0.65	0.15	0.83	0.66	

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	42 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.90
Intersection Signal Delay:	36.1
Intersection LOS:	D
Intersection Capacity Utilization	86.3%
ICU Level of Service	E
Analysis Period (min)	15
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
dr	Defacto Right Lane. Recode with 1 though lane as a right lane.























Splits and Phases: 6: 76th St & Rawson Ave



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal

3: 68th St & Rawson Ave























HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	990	65	45	1040	35	40	45	50	30	50	25
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	1863	1900	1863	1863	1900	1827	1827
Adj Flow Rate, veh/h	37	1042	34	47	1095	18	42	47	26	32	53	13
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	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	2	2	2	4	4	4
Cap, veh/h	348	1829	818	370	1858	831	74	57	308	69	81	302
Arrive On Green	0.05	0.52	0.52	0.06	0.53	0.53	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	0	295	1583	0	417	1553
Grp Volume(v), veh/h	37	1042	34	47	1095	18	89	0	26	85	0	13
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	295	0	1583	417	0	1553
Q Serve(g_s), s	0.7	14.5	0.8	0.8	15.3	0.4	0.0	0.0	1.0	0.0	0.0	0.5
Cycle Q Clear(g_c), s	0.7	14.5	0.8	0.8	15.3	0.4	14.0	0.0	1.0	14.0	0.0	0.5
Prop In Lane	1.00		1.00	1.00		1.00	0.47		1.00	0.38		1.00
Lane Grp Cap(c), veh/h	348	1829	818	370	1858	831	131	0	308	150	0	302
V/C Ratio(X)	0.11	0.57	0.04	0.13	0.59	0.02	0.68	0.00	0.08	0.57	0.00	0.04
Avail Cap(c_a), veh/h	467	2461	1101	499	2510	1123	131	0	308	150	0	302
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	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.5	11.9	8.6	8.3	11.7	8.2	27.7	0.0	23.7	25.3	0.0	23.5
Incr Delay (d2), s/veh	0.1	0.3	0.0	0.2	0.3	0.0	13.2	0.0	0.1	4.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	7.0	0.3	0.4	7.5	0.2	2.2	0.0	0.4	1.6	0.0	0.2
LnGrp Delay(d),s/veh	8.6	12.2	8.6	8.4	12.0	8.2	40.9	0.0	23.8	30.2	0.0	23.6
LnGrp LOS	A	B	A	A	B	A	D		C	C		C
Approach Vol, veh/h		1113			1160			115			98	
Approach Delay, s/veh		12.0			11.8			37.0			29.3	
Approach LOS		B			B			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.8	43.2		20.0	8.2	43.8				
Change Period (Y+Rc), s		6.0	4.5	6.0		6.0	4.5	6.0				
Max Green Setting (Gmax), s		14.0	9.5	50.0		14.0	8.5	51.0				
Max Q Clear Time (g_c+I1), s		16.0	2.8	16.5		16.0	2.7	17.3				
Green Ext Time (p_c), s		0.0	0.0	20.4		0.0	0.0	20.5				
Intersection Summary												
HCM 2010 Ctrl Delay			13.7									
HCM 2010 LOS			B									

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal

3: 68th St & Rawson Ave

Lanes, Volumes, Timings

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	990	65	45	1040	35	40	45	50	30	50	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	205		115	200		125	0		100	0		100
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.977			0.982	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1820	1583	0	1794	1553
Flt Permitted	0.213			0.207				0.807			0.838	
Satd. Flow (perm)	397	3539	1583	386	3539	1583	0	1503	1583	0	1531	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		2655			544			394			1251	
Travel Time (s)		45.3			9.3			9.0			28.4	
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
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	37	1042	34	47	1095	18	42	47	26	32	53	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	1042	34	47	1095	18	0	89	26	0	85	13
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	21.0	21.0	11.5	21.0	21.0	16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	13.0	56.0	56.0	14.0	57.0	57.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	14.4%	62.2%	62.2%	15.6%	63.3%	63.3%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	34.4	31.0	31.0	35.2	33.2	33.2		11.4	11.4		11.4	11.4
Actuated g/C Ratio	0.63	0.57	0.57	0.65	0.61	0.61		0.21	0.21		0.21	0.21
v/c Ratio	0.08	0.52	0.04	0.11	0.51	0.02		0.28	0.08		0.27	0.04
Control Delay	4.4	12.1	9.6	4.6	10.6	8.5		26.3	24.5		26.0	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	4.4	12.1	9.6	4.6	10.6	8.5		26.3	24.5		26.0	24.2
LOS	A	B	A	A	B	A		C	C		C	C
Approach Delay		11.8			10.3			25.9			25.7	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	4	148	7	5	93	2		28	8		26	4

