

TRANSPORTATION IMPACT STUDY

806 KILLALY STREET EAST

**CITY OF PORT COLBORNE
REGION OF NIAGARA**

PREPARED FOR:

ELITE M.D. DEVELOPMENTS LTD.

PREPARED BY:

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CFCA FILE NO. 2578-6905

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Revision Number	Date	Comments
Rev.0	December 2023	Issued for Submission

Executive Summary

Elite M.D. Developments Ltd. retained C.F. Crozier & Associates Inc. to prepare a Transportation Impact Study in support of Zoning By-Law Amendment and Secondary Plan application related to the proposed mixed-use development at 806 Killaly Street East in the City of Port Colborne, Niagara Region.

The analysis undertaken herein was completed using the Draft Master Plan dated June 01, 2023, envisioning 1,027 single detached units, 1,275 single attached units and approximately 6,250 square metres of commercial area. The timing for each phase is yet to be determined and the analysis contained examines the full build-out of the development.

It was found that the unsignalized intersections currently operate well with a Level of Service "B" or better in all the peak hours and the approaches at the signalized intersection of Highway 140/Elizabeth Street and Main Street operate with a Level of Service "C" or better with minimal delays and well under capacity.

A quarry expansion was identified as a part of the future background development and has been included in the analysis. A compounded growth rate of 2.5% was applied to the existing volumes on the Main Street (Highway 3) and 1.7% was applied to the existing volumes on southbound approach at the intersection of Highway 140/Elizabeth Street and Main Street to grow existing volumes to the year 2031, 2036 and 2041 respectively.

Under 2031, 2036 and 2041 future background conditions, the study intersections are expected to operate with a Level of Service "C" or better with minimal delays and well under capacity. However, the eastbound left-turn movement at the intersection of Highway 140/Elizabeth Street and Main Street is expected to deteriorate to a Level of Service "D" in the Weekday P.M. peak hour in 2031 and 2036 future background horizons with a volume-to-capacity ratio of 0.81 and 0.89 respectively. The Level of Service is expected to further deteriorate to "F" and movements are anticipated to be over capacity with a volume-to-capacity ratio of 1.02 in the 2041 future background horizon.

The subject site is expected to generate a total of 1332 (369 inbound and 963 outbound) net new two-way trips during the weekday A.M. peak hour, 1730 (1043 inbound and 687 outbound) net new two-way trips during the weekday P.M. peak hour, and 1756 (914 inbound and 842 outbound) net new two-way trips during the weekend peak hour.

Under 2031 future total conditions, the unsignalized intersections are expected to operate with a Level of Service "C" or better with minimal delays and well under capacity. However, the Level of Service for the northbound approach at the intersection of Main Street and Snider Road is expected to deteriorate to "F" in all the peak hours with a minimum volume-to-capacity ratio of 0.88. The southbound shared left/through/right movement is expected to deteriorate to a Level of Service "F" in the Weekday A.M. and Weekend peak hours with minor increase in delays.

The overall Level of Service for the intersection of Highway 140/Elizabeth Street and Main Street is expected to deteriorate to "F" and "C" in the Weekday P.M. and Weekend peak hours respectively. The northbound left and southbound left movement are expected to deteriorate to Level of Service "F" and southbound through movement is expected to deteriorate to Level of Service "E" in the Weekday P.M. peak hour with a volume-to-capacity ratio of a least 0.94. The southbound left-turn 95th percentile queue lengths are expected to exceed the available storage length during the Weekday P.M. peak hour.

Under 2036 future total conditions, the unsignalized intersections are forecasted to operate similarly to the 2031 future total conditions. The volume-to-capacity ratio for the northbound shared left/through/right movement at Main Street and Snider Road is expected to further increase in comparison to the 2031 future total conditions.

The overall Level of Service is expected to remain similar to the 2031 future total conditions for the intersection of Highway 140/Elizabeth Street and Main Street. The eastbound left and southbound left movements are expected to deteriorate to Level of Service "E" in the Weekend peak hour in addition to the 2031 future total conditions.

Under 2041 future total conditions, the unsignalized intersections are expected to operate similar to the 2036 future total conditions. The northbound shared left/through/right movement at Main Street and Snider Road is further expected to deteriorate with increasing delays and volume-to-capacity ratio.

The overall volume-to-capacity ratios at the signalized intersection Highway 140/Elizabeth Street and Main Street are expected to increase in all peak hours due to the background traffic growth rates. In addition, the northbound left movement is expected to deteriorate to Level of Service "F" with a volume-to-capacity ratio of 1.10 and 0.98 in the Weekday P.M. and Weekend peak hours respectively.

To further improve the intersection operations, the following recommendations are proposed for the study road network:

Horizon Year	Intersection/Segment	Improvements
2031	Highway 140/ Elizabeth Street and Main Street	<ul style="list-style-type: none"> Signal Optimization Implement dual southbound left-turn lanes with protected left phase
	Main Street and Snider Road	<ul style="list-style-type: none"> Signalize intersection Implement eastbound right-turn auxiliary lane with 60 metre storage and 55 metre taper
	Killaly Street and Elizabeth Street	<ul style="list-style-type: none"> Implement All-Way Stop Control

After optimizing the signal timings at the intersection of Highway 140/Elizabeth Street and Main Street, significant improvements in overall operations are anticipated. The volume-to-capacity ratios are expected to decrease, with the observed maximum ratio of 0.99 for the eastbound left-turn during the Weekday P.M. peak hour. Moreover, there's an expected 50% reduction in the 95th percentile queue length for the southbound left-turn lane during the Weekday P.M. peak hour.

Additionally, the intersections of Main Street and Snider Street, as well as Killaly Street and Elizabeth Street, are projected to operate smoothly with minimal delays, considering the provided recommendations.

As per the City of Port Colborne's Comprehensive Zoning By-Law 6575/30/18, April 2081, Section 03, single-detached, attached townhouse dwellings require one parking spaces per dwelling unit and the commercial blocks require a minimum of one space per 25 square metres GFA. The subject development is anticipated to meet the residential and commercial parking supply, which would be confirmed as part of subsequent submissions.

Based on the review of the external road network, the proposed mixed-use development can be supported from a traffic operations perspective. Additional details related to site access and the internal road network will be provided as part of subsequent submissions to confirm the number, location and type of control for the proposed accesses and internal intersections.

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1.0 Introduction

Elite M.D. Developments Ltd. retained C.F. Crozier & Associates Inc. (Crozier) to complete a Transportation Impact Study to support a Secondary Plan and Zoning By-Law Amendment application for the proposed mixed-use residential development located at 806 Killaly Street in the City of Port Colborne, Niagara Region.

1.1 Development Lands

The proposed development currently consists of vacant lands and is generally bounded by Main Street East (Highway 3) to the north, Lorraine Road to the east, Killaly Street East to the south, and Elizabeth Street to the west. However, it is noted that an additional parcel is located southeast of the intersection of Killaly Street East and Snider Road.

Figure 1 includes the site location and area bounded by the proposed mixed-use development.

1.2 Development Proposal

Per the Draft Plan dated June 1, 2023, the proposed development consists of the following:

- 1,027 Single Detached Units;
- 1,215 Townhouse Units; and
- Approximately 6,250 m² of Commercial GFA

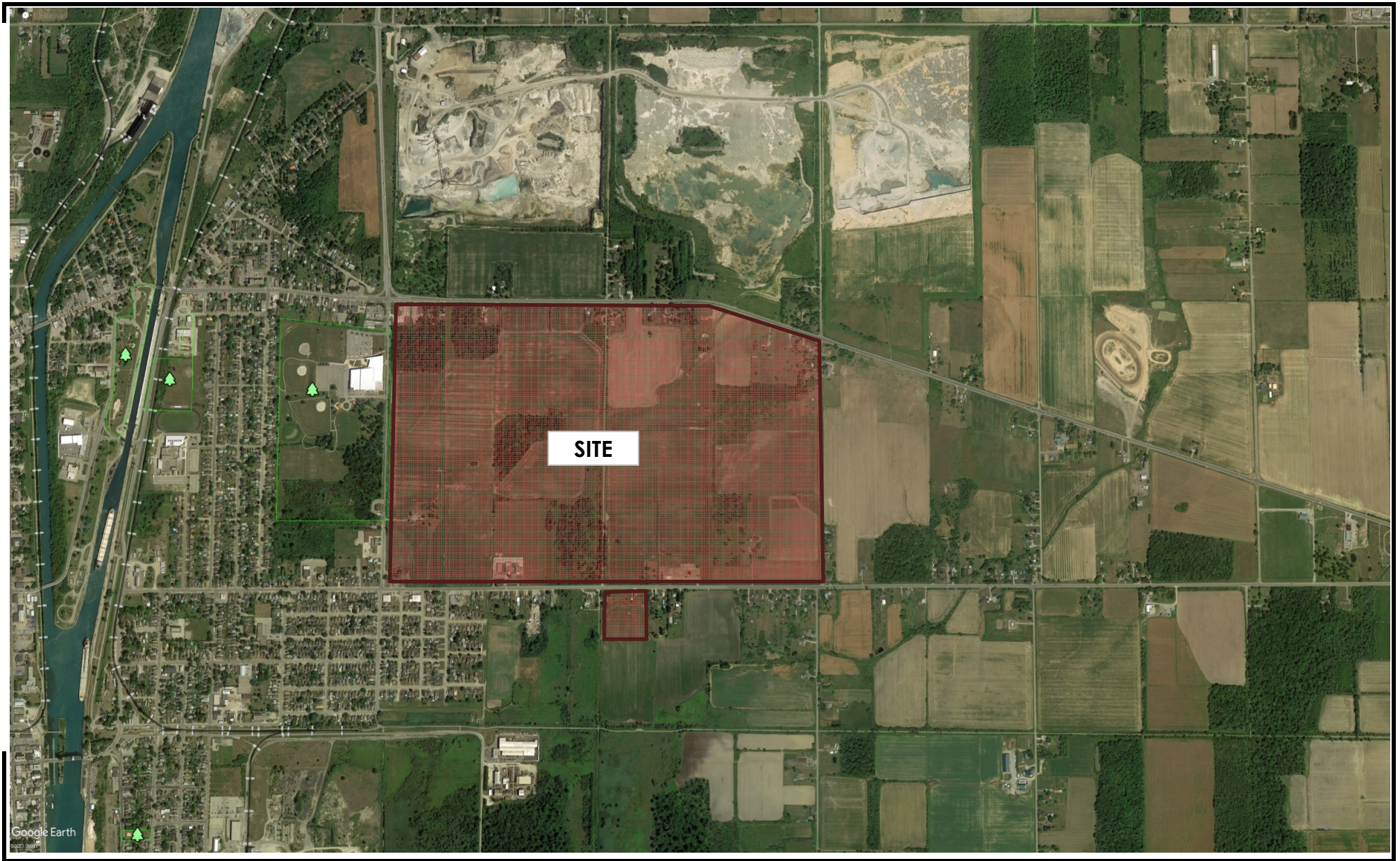
Additionally, it is noted that an existing Right-of-Way allowance to extend Snider Road passes through the proposed development but is not actively used for public traffic given it has not been constructed.

It is expected that this allowance would be used to extend Snider Road between Main Street (Highway 3) and Killaly Street East as part of the proposed development and is therefore included in the future horizon years of the Transportation Impact Study.

Furthermore, it should be noted that multiple accesses are currently shown via Killaly Street, Elizabeth Road, Lorraine Road, Main Street (Highway 3), and Snider Road. These accesses have not been assessed within this report and would be reviewed as part of future applications for the development.

Lastly, it is anticipated that the development plan will progress in phases, but the specific timing for each phase is yet to be determined. As a result, the analysis contained herein examines full build-out of the development only and further analyses for each phase would be conducted once the relevant phasing information becomes available.

Figure 2 outlines the current Draft Plan for the purposes of this application dated June 1, 2023.



Legend



SITE

806 Killaly Street East

SITE LOCATION



Figure 1

Project No. 2578-6905
 Date. 12.15.2023
 Analyst. Aarzo D

UNIT COUNT - PART 1		UNITS
SINGLE DETACHED 13.7m (45')		8
SINGLE DETACHED 12.2m (40')		141
SINGLE DETACHED 10.7m (35')		172
SINGLE DETACHED 9.15m (30')		125
LANE BASED TOWNHOUSE 8m (26')		139
LANE BASED TOWNHOUSE 6.1m (20')		25
STREET TOWNHOUSE 8m (26')		84
STREET TOWNHOUSE 6.1m (20')		92
CONDOMINIUM TOWNHOUSE 6.5m (21')		220
TOTAL UNITS		1006
COMMERCIAL		2.50ha

UNIT COUNT - PART 5		UNITS
SINGLE DETACHED 13.7m (45')		0
SINGLE DETACHED 12.2m (40')		54
SINGLE DETACHED 10.7m (35')		0
SINGLE DETACHED 9.15m (30')		0
LANE BASED TOWNHOUSE 8m (26')		12
LANE BASED TOWNHOUSE 6.1m (20')		0
STREET TOWNHOUSE 8m (26')		0
STREET TOWNHOUSE 6.1m (20')		0
CONDOMINIUM TOWNHOUSE 6.5m (21')		48
TOTAL UNITS		114
COMMERCIAL		2.43ha

UNIT COUNT - PART 2		UNITS
SINGLE DETACHED 13.7m (45')		17
SINGLE DETACHED 12.2m (40')		128
SINGLE DETACHED 10.7m (35')		217
SINGLE DETACHED 9.15m (30')		78
LANE BASED TOWNHOUSE 8m (26')		68
LANE BASED TOWNHOUSE 6.1m (20')		73
STREET TOWNHOUSE 8m (26')		34
STREET TOWNHOUSE 6.1m (20')		32
CONDOMINIUM TOWNHOUSE 6.5m (21')		204
TOTAL UNITS		851
COMMERCIAL		2.43ha

LEGEND

- - - Study Area
- Commercial
- Parkland
- Significant Woodlands w/ 10m Buffer
- Non-PSW Wetlands w/ 30m Buffer
- Rare Vegetation Community
- 15m Municipal Drain Important/Marginal Fish Habitat Buffer
- Municipal Drain Important/Marginal Fish Habitat Buffer
- NPCA Floodplain
- SWM Pond

DEVELOPMENT STATISTICS:

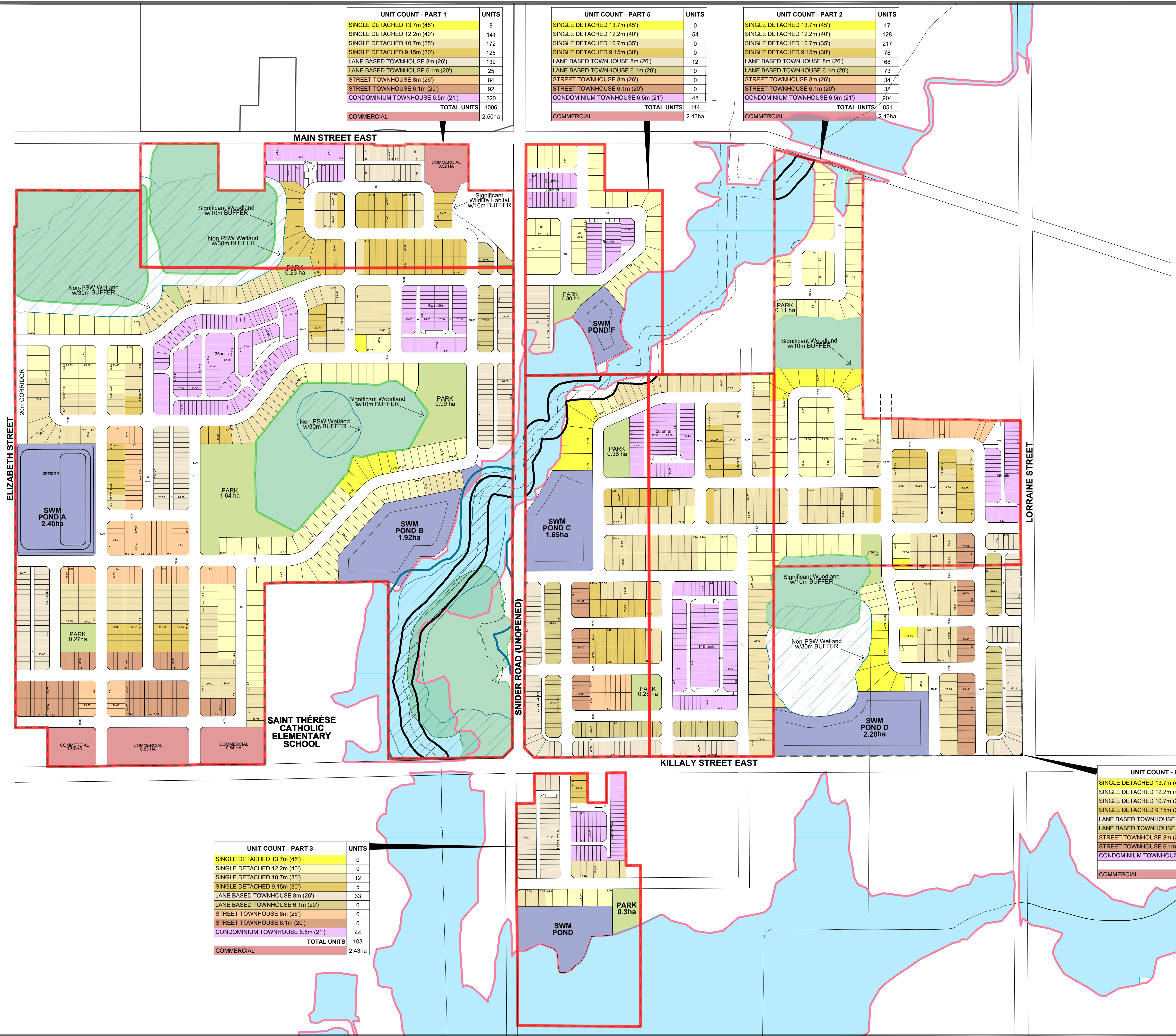
Gross Study Area:	142.27ha
Estimated Net Developable Area: (excluding SWM ponds & Regulated Areas)	99.68ha
Required Parkland: 1 ha per 300 units	7.30ha
Provided Parkland	4.69ha
Units per Net Hectare (2,242units/99.68ha)	22.49uph
SWM Pond:	8.90ha

UNIT COUNT	UNITS	%
SINGLE DETACHED 13.7m (45')	34	
SINGLE DETACHED 12.2m (40')	348	46%
SINGLE DETACHED 10.7m (35')	437	
SINGLE DETACHED 9.15m (30')	208	
LANE BASED TOWNHOUSE 8m (26')	289	19%
LANE BASED TOWNHOUSE 6.1m (20')	131	
STREET TOWNHOUSE 8m (26')	118	12%
STREET TOWNHOUSE 6.1m (20')	161	
CONDOMINIUM TOWNHOUSE 6.5m (21')	516	23%
TOTAL UNITS	2242	
COMMERCIAL	2.43ha	