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 3: 68th St & Rawson Ave

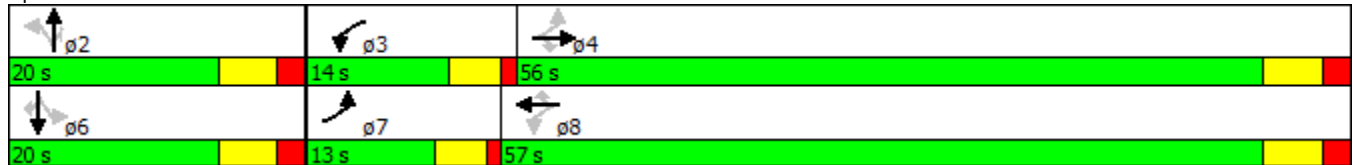
Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	13	224	21	15	240	13		77	31		74	19
Internal Link Dist (ft)		2575			464			314			1171	
Turn Bay Length (ft)	205		115	200		125			100			100
Base Capacity (vph)	487	3051	1365	515	3084	1379		416	439		424	430
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.08	0.34	0.02	0.09	0.36	0.01		0.21	0.06		0.20	0.03

Intersection Summary




















Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	54.5
Natural Cycle:	55
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	12.3
Intersection LOS:	B
Intersection Capacity Utilization:	60.4%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 3: 68th St & Rawson Ave



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	120	1	165	5	1	5	170	1050	5	1	905	60
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	1863	1900	1900	1727	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	128	1	176	5	1	5	181	1117	5	1	963	32
Adj No. of Lanes	0	1	0	0	1	0	1	3	0	1	2	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, %	2	2	2	10	10	10	2	2	2	2	2	2
Cap, veh/h	189	12	197	163	44	124	366	3353	15	401	2271	1016
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	1.00	1.00	1.00	0.64	0.64	0.64
Sat Flow, veh/h	588	54	875	466	196	552	564	5225	23	500	3539	1583
Grp Volume(v), veh/h	305	0	0	11	0	0	181	725	397	1	963	32
Grp Sat Flow(s),veh/h/ln	1516	0	0	1214	0	0	564	1695	1859	500	1770	1583
Q Serve(g_s), s	16.1	0.0	0.0	0.0	0.0	0.0	12.1	0.0	0.0	0.1	12.1	0.7
Cycle Q Clear(g_c), s	17.5	0.0	0.0	0.5	0.0	0.0	24.1	0.0	0.0	0.1	12.1	0.7
Prop In Lane	0.42		0.58	0.45		0.45	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	398	0	0	331	0	0	366	2175	1192	401	2271	1016
V/C Ratio(X)	0.77	0.00	0.00	0.03	0.00	0.00	0.49	0.33	0.33	0.00	0.42	0.03
Avail Cap(c_a), veh/h	461	0	0	385	0	0	366	2175	1192	401	2271	1016
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	0.0	0.0	27.2	0.0	0.0	2.5	0.0	0.0	5.8	7.9	5.9
Incr Delay (d2), s/veh	6.6	0.0	0.0	0.0	0.0	0.0	4.4	0.4	0.7	0.0	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.0	0.0	0.2	0.0	0.0	2.2	0.1	0.2	0.0	6.1	0.3
LnGrp Delay(d),s/veh	40.3	0.0	0.0	27.3	0.0	0.0	7.0	0.4	0.7	5.8	8.5	6.0
LnGrp LOS	D			C			A	A	A	A	A	A
Approach Vol, veh/h		305			11			1303			996	
Approach Delay, s/veh		40.3			27.3			1.4			8.4	
Approach LOS		D			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		63.7		26.3		63.7		26.3				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		54.0		24.0		54.0		24.0				
Max Q Clear Time (g_c+I1), s		26.1		19.5		14.1		2.5				
Green Ext Time (p_c), s		19.1		0.7		24.1		1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			8.7									
HCM 2010 LOS			A									

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↑↑↑		↗	↑↑	↗
Volume (vph)	120	1	165	5	1	5	170	1050	5	1	905	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	125		0	100		100
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Frt		0.922			0.939			0.999				0.850
Flt Protected		0.979			0.978		0.950			0.950		
Satd. Flow (prot)	0	1681	0	0	1586	0	1770	5080	0	1770	3539	1583
Flt Permitted		0.859			0.863		0.259			0.224		
Satd. Flow (perm)	0	1475	0	0	1400	0	482	5080	0	417	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40				40
Link Distance (ft)		558			782			302				707
Travel Time (s)		10.9			15.2			5.1				12.1
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	128	1	176	5	1	5	181	1117	5	1	963	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	305	0	0	11	0	181	1122	0	1	963	32
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	16.0	16.0		16.0	16.0		18.0	18.0		18.0	18.0	18.0
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	60.0
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	66.7%
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)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		21.8			21.8		56.2	56.2		56.2	56.2	56.2
Actuated g/C Ratio		0.24			0.24		0.62	0.62		0.62	0.62	0.62
v/c Ratio		0.85			0.03		0.60	0.35		0.00	0.44	0.03
Control Delay		55.3			24.9		15.7	2.2		7.0	9.9	7.4
Queue Delay		0.0			0.0		0.0	0.1		0.0	0.0	0.0
Total Delay		55.3			24.9		15.7	2.3		7.0	9.9	7.4
LOS		E			C		B	A		A	A	A
Approach Delay		55.3			24.9			4.2			9.8	
Approach LOS		E			C			A			A	
Queue Length 50th (ft)		160			5		27	15		0	145	7

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 15: 76th St & Crystal Ridge Dr/Old Loomis Rd

Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		#288			18		#129	20		2	188	18
Internal Link Dist (ft)		478			702			222			627	
Turn Bay Length (ft)							125			100		100
Base Capacity (vph)		393			373		301	3172		260	2209	988
Starvation Cap Reductn		0			0		0	659		0	0	0
Spillback Cap Reductn		0			0		0	0		0	38	0
Storage Cap Reductn		0			0		0	0		0	0	0
Reduced v/c Ratio		0.78			0.03		0.60	0.45		0.00	0.44	0.03

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 82 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 12.4 Intersection LOS: B
 Intersection Capacity Utilization 70.8% ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.






















Splits and Phases: 15: 76th St & Crystal Ridge Dr/Old Loomis Rd



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal

11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			  	
Volume (veh/h)	0	0	0	285	1	85	5	1135	0	0	955	155
Number				3	8	18	5	2	12	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		1.00
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				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				294	1	0	5	1170	0	0	985	160
Adj No. of Lanes				0	1	1	1	3	0	0	3	0
Peak Hour Factor				0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				354	1	317	307	3327	0	0	2886	468
Arrive On Green				0.20	0.20	0.00	1.00	1.00	0.00	0.00	0.22	0.22
Sat Flow, veh/h				1768	6	1583	489	5253	0	0	4580	715
Grp Volume(v), veh/h				295	0	0	5	1170	0	0	756	389
Grp Sat Flow(s),veh/h/ln				1774	0	1583	489	1695	0	0	1695	1737
Q Serve(g_s), s				14.4	0.0	0.0	0.3	0.0	0.0	0.0	17.0	17.1
Cycle Q Clear(g_c), s				14.4	0.0	0.0	17.3	0.0	0.0	0.0	17.0	17.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		0.41
Lane Grp Cap(c), veh/h				355	0	317	307	3327	0	0	2218	1136
V/C Ratio(X)				0.83	0.00	0.00	0.02	0.35	0.00	0.00	0.34	0.34
Avail Cap(c_a), veh/h				698	0	623	307	3327	0	0	2218	1136
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	0.00	0.95	0.95	0.00	0.00	0.90	0.90
Uniform Delay (d), s/veh				34.5	0.0	0.0	2.5	0.0	0.0	0.0	18.9	18.9
Incr Delay (d2), s/veh				5.0	0.0	0.0	0.1	0.3	0.0	0.0	0.4	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(50%),veh/ln				7.5	0.0	0.0	0.0	0.1	0.0	0.0	8.1	8.5
LnGrp Delay(d),s/veh				39.6	0.0	0.0	2.6	0.3	0.0	0.0	19.2	19.6
LnGrp LOS				D			A	A			B	B
Approach Vol, veh/h					295			1175			1145	
Approach Delay, s/veh					39.6			0.3			19.4	
Approach LOS					D			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		64.4				64.4		25.6				
Change Period (Y+Rc), s		5.5				5.5		7.6				
Max Green Setting (Gmax), s		41.5				41.5		35.4				
Max Q Clear Time (g_c+I1), s		19.3				19.1		16.4				
Green Ext Time (p_c), s		13.6				13.7		1.7				
Intersection Summary												
HCM 2010 Ctrl Delay				13.1								
HCM 2010 LOS				B								