Required Commercial GFA:	3,363m ²
150m ² per 100 unit	
Commercial Land Area:	25,000m ²
Estimated Commercial GFA (est. 25% coverage)	6,250m ²

UNIT COUNT - PART 3		UNITS
SINGLE DETACHED 13.7m (45')		0
SINGLE DETACHED 12.2m (40')		9
SINGLE DETACHED 10.7m (35')		12
SINGLE DETACHED 9.15m (30')		5
LANE BASED TOWNHOUSE 8m (26')		33
LANE BASED TOWNHOUSE 6.1m (20')		0
STREET TOWNHOUSE 8m (26')		0
STREET TOWNHOUSE 6.1m (20')		0
CONDOMINIUM TOWNHOUSE 6.5m (21')		44
TOTAL UNITS		103
COMMERCIAL		2.43ha

UNIT COUNT - PART 4		UNITS
SINGLE DETACHED 13.7m (45')		9
SINGLE DETACHED 12.2m (40')		16
SINGLE DETACHED 10.7m (35')		36
SINGLE DETACHED 9.15m (30')		0
LANE BASED TOWNHOUSE 8m (26')		37
LANE BASED TOWNHOUSE 6.1m (20')		33
STREET TOWNHOUSE 8m (26')		0
STREET TOWNHOUSE 6.1m (20')		37
CONDOMINIUM TOWNHOUSE 6.5m (21')		0
TOTAL UNITS		168
COMMERCIAL		2.43ha



1.3 Study Purpose and Scope

The purpose of the study is to evaluate the transportation-related impacts of the proposed development on the study road network and to recommend or confirm any required mitigation measures, if warranted.

The study reviews the following main aspects of the proposed development from a transportation engineering perspective:

- Impacts of the development traffic on the study road network through analyzing existing, future background, and future total traffic operations;
- The need for any external roadway improvements to mitigate traffic impacts;
- Parking Review per the City of Port Colborne's Zoning By-Law

The study has been completed in accordance with the Niagara Region's Transportation Impact Assessment Guidelines July 2023 and MTO's Traffic Impact Studies Guidelines March 2023, as well as the approved Terms of Reference.

Appendix A includes the Terms of Reference for the study, which was confirmed with Niagara Region staff through correspondence. It is noted that the Ministry of Transportation Ontario (MTO) is also aware of the development but could not provide a Terms of Reference at this time.

As confirmed in the Terms of Reference, this Transportation Impact Study considers the following study intersections:

- Highway 140/Elizabeth Street and Main Street East (Highway 3)
- Main Street East (Highway 3) and Snider Road
- Main Street East (Highway 3) and Lorraine Road/Babion Road
- Killaly Street and Lorraine Road
- Killaly Street and Snider Road
- Killaly Street and Elizabeth Road

It is noted that specific site accesses for the development via the internal road network were not reviewed and would be reviewed as part of future applications.

For the purposes of this study, it has been assumed that the entire development will be built out by 2031. The MTO's guidelines require analysis of the full build-out horizon and the five- and ten-year horizons from the estimated year of full build-out. Therefore, the 2031, 2036 and 2041 horizon years were analyzed.

2.0 Existing Conditions

This section outlines the current conditions of the transportation network in the vicinity of the proposed development. Details of the study road network, including traffic controls, lane configurations, speed limits, transit routes and stops, active transportation infrastructure and other relevant transportation elements are identified. The existing traffic operations are also summarized.

2.1 Study Road Network

The study road network consists of the existing road network near the subject site that is considered within this study, which includes the study intersections, and the adjoining roadway segments. **Table 1** delineates the study roadways.

It is also noted that the City of Port Colborne currently does not have any fixed transit routes and existing residents rely mostly on the use of automobiles for transportation. However, on January 3, 2022, Niagara Region and City of Port Colborne launched Niagara Region Transit OnDemand transit service in the City of Port Colborne, which does provide residents an alternative to private automobile use.

This transit service caters to the entirety of Port Colborne, addressing transportation needs across the City/Region, particularly benefiting residents without access to a private automobile in smaller, rural communities, which would typically have no transit options available.

The transit service operates Monday to Saturday between 7 a.m. and 10 p.m. and after reserving a ride, passengers are directed to a nearby stop location within walking to distance similar to a Transportation Network Company Service such as Uber.

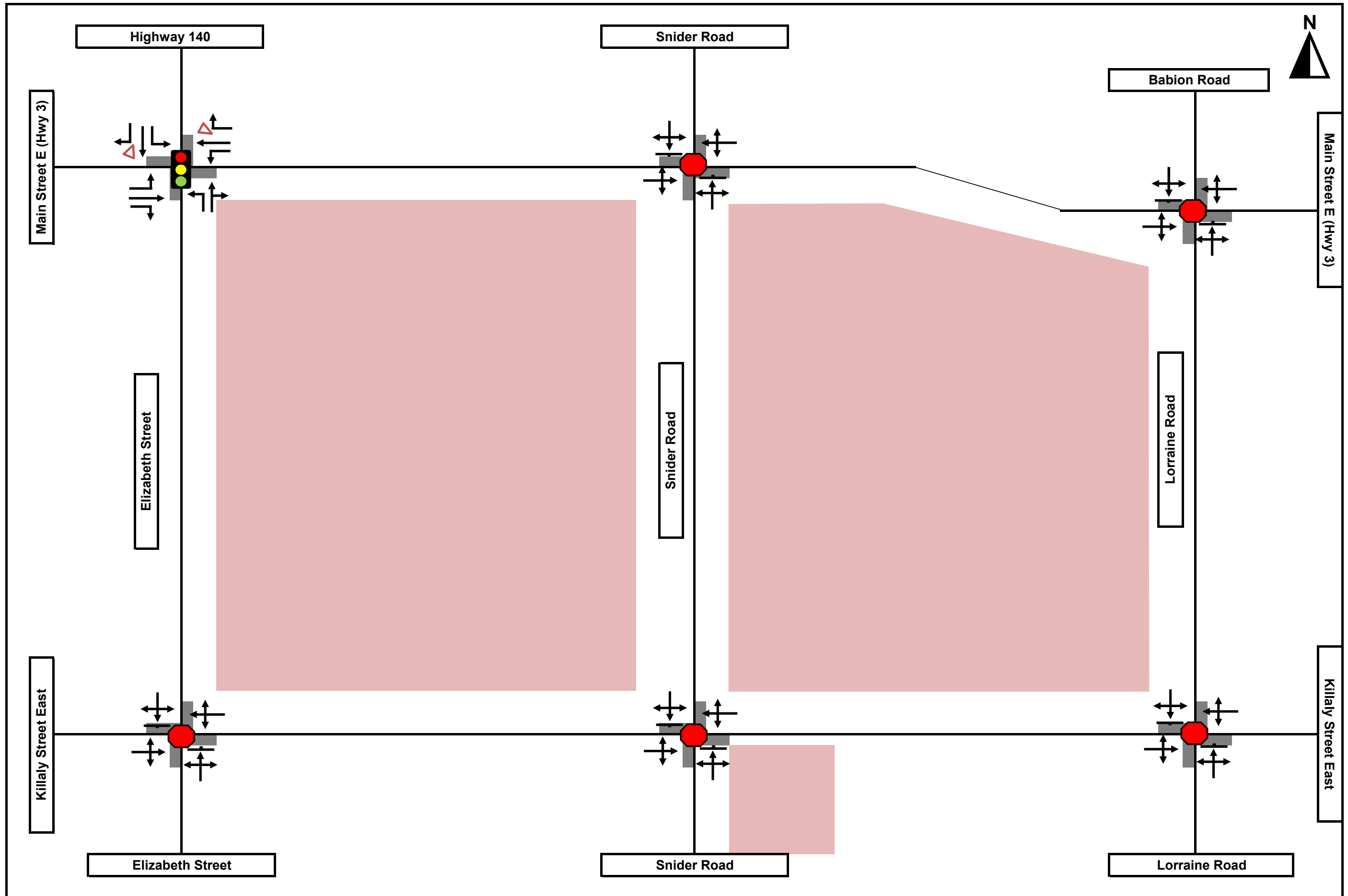
Figure 3 outlines the study road network.

Appendix B contains the City of Port Colborne's Official Plan excerpts.

Table 1: Study Roadways

Feature	Roadways				
	Elizabeth Street	Main Street East (Highway 3)	Killaly Street	Lorraine Road	Snider Road
Direction	Two-way (North-South)	Two-way (East-West)	Two-way (East-West)	Two-way (North-South)	Two-way (North-South)
Span	Main Street to Killaly Street	Elizabeth Street/Highway 140 to Lorraine Road/Babion Road	Elizabeth Street to Lorraine Road	Main Street to Killaly Street	Main Street to Killaly Street
Classification	Arterial	Arterial (Provincial)	Arterial	Local	To be determined
Jurisdiction	City of Port Colborne	MTO From East of Elizabeth Street	City of Port Colborne	City of Port Colborne	City of Port Colborne
Speed Limit	50 km/h from Main Street to Elizabeth Street Park 40 km/h from Elizabeth Street Park to Killaly Street	70 km/h from Elizabeth Street to Snider Road 80 km/h from Snider Road to Lorraine Road/Babion Road	50 km/h from Elizabeth Street to School Access 40 km/h from School Access to Snider Road 60 km/h from Snider Road to Lorraine Road	60 km/h ¹	To be determined
Number of travel lanes per direction	One	One	One	One	One
Active Transportation	~3m MUP on west side from Main Street to Elementary School and ~1.5 m sidewalk south of the elementary school	None	Sidewalk on north side up to Elizabeth Street and on south side terminating 175 m west of Snider Road	None	None

Note 1: A jurisdictional speed limit of 40 km/h is assumed on the roadways with no posted speed limit.