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↘	↑↑↑			↑↑↑	
Volume (vph)	0	0	0	285	1	85	5	1135	0	0	955	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	75		0	0		0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Fr _t						0.850					0.979	
Fl _t Protected					0.953		0.950					
Satd. Flow (prot)	0	0	0	0	1775	1583	1770	5085	0	0	4979	0
Fl _t Permitted					0.953		0.216					
Satd. Flow (perm)	0	0	0	0	1775	1583	402	5085	0	0	4979	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		558			764			684			302	
Travel Time (s)		12.7			17.4			11.7			5.1	
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
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	0	0	294	1	44	5	1170	0	0	985	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	295	44	5	1170	0	0	1145	0
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Detector Phase				8	8	8	2	2			6	
Switch Phase												
Minimum Initial (s)				8.0	8.0	8.0	15.0	15.0			15.0	
Minimum Split (s)				23.6	23.6	23.6	21.5	21.5			21.5	
Total Split (s)				43.0	43.0	43.0	47.0	47.0			47.0	
Total Split (%)				47.8%	47.8%	47.8%	52.2%	52.2%			52.2%	
Yellow Time (s)				4.6	4.6	4.6	4.0	4.0			4.0	
All-Red Time (s)				3.0	3.0	3.0	1.5	1.5			1.5	
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)					7.6	7.6	5.5	5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode				None	None	None	C-Min	C-Min			C-Min	
Act Effect Green (s)					20.6	20.6	56.3	56.3			56.3	
Actuated g/C Ratio					0.23	0.23	0.63	0.63			0.63	
v/c Ratio					0.72	0.12	0.02	0.37			0.37	
Control Delay					41.9	25.7	5.2	4.7			5.3	
Queue Delay					0.0	0.0	0.0	0.0			0.1	
Total Delay					41.9	25.7	5.2	4.7			5.4	
LOS					D	C	A	A			A	
Approach Delay					39.8			4.7			5.4	
Approach LOS					D			A			A	
Queue Length 50th (ft)					156	20	0	80			60	
Queue Length 95th (ft)					218	42	m3	127			111	

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp

Lanes, Volumes, Timings

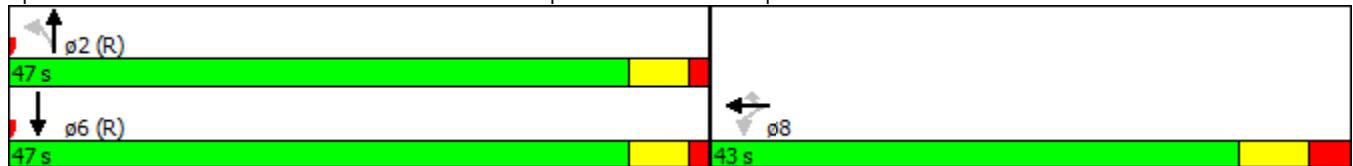


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		478			684			604			222	
Turn Bay Length (ft)						75	75					
Base Capacity (vph)					698	622	251	3178			3112	
Starvation Cap Reductn					0	0	0	0			718	
Spillback Cap Reductn					0	0	0	0			0	
Storage Cap Reductn					0	0	0	0			0	
Reduced v/c Ratio					0.42	0.07	0.02	0.37			0.48	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	24 (27%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	9.5
Intersection LOS:	A
Intersection Capacity Utilization	65.7%
ICU Level of Service	C
Analysis Period (min)	15
m Volume for 95th percentile queue is metered by upstream signal.	






