Legend	
xx	A.M. Peak Hour Traffic Volumes
{xx}	P.M. Peak Hour Traffic Volumes
{xx}	Weekend Peak Hour Traffic Volumes

806 Killaly Street East

Study Road Network



Figure 3

Project No. 2578-6905

Date: 12.15.2023

Analyst: Aarzo D

2.2 Transportation Data

The turning movement counts we conducted by a specialty firm at the study intersections to support the analysis of this study. **Table 2** summarizes the study intersections, date of data collection and signal timing plans, as well as the source of the information.

Traffic data was collected during the hours of 6:00 a.m. to 10:00 a.m. and 3:00 p.m. to 7:00 p.m.

Table 2: Traffic Data

Intersection	TMC Date	TMC Source	Timing Plan Date	Timing Plan Source
Highway 140/Elizabeth Street and Main Street (Highway 3)	Thursday, November 23, 2023, and Saturday, November 25, 2023	Spectrum	20 th October 2021	MTO
Main Street and Snider Road			N/A	
Main Street and Lorraine Road/Babion Road				
Killaly Street/Lorraine Road				
Killaly Street/Elizabeth Street				

It is noted that traffic counts were not conducted at the intersection of Killaly Street and Snider Road as there is not a significant amount of existing traffic at this intersection such that it would impact the results of the analysis.

Therefore, the intersection is not analyzed as part of existing and future background conditions.

Appendix C contains the traffic data used within this study.

2.3 Traffic Modelling and Assumptions

The existing traffic conditions on the study road network were modelled in Synchro 11 based on the “Highway Capacity Manual (HCM)” as agreed upon in terms of reference correspondence with Niagara Region.

It is also noted that a Term of Reference for the proposed development was previously submitted to the MTO in the year 2021 by EXP, which confirmed that a saturation flow rate of 1750 vehicles per hour per lane and a peak hour factor of 0.92 should be used. Therefore, these parameters were used in the preparation of the analyses contained herein.

Roadway geometrics were modelled based on the existing study road network description outlined in Section 2.1 and the traffic volumes applied to the existing conditions are per Section 2.2, based on the turning movement count survey data. This survey data was also used to calculate the heavy vehicle percentages for each movement.

The MTO's Transportation Impact Study Guidelines provide the following parameters indicating critical operations requiring mitigation measures:

- For signalized intersections,
 - A Level of Service "E" or worse
 - Volume-to-capacity (v/c) ratio of 0.85 or greater for through, shared turning and exclusive turning movements.
 - 95th percentile queues exceeding the available storage length.
- For stop-controlled intersections:
 - A Level of Service "D" or worse, or movement v/c ratios exceeding 0.85
 - 95th percentile queues exceeding the available storage length.

2.4 Intersection Operations

Table 4 outlines the 2023 existing conditions traffic operations at the signalized and unsignalized intersections in the study road network. Synchro 11 was used to determine intersection operations at both the signalized and unsignalized study intersections.

Figure 4 shows the 2023 existing traffic volumes at the study intersections.

Under 2023 existing conditions, the unsignalized intersections operate with a Level of Service "B" or better and the overall signalized intersection of Highway 140/Elizabeth Street and Main Street East operates with a Level of Service "B" or better with westbound through and eastbound left-turn movements operating with a Level of Service "C" in the Weekday A.M. and P.M. peak hours and weekend peak hours and eastbound through movement operating with a Level of Service "C" in the Weekday A.M. and P.M. peak hours with minimal delays and well under capacity.

As per **Table 4**, the 95th percentile queue length at the intersection of Highway 140/Elizabeth Street and Main Street East operates well under the available storage in the Weekday A.M. and P.M. peak hours and Weekend peak hour.

Appendix F contains the 2023 existing conditions detailed capacity analysis.

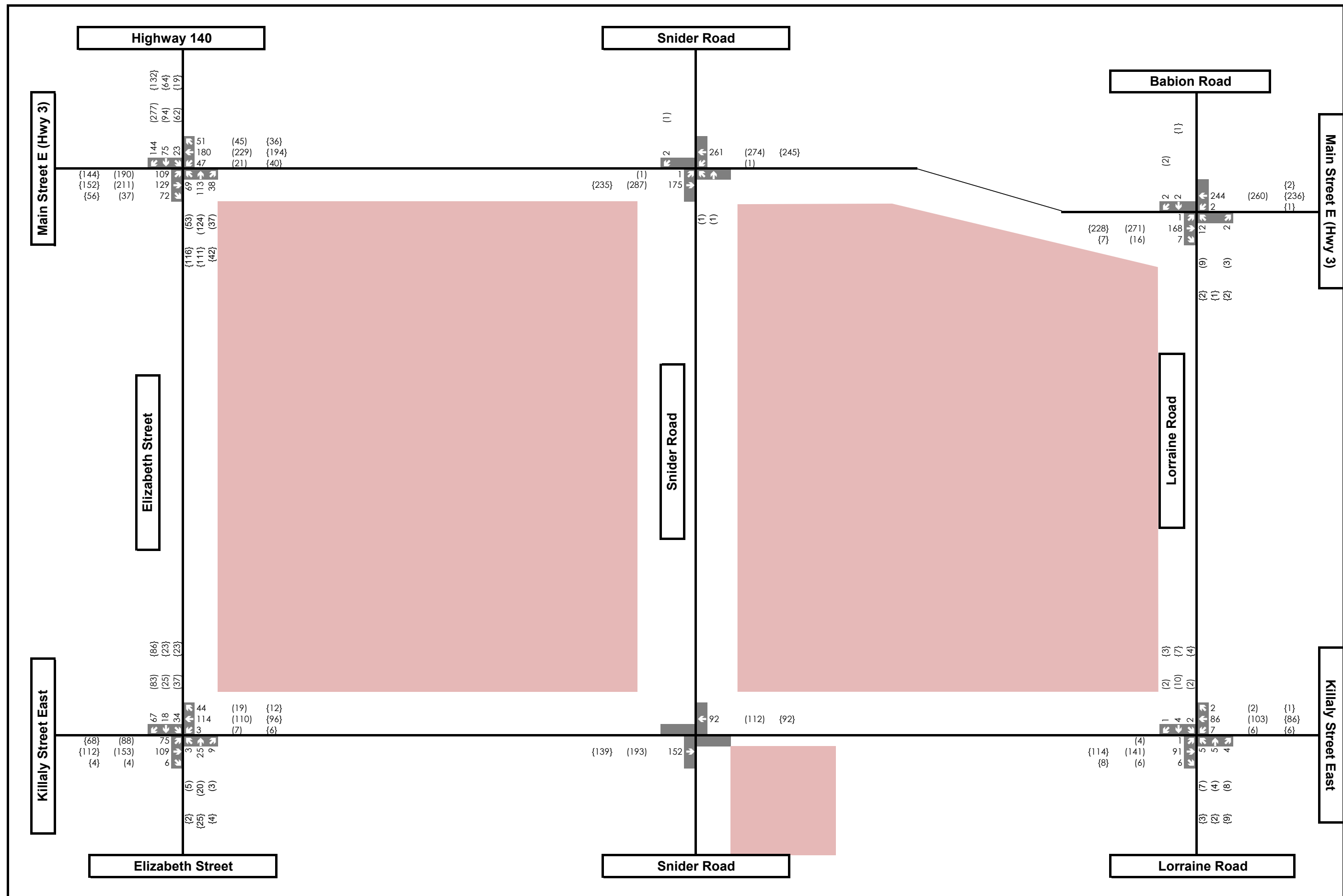


Table 3: 2023 Existing Conditions Traffic Operations

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Hwy 140/Elizabeth Street and Main Street (Signal)	Overall	B	B	B	14.1	15.7	14.5	0.50	0.67	0.53
	EBL	C	C	C	24.8	30.9	26.2	0.45	0.67	0.53
	EBT	C	C	B	20.8	20.8	19.6	0.34	0.46	0.32
	EBR	A	A	A	5.9	2.8	5.8	0.18	0.08	0.13
	WBL	B	B	B	18.7	15.0	17.5	0.17	0.07	0.12
	WBT	C	C	C	24.1	20.5	21.1	0.50	0.46	0.42
	WBR	A	A	A	5.8	3.8	3.2	0.13	0.10	0.08
	NBL	B	B	B	10.1	14.1	11.7	0.13	0.11	0.22
	NBTR	A	B	A	9.0	12.9	9.3	0.21	0.23	0.19
	SBL	A	B	B	9.6	14.5	10.3	0.05	0.14	0.04
	SBT	A	B	B	9.7	13.8	10.2	0.10	0.13	0.08
SBR	A	A	A	3.0	3.9	3.0	0.23	0.39	0.18	
Main Street and Snider Road (TWSC)	Overall	A	B	A	9.8	14.0	0.0	0.00	0.00	0.00
	EBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	A	B	A	0.0	14.0	0.0	0.00	0.00	0.00
	SBLTR	A	A	A	9.8	9.9	0.0	0.00	0.00	0.00
Main Street and Lorraine Road/Babion Road (TWSC)	Overall	B	B	B	11.8	12.8	12.8	0.03	0.03	0.01
	EBLT	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	EBR	A	A	A	0.0	0.0	0.0	0.00	0.01	0.00
	WBLT	A	A	A	0.1	0.0	0.0	0.00	0.00	0.00
	WBR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	B	B	B	11.8	12.8	11.4	0.03	0.03	0.01
	SBLTR	B	A	B	11.0	9.8	12.8	0.01	0.00	0.00
Killaly Street and Lorraine Road (TWSC)	Overall	B	B	B	10.0	10.7	10.1	0.02	0.03	0.02
	EBLTR	A	A	A	0.1	0.2	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.6	0.5	0.6	0.01	0.00	0.00
	NBLTR	A	B	A	9.8	10.1	9.4	0.02	0.03	0.02
	SBLTR	B	B	B	10.0	10.7	10.1	0.01	0.02	0.02

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Killaly Street and Elizabeth Road (TWSC)	Overall	B	B	B	12.4	14.0	12.3	0.20	0.26	0.20
	EBLTR	A	A	A	3.4	3.1	3.1	0.06	0.07	0.05
	WBLTR	A	A	A	0.1	0.5	0.5	0.00	0.01	0.00
	NBLTR	B	B	B	12.4	14.0	12.3	0.08	0.07	0.06
	SBLTR	B	B	B	12.1	12.9	11.2	0.20	0.26	0.20

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).

Note 2: All v/c ratios greater than 0.85 are bolded and greater than 1.00 are bolded with red text.

The critical v/c threshold for intersections with Regional Roads and provincial Roads (Highway 140 & Highway 3) is 0.85 for all movements per Niagara Region and MTO guidelines..

Table 4: 2023 Existing Conditions Queuing Assessment

Intersection	Performance Metrics				
	Movement	95 th Percentile Queue Length (m) [50 th Percentile Queue Length (m)]			Auxiliary Lane Storage Length (m)
		AM	PM	SAT	
Hwy 140/Elizabeth Street and Main Street (Signal)	EBL	25 [10]	45 [25]	30 [15]	115
	EBR	10 [0]	5 [0]	5 [0]	110
	WBL	10 [5]	5 [0]	10 [5]	100
	WBR	5 [0]	5 [0]	5 [0]	30
	NBL	15 [5]	15 [5]	20 [10]	100
	SBL	5 [0]	15 [5]	5 []	115
	SBR	10 [0]	15 [0]	10 [0]	25

3.0 Future Background Conditions

This section summarizes the future background conditions of the study road network and provides details relating to growth rates, future transportation network improvements, and background developments within the study area. As established in Section 1.3 (per the Terms of Reference), this study considers the 2031, 2036 and 2041 horizon years in the future background traffic analysis.

3.1 Future Transportation Network

As detailed in the Draft Plan, Snider Road is proposed to be extended through the development and constructed to Urban Standards. It is assumed within the study that Snider Road would be built by the full build-out year (2031) alongside the development.

However, this is not assumed to occur in the background conditions and no other transportation improvements were identified to be included in the background conditions assessment.

3.2 Growth Rates

The MTO's "Provincial Highways Traffic Volumes 1988-2019" document was reviewed to analyze historical traffic volumes on Highway 3. The document provides historical traffic data for the segment of Highway 3 between Barber Drive and Killaly Street East and Highway 140 beginning from the City of Port Colborne.

Based on a review of the historical data, an average annual compound growth rate of 2.5% was calculated along Main Street East (Highway 3) and 1.7% along Highway 140 between the years of 2010 and 2019.

These background growth rates were applied to all the horizon years for all through movements along the Highway 3 corridor except for at the intersection of Highway 3 and Highway 140 where the growth rates were applied to all eastbound, westbound, and southbound movements at the intersection.

Appendix E contains the growth rate analysis.

3.3 Background Developments

Staff at Niagara Region and the City of Port Colborne have identified the expansion plans for the Port Colborne Quarries on the north side of the subject site and provided the associated TIS prepared by IBI Group (now Arcadis). Consequently, these expansion plans have been incorporated into the background traffic for the purposes of this study.

Anticipated to progress in phases, the Quarries expansion site is expected to predominantly generate truck traffic, which is foreseen to remain consistent. To ensure a comprehensive synchro analysis, the truck volumes were transformed into equivalent passenger car volumes, thereby becoming integral to the background analysis.

Additionally, it is noted that distinct trip distribution analyses were carried out for the years 2031, 2036, and 2041 by IBI Group due to the changes in site accesses at the development and the changing site traffic was incorporated within the background analysis.

Appendix F contain the site trips generated by the development for the year 2031, 2036 and 2041 respectively.

3.4 2031 Intersection Operations

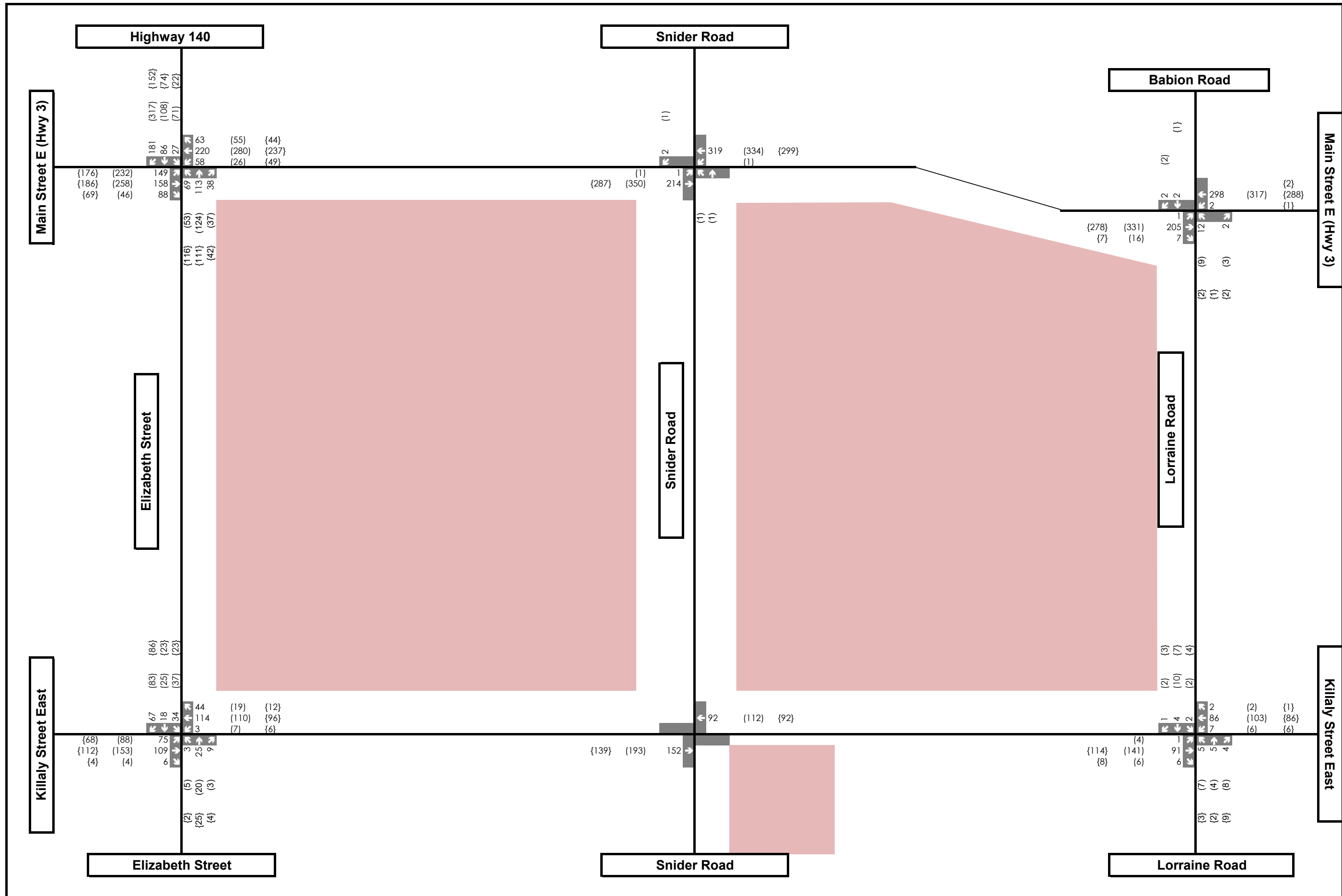
Table 5 outlines the 2031 future background conditions traffic operations at the signalized and unsignalized intersections. **Figure 5** shows the 2031 future background traffic volumes.

Under 2031 future background conditions, the unsignalized intersections operate with a Level of Service "B" or better similarly to the 2023 existing conditions, except for the northbound shared left/through/right movement at Main Street and Snider Road, which is expected to operate at a Level of Service "C". These intersections are anticipated to operate with minimal delays and well below capacity."

The signalized intersection at Highway 140/Elizabeth Street and Main Street East operates similarly to the existing conditions in 2023, maintaining an overall Level of Service of "B" or better with minimal delays and well under capacity. However, the Level of Service for the eastbound-left approach in the weekday P.M. peak hour is expected to deteriorate to "D," with an increase in delay of at least 10.3 seconds and an expected rise in the volume-to-capacity ratio from 0.67 to 0.81.

As per **Table 6**, the 95th percentile queue length at the intersection of Highway 140/Elizabeth Street and Main Street East is expected to operate well under the available storage in the Weekday A.M. and P.M. peak hours and Weekend peak hour similar to the 2023 existing conditions.

Appendix G contains the 2031 future background conditions detailed capacity analysis.