Splits and Phases: 11: 76th St & STH 36 SB On Ramp/STH 36 SB Off Ramp



Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal

7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

HCM 2010 Signalized Intersection Summary

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			  	
Volume (veh/h)	200	1	5	0	0	0	0	875	265	75	1155	0
Number	7	4	14				5	2	12	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		1.00
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	1900	1863	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	204	1	0				0	893	270	77	1179	0
Adj No. of Lanes	0	1	1				0	3	0	1	3	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	251	1	225				0	2810	846	428	3684	0
Arrive On Green	0.14	0.14	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Sat Flow, veh/h	1766	9	1583				0	4046	1168	481	5253	0
Grp Volume(v), veh/h	205	0	0				0	780	383	77	1179	0
Grp Sat Flow(s),veh/h/ln	1774	0	1583				0	1695	1657	481	1695	0
Q Serve(g_s), s	10.1	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.1	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.71	1.00		0.00
Lane Grp Cap(c), veh/h	252	0	225				0	2456	1200	428	3684	0
V/C Ratio(X)	0.81	0.00	0.00				0.00	0.32	0.32	0.18	0.32	0.00
Avail Cap(c_a), veh/h	453	0	405				0	2456	1200	428	3684	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.58	0.58	0.94	0.94	0.00
Uniform Delay (d), s/veh	37.4	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.2	0.0	0.0				0.0	0.2	0.4	0.9	0.2	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
%ile BackOfQ(50%),veh/ln	5.4	0.0	0.0				0.0	0.1	0.1	0.1	0.1	0.0
LnGrp Delay(d),s/veh	43.6	0.0	0.0				0.0	0.2	0.4	0.9	0.2	0.0
LnGrp LOS	D							A	A	A	A	
Approach Vol, veh/h		205						1163			1256	
Approach Delay, s/veh		43.6						0.3			0.3	
Approach LOS		D						A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		71.2		18.8		71.2						
Change Period (Y+Rc), s		6.0		6.0		6.0						
Max Green Setting (Gmax), s		55.0		23.0		55.0						
Max Q Clear Time (g_c+I1), s		2.0		12.1		2.0						
Green Ext Time (p_c), s		30.3		0.8		30.3						
Intersection Summary												
HCM 2010 Ctrl Delay			3.6									
HCM 2010 LOS			A									

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕↕↕		↗	↕↕↕	
Volume (vph)	200	1	5	0	0	0	0	875	265	75	1155	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	0		0	115		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Fr _t			0.850					0.965				
Fl _t Protected		0.953								0.950		
Satd. Flow (prot)	0	1775	1583	0	0	0	0	4907	0	1770	5085	0
Fl _t Permitted		0.953								0.222		
Satd. Flow (perm)	0	1775	1583	0	0	0	0	4907	0	414	5085	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		555			480			673			684	
Travel Time (s)		12.6			10.9			11.5			11.7	
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
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	204	1	3	0	0	0	0	893	270	77	1179	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	205	3	0	0	0	0	1163	0	77	1179	0
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					12.0		12.0	12.0	
Minimum Split (s)	16.0	16.0	16.0					18.0		18.0	18.0	
Total Split (s)	29.0	29.0	29.0					61.0		61.0	61.0	
Total Split (%)	32.2%	32.2%	32.2%					67.8%		67.8%	67.8%	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0					6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None					C-Max		C-Max	C-Max	
Act Effct Green (s)		15.6	15.6					62.4		62.4	62.4	
Actuated g/C Ratio		0.17	0.17					0.69		0.69	0.69	
v/c Ratio		0.67	0.01					0.34		0.27	0.33	
Control Delay		44.9	27.7					6.0		8.1	4.9	
Queue Delay		0.0	0.0					0.0		0.0	0.0	
Total Delay		44.9	27.7					6.0		8.1	4.9	
LOS		D	C					A		A	A	
Approach Delay		44.6						6.0			5.1	
Approach LOS		D						A			A	
Queue Length 50th (ft)		110	1					79		15	82	
Queue Length 95th (ft)		169	8					m146		22	72	

Year 2032 Total Weekday Sat Peak Hour Traffic Analysis - Signal
 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		475			400			593			604	
Turn Bay Length (ft)			100							115		
Base Capacity (vph)		453	404					3401		287	3524	
Starvation Cap Reductn		0	0					0		0	0	
Spillback Cap Reductn		0	0					0		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.45	0.01					0.34		0.27	0.33	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 11 (12%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 8.6
 Intersection LOS: A
 Intersection Capacity Utilization 65.7%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: 76th St & STH 36 NB Off Ramp/STH 36 NB On Ramp

p2 (R)	p4
61 s	29 s
p6 (R)	
61 s	