Legend	
xx	A.M. Peak Hour Traffic Volumes
{xx}	P.M. Peak Hour Traffic Volumes
{xx}	Weekend Peak Hour Traffic Volumes

806 Killaly Street East
2031 Future Background Traffic Volumes



Figure 5
 Project No. 2578-6905
 Date: 12.15.2023
 Analyst: Aarzo D

Table 5: 2031 Future Background Traffic Operations

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Hwy 140/Elizabeth Street and Main Street (Signal)	Overall	B	B	B	15.1	18.0	15.0	0.57	0.81	0.56
	EBL	C	D	C	26.8	41.2	27.5	0.53	0.81	0.56
	EBT	C	C	B	20.9	20.6	19.8	0.39	0.50	0.34
	EBR	A	A	A	5.3	3.7	5.7	0.21	0.09	0.14
	WBL	B	B	B	18.4	14.3	17.3	0.20	0.08	0.13
	WBT	C	C	C	25.1	20.2	21.4	0.57	0.50	0.44
	WBR	A	A	A	5.6	4.4	3.1	0.16	0.10	0.08
	NBL	B	B	B	11.5	16.3	12.3	0.13	0.12	0.22
	NBTR	B	B	A	10.1	15.0	10.0	0.21	0.25	0.21
	SBL	B	B	B	11.0	16.9	11.0	0.06	0.17	0.04
	SBT	B	B	B	11.0	16.2	10.9	0.11	0.16	0.09
SBR	A	A	A	3.4	4.3	3.3	0.26	0.45	0.20	
Main Street and Snider Road (TWSC)	Overall	B	C	A	10.2	15.9	0.0	0.00	0.01	0.01
	EBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	A	C	A	0.0	15.9	0.0	0.00	0.01	0.01
	SBLTR	B	B	A	10.2	10.3	0.0	0.00	0.00	0.00
Main Street and Lorraine Road/Babion Road (TWSC)	Overall	B	B	B	12.9	14.4	12.8	0.03	0.03	0.01
	EBLT	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	EBR	A	A	A	0.0	0.0	0.0	0.00	0.01	0.00
	WBLT	A	A	A	0.1	0.0	0.0	0.00	0.00	0.00
	WBR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	B	B	B	12.9	14.4	11.4	0.03	0.03	0.01
	SBLTR	B	B	B	11.7	10.2	12.8	0.01	0.00	0.00
Killaly Street and Lorraine Road (TWSC)	Overall	B	B	B	10.0	10.7	10.1	0.02	0.03	0.02
	EBLTR	A	A	A	0.1	0.2	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.6	0.5	0.6	0.01	0.00	0.00
	NBLTR	A	B	A	9.8	10.1	9.4	0.02	0.03	0.02
	SBLTR	B	B	B	10.0	10.7	10.1	0.01	0.02	0.02

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Killaly Street and Elizabeth Road (TWSC)	Overall	B	B	B	12.4	14.0	12.3	0.20	0.26	0.20
	EBLTR	A	A	A	3.4	3.1	3.1	0.06	0.07	0.05
	WBLTR	A	A	A	0.1	0.5	0.5	0.00	0.01	0.00
	NBLTR	B	B	B	12.4	14.0	12.3	0.08	0.07	0.06
	SBLTR	B	B	B	12.1	12.9	11.2	0.20	0.26	0.20

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).

Note 2: All v/c ratios of 0.85 and greater than 0.85 are bolded and greater than 1.00 are bolded with red text.

The critical v/c threshold for intersections with Regional Roads and provincial Roads (Highway 140 & Highway 3) is 0.85 for all movements per MTO guidelines.

Table 6: 2031 Future Background Conditions Queuing Assessment

Intersection	Performance Metrics				Auxiliary Lane Storage Length (m)
	Movement	95 th Percentile Queue Length (m) [50 th Percentile Queue Length (m)]			
		AM	PM	SAT	
Hwy 140/Elizabeth Street and Main Street (Signal)	EBL	30 [15]	65 [30]	35 [15]	115
	EBR	10 [0]	5 [0]	5 [0]	110
	WBL	15 [5]	5 [5]	10 [5]	100
	WBR	10 [0]	5 [0]	5 [0]	30
	NBL	15 [5]	15 [5]	20 [10]	100
	SBL	5 [0]	20 [5]	5 [0]	115
	SBR	10 [0]	15 [0]	10 [0]	25

3.5 2036 Intersection Operations

Table 7 outlines the 2036 future background conditions traffic operations at the signalized and unsignalized intersections. **Figure 6** shows the 2036 future background traffic volumes.

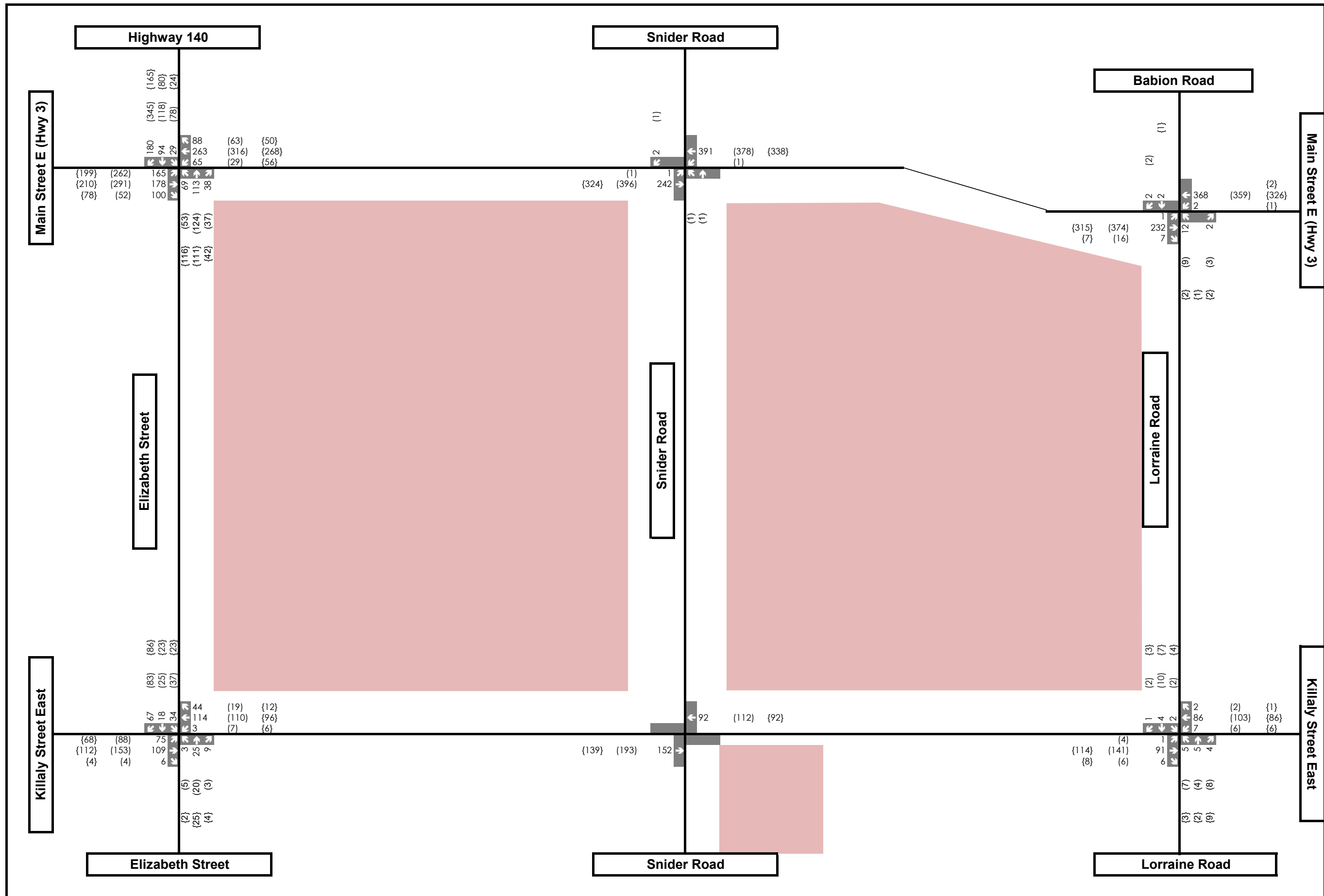
Under 2036 future background conditions, the unsignalized intersections operate similarly to the 2031 future background conditions, with a Level of Service "C" or better with minimal delays and well under capacity.

The signalized intersection at Highway 140/Elizabeth Street and Main Street East operates similarly to the 2031 future background conditions, maintaining an overall Level of Service of "B" or better in the weekday A.M. and weekend peak hours, except for the P.M. peak hour, which experiences a Level of Service "C" with minimal delays and well under capacity. Further, the volume-to-capacity ratio for the eastbound left-turn movement is expected to increase from 0.81 to 0.89 with an increase in delay of 11.4 seconds.

As per **Table 8**, the 95th percentile queue length at the intersection of Highway 140/Elizabeth Street and Main Street East is expected to operate well under the available storage in the Weekday A.M. and P.M. peak hours and Weekend peak hour similar to the 2031 future background conditions.

The 95th percentile queue length for eastbound left-turn lane is forecasted to increase by approximately 20 meters in the weekday P.M. peak hour. However, it is expected to operate well under available storage of 115 meters.

Appendix H contains the 2036 future background conditions detailed capacity analysis.



Legend	
xx	A.M. Peak Hour Traffic Volumes
{xx}	P.M. Peak Hour Traffic Volumes
{xx}	Weekend Peak Hour Traffic Volumes

806 Killaly Street East
2036 Future Background Traffic Volumes



Figure 6	
Project No. 2578-6905	
Date. 12.15.2023	
Analyst. Aarzo D	

Table 7: 2036 Future Background Traffic Operations

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Hwy 140/Elizabeth Street and Main Street (Signal)	Overall	B	C	B	16.2	20.0	17.1	0.65	0.89	0.72
	EBL	C	D	C	31.0	52.6	34.4	0.65	0.89	0.72
	EBT	C	C	B	20.1	20.2	19.0	0.40	0.51	0.40
	EBR	A	A	A	1.5	1.2	4.4	0.21	0.10	0.16
	WBL	B	B	B	17.6	14.2	16.2	0.21	0.09	0.17
	WBT	C	B	C	25.6	19.8	21.1	0.62	0.51	0.51
	WBR	A	A	A	4.7	4.2	4.2	0.19	0.11	0.10
	NBL	B	B	B	13.6	17.4	16.1	0.14	0.13	0.24
	NBTR	B	B	B	11.8	16.2	13.0	0.22	0.26	0.23
	SBL	B	B	B	13.2	18.4	14.7	0.07	0.20	0.05
	SBT	B	B	B	13.1	17.5	14.5	0.13	0.19	0.12
SBR	A	A	A	3.8	4.6	4.0	0.29	0.49	0.26	
Main Street and Snider Road (TWSC)	Overall	B	C	A	10.7	17.5	0.0	0.00	0.01	0.01
	EBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	A	C	A	0.0	17.5	0.0	0.00	0.01	0.01
	SBLTR	B	B	A	10.7	10.6	0.0	0.00	0.00	0.00
Main Street and Lorraine Road/Babion Road (TWSC)	Overall	B	C	C	14.3	15.8	15.0	0.04	0.04	0.01
	EBLT	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	EBR	A	A	A	0.0	0.0	0.0	0.00	0.01	0.00
	WBLT	A	A	A	0.1	0.0	0.0	0.00	0.00	0.00
	WBR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	B	C	B	14.3	15.8	13.2	0.04	0.04	0.01
SBLTR	B	B	C	12.6	10.5	15.0	0.01	0.00	0.00	
Killaly Street and Lorraine Road (TWSC)	Overall	B	B	B	10.0	10.7	10.1	0.02	0.03	0.02
	EBLTR	A	A	A	0.1	0.2	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.6	0.5	0.6	0.01	0.00	0.00
	NBLTR	A	B	A	9.8	10.1	9.4	0.02	0.03	0.02
	SBLTR	B	B	B	10.0	10.7	10.1	0.01	0.02	0.02

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Killaly Street and Elizabeth Road (TWSC)	Overall	B	B	B	12.4	14.0	12.3	0.20	0.26	0.20
	EBLTR	A	A	A	3.4	3.1	3.1	0.06	0.07	0.05
	WBLTR	A	A	A	0.1	0.5	0.5	0.00	0.01	0.00
	NBLTR	B	B	B	12.4	14.0	12.3	0.08	0.07	0.06
	SBLTR	B	B	B	12.1	12.9	11.2	0.20	0.26	0.20

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).

Note 2: All v/ c ratios of 0.85 and greater than 0.85 are bolded and greater than 1.00 are bolded with red text.

The critical v/c threshold for intersections with Regional Roads and provincial Roads (Highway 140 & Highway 3) is 0.85 for all movements per Niagara Region and MTO guidelines.

Table 8: 2036 Future Background Conditions Queueing Assessment

Intersection	Performance Metrics				
	Movement	95 th Percentile Queue Length (m) [50 th Percentile Queue Length (m)]			Auxiliary Lane Storage Length (m)
		AM	PM	SAT	
Hwy 140/Elizabeth Street and Main Street (Signal)	EBL	40 [20]	85 [40]	50 [25]	115
	EBR	10 [0]	5 [0]	10 [0]	110
	WBL	15 [0]	10 [5]	15 [5]	100
	WBR	10 [0]	5 [0]	5 [0]	30
	NBL	30 [10]	15 [5]	30 [10]	100
	SBL	10 [0]	20 [10]	10 [0]	115
	SBR	15 [0]	15 [0]	10 [0]	25

3.6 2041 Intersections Operation

Table 9 outlines the 2041 future background conditions traffic operations at the signalized and unsignalized intersections. **Figure 7** shows the 2041 future background traffic volumes.

Under 2041 future background conditions, the unsignalized intersections operate with a Level of Service "C" or better similarly to the 2031 future background conditions with minimal delays and well under capacity.

The signalized intersection at Highway 140/Elizabeth Street and Main Street East operates similarly to the 2031 future background conditions, maintaining an overall Level of Service of "B" or better in the weekday A.M. and weekend peak hours and an overall Level of Service "C" in the weekday P.M. peak hour with minimal delays and well under capacity. However, the Level of Service for eastbound left-turn movement is expected to deteriorate to "F" in the weekday P.M. peak hour with volume-to-capacity ratio forecasted to increase from 0.81 to 1.02 resulting from an increase in delay of 40.7 seconds.

As per **Table 10**, the 95th percentile queue length at the intersection of Highway 140/Elizabeth Street and Main Street East is expected to operate well under the available storage in the Weekday A.M. and P.M. peak hours and Weekend peak hour similar to the 2036 future background conditions.

The 95th percentile queue length for eastbound left-turn lane is forecasted to increase by approximately 20 meters in the weekday P.M. peak hour compared to the 2036 future background conditions. However, it is expected to operate well under available storage of 115 meters.

Appendix I contains the 2041 future background conditions detailed capacity analysis.

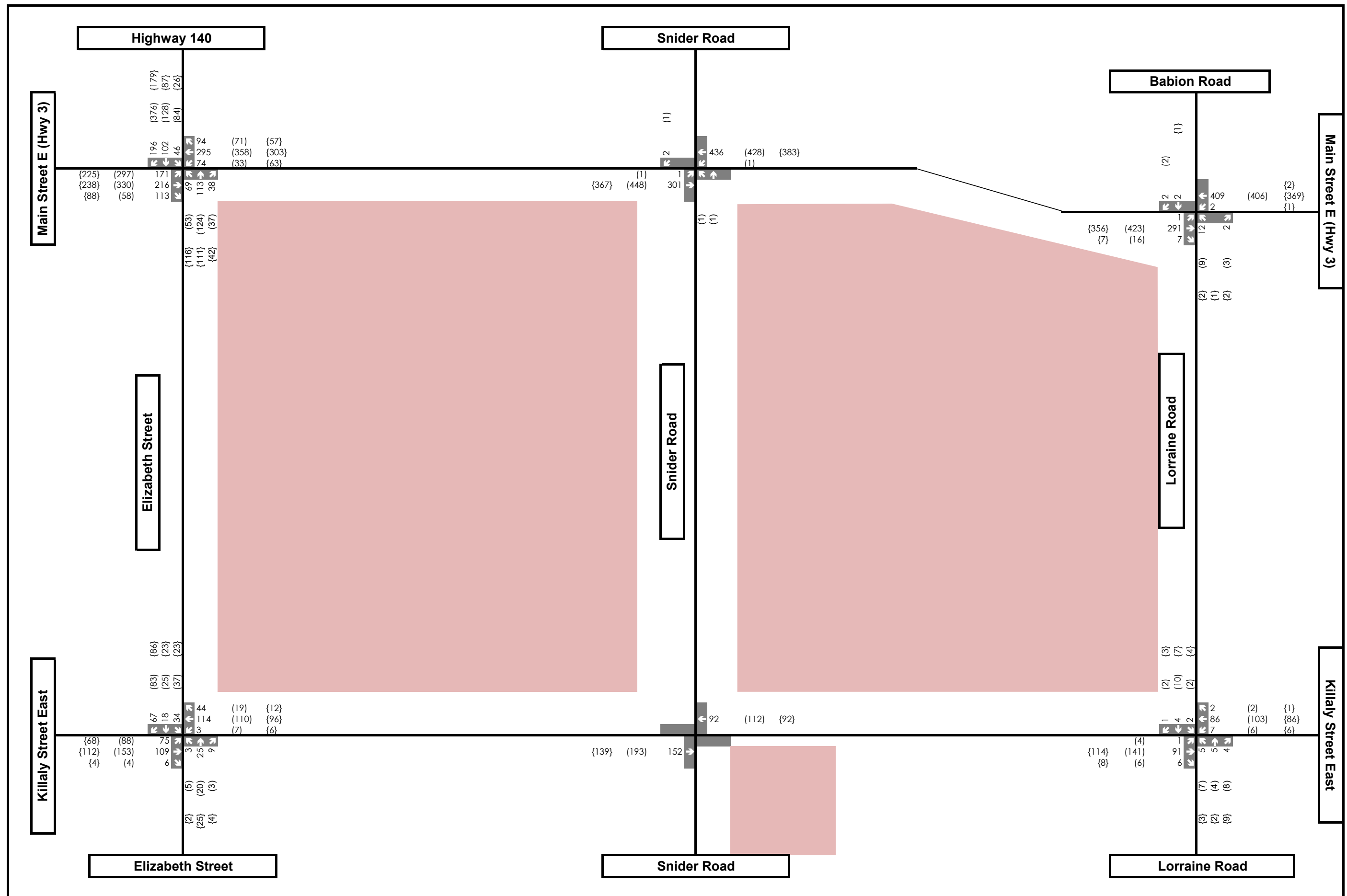


Table 9: 2041 Future Background Traffic Operations

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Hwy 140/Elizabeth Street and Main Street (Signal)	Overall	B	C	B	17.0	25.5	19.0	0.69	1.02	0.83
	EBL	C	F	D	33.6	81.9	44.2	0.69	1.02	0.83
	EBT	C	C	B	20.6	20.4	18.6	0.46	0.54	0.42
	EBR	A	A	A	4.2	4.3	4.1	0.22	0.10	0.17
	WBL	B	B	B	17.3	14.3	15.7	0.23	0.10	0.18
	WBT	C	B	C	26.1	19.9	20.9	0.66	0.53	0.53
	WBR	A	A	A	4.3	4.2	4.4	0.20	0.11	0.11
	NBL	B	B	B	14.9	17.8	17.9	0.14	0.14	0.25
	NBTR	B	B	B	13.0	16.9	14.4	0.23	0.28	0.24
	SBL	B	B	B	14.7	19.0	16.0	0.11	0.22	0.06
	SBT	B	B	B	14.3	18.3	16.2	0.15	0.22	0.13
SBR	A	A	A	4.1	7.4	4.1	0.32	0.57	0.29	
Main Street and Snider Road (TWSC)	Overall	B	C	A	11.1	19.7	0.0	0.00	0.01	0.01
	EBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	A	C	A	0.0	19.7	0.0	0.00	0.01	0.01
	SBLTR	B	B	A	11.1	11.0	0.0	0.00	0.00	0.00
Main Street and Lorraine Road/Babion Road (TWSC)	Overall	C	C	C	16.0	17.6	16.3	0.04	0.04	0.01
	EBLT	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	EBR	A	A	A	0.0	0.0	0.0	0.00	0.01	0.00
	WBLT	A	A	A	0.1	0.0	0.0	0.00	0.00	0.00
	WBR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	C	C	B	16.0	17.6	14.2	0.04	0.04	0.01
	SBLTR	B	B	C	13.5	10.8	16.3	0.01	0.00	0.00
Killaly Street and Lorraine Road (TWSC)	Overall	B	B	B	10.0	10.7	10.1	0.02	0.03	0.02
	EBLTR	A	A	A	0.1	0.2	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.6	0.5	0.6	0.01	0.00	0.00
	NBLTR	A	B	A	9.8	10.1	9.4	0.02	0.03	0.02
	SBLTR	B	B	B	10.0	10.7	10.1	0.01	0.02	0.02

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Killaly Street and Elizabeth Road (TWSC)	Overall	B	B	B	12.4	14.0	12.3	0.20	0.26	20
	EBLTR	A	A	A	3.4	3.1	3.1	0.06	0.07	0.05
	WBLTR	A	A	A	0.1	0.5	0.5	0.00	0.01	0.00
	NBLTR	B	B	B	12.4	14.0	12.3	0.08	0.07	0.06
	SBLTR	B	B	B	12.1	12.9	11.2	0.20	0.26	0.20

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).

Note 2: All v/c ratios of 0.85 and greater than 0.85 are bolded and greater than 1.00 are bolded with red text.

The critical v/c threshold for intersections with Regional Roads and provincial Roads (Highway 140 & Highway 3) is 0.85 for all movements per Niagara Region and MTO guidelines.

Table 10: 2041 Future Background Conditions Queuing Assessment

Intersection	Performance Metrics				
	Movement	95 th Percentile Queue Length (m) [50 th Percentile Queue Length (m)]			Auxiliary Lane Storage Length (m)
		AM	PM	SAT	
Hwy 140/Elizabeth Street and Main Street (Signal)	EBL	40 [20]	105 [50]	65 [30]	115
	EBR	10 [0]	5 [0]	10 [0]	110
	WBL	15 [10]	10 [5]	15 [5]	100
	WBR	10 [0]	10 [0]	5 [0]	30
	NBL	20 [5]	15 [5]	25 [10]	100
	SBL	15 [5]	20 [10]	10 [0]	115
	SBR	15 [0]	30 [15]	15 [0]	25

3.7 Recommendations

The eastbound left-turn lane at the intersection of Highway 140/Elizabeth Street and Main Street is expected to operate with a Level of Service “F” and volume-to-capacity ratio of 1.02 in the weekday P.M. peak hour primarily due to the background traffic growth.

To mitigate the capacity issues in the 2041 future background conditions, the signal timings for the weekday P.M. peak hour were optimized by providing an eastbound left-turn permissive/protected phase while maintaining the existing cycle length.

The intersection improvement is summarized in **Table 11**.

Table 11: 2041 Future Background Intersection Optimization

Intersection	Movement	Performance Metrics					
		Previous			Improved		
		LOS	Delay	V/C Ratio	LOS	Delay	V/C Ratio
Highway 140/Elizabeth Street and Main Street (Signalized)	Overall	C	25.5	1.02	B	16.0	0.69
	EBL	F	81.9	1.02	B	10.8	0.58
	EBT	C	20.4	0.54	B	10.2	0.40
	EBR	A	4.3	0.10	A	2.7	0.08
	WBL	B	14.3	0.10	B	16.3	0.10
	WBT	B	19.9	0.53	C	22.9	0.61
	WBR	A	4.2	0.11	A	3.2	0.12
	NBL	B	17.8	0.14	C	25.9	0.26
	NBTR	B	16.9	0.28	C	27.4	0.53
	SBL	B	19.0	0.22	C	30.4	0.43
	SBT	B	18.3	0.22	C	27.8	0.42
SBR	A	7.4	0.57	A	9.7	0.69	

Upon observation, it is anticipated that the overall intersection operation will improve after signal timing optimization, leading to an upgrade in the Level of Service from “C” to “B”. Specifically, the eastbound left-turn lane is expected to operate more efficiently with the implementation of a dedicated left-turn phase, resulting in an improved volume-to-capacity ratio of 0.69 from the previous 1.02.

Appendix J shows the optimized signal timing and intersection operations.

4.0 Site Generated Traffic

The proposed development mixed-use will result in additional turning movements at the study intersections. Therefore, this section describes the trip forecasting methodology and results of this forecast for the development proposal including trip generation, distribution, and assignment.

4.1 Trip Generation

As noted, the development is proposed to consist of the following:

- 1,027 Single Detached Units
- 1,215 Townhouse Units
- Commercial Area with a GFA of approximately 6,250 m² (67,274 ft²)

The trip generation of the proposed residential dwelling and commercial area was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition.

The applicable fitted curve equations for Land Use Category (LUC) 210 "Single Family Detached Housing" and LUC 215 "Single-Family Attached Housing" were applied to the proposed residential dwelling units depending on the availability of data for each use.

The average rates during the peak hours were used for LUC 821 "Shopping Plaza" and it is currently assumed it would not include a Supermarket.

The equation/average rates used for trip estimation are shown in **Table 12**.

The internal capture rate for mixed-use development was calculated based on the NCHRP methodology and pass-by rates were determined from the ITE Trip Generation Handbook for LUC 821 "Shopping Plaza," as follows: 40% during the weekday P.M. peak period and 31% during the weekend peak period.

The forecasted trip generation of the proposed mixed-use development is summarized in **Table 13**.

Relevant excerpts from the ITE Trip Generation Manual, 11th Edition and ITE Trip Generation Handbook, 3rd Edition have been included in **Appendix K**.

Table 12: Trip Generation

Land Use	Units/GFA	Peak Hour		Splits	Equation/Rate
210: Single Family Detached	1,027 Units	Weekday A.M.	In	25%	$\ln(T) = 0.91 \ln(X) + 0.12$
			Out	75%	
		Weekday P.M.	In	63%	$\ln(T) = 0.94 \ln(X) + 0.27$
			Out	37%	
		Saturday	In	54%	$T = 0.86 X + 9.72$
			Out	46%	
215: Single Family Attached	1,215 Units	Weekday A.M.	In	25%	$T = 0.52 X - 5.7$
			Out	75%	
		Weekday P.M.	In	59%	$T = 0.6 X - 3.93$
			Out	41%	
		Saturday	In	48%	$\ln(T) = 0.82 \ln(X) + 0.43$
			Out	52%	
821: Shopping Plaza (40 – 150 K)	67,274 ft ²	Weekday A.M.	In	62%	1.73
			Out	38%	
		Weekday P.M.	In	49%	5.19
			Out	51%	
		Saturday	In	52%	6.12
			Out	48%	

Table 13: Site Trips

Trip Generation	Land Use	Units/GFA	Weekday AM		Weekday PM		Saturday	
			In	Out	In	Out	In	Out
Site Generated Trips	Single Family Detached (LUC 210)	1,027	155	465	559	328	482	411
	Single Family Attached (LUC 215)	1,215	157	470	428	297	332	360
	Shopping Plaza 40-150 K (LUC 821)	67,274 ft ²	72	44	171	178	218	201
	Total		384	979	1159	803	1032	972
Internal Capture (NCHRP)	Single Family Detached (LUC 210)	1,027	3	5	26	9	31	14
	Single Family Attached (LUC 215)	1,215	3	5	20	8	21	13
	Shopping Plaza 40-150 K (LUC 821)	67,274 ft ²	9	6	17	46	22	59
Pass-By Trips	Shopping Plaza 40-150 K (LUC 821)	67,274 ft ²	0	0	53	53	44	44
Total Internal Capture and Pass-By Reduction			15	16	116	116	118	130
Net Generated Trips			369	963	1043	687	914	842

Therefore, the full buildout of the proposed development is expected to generate a total of 1332 (369 inbound and 963 outbound) two-way trips during the weekday A.M. peak hour, 1730 (1043 inbound and 687 outbound) two-way trips during the weekday P.M. peak hour and 1756 (914 inbound and 842 outbound) two-way trips during the weekend peak hour.

4.2 Trip Distribution and Assignment

The Transportation Tomorrow Survey (TTS) is a comprehensive travel data survey conducted in the Greater Toronto and Hamilton Area. Data from the 2016 TTS was used to determine the peak hour trip distribution at the site.

The trip distribution calculations based on the TTS data are summarized in **Table 14**. **Figure 8** shows the trips generated by the residential use and **Figure 9** shows the trips generated by the commercial use.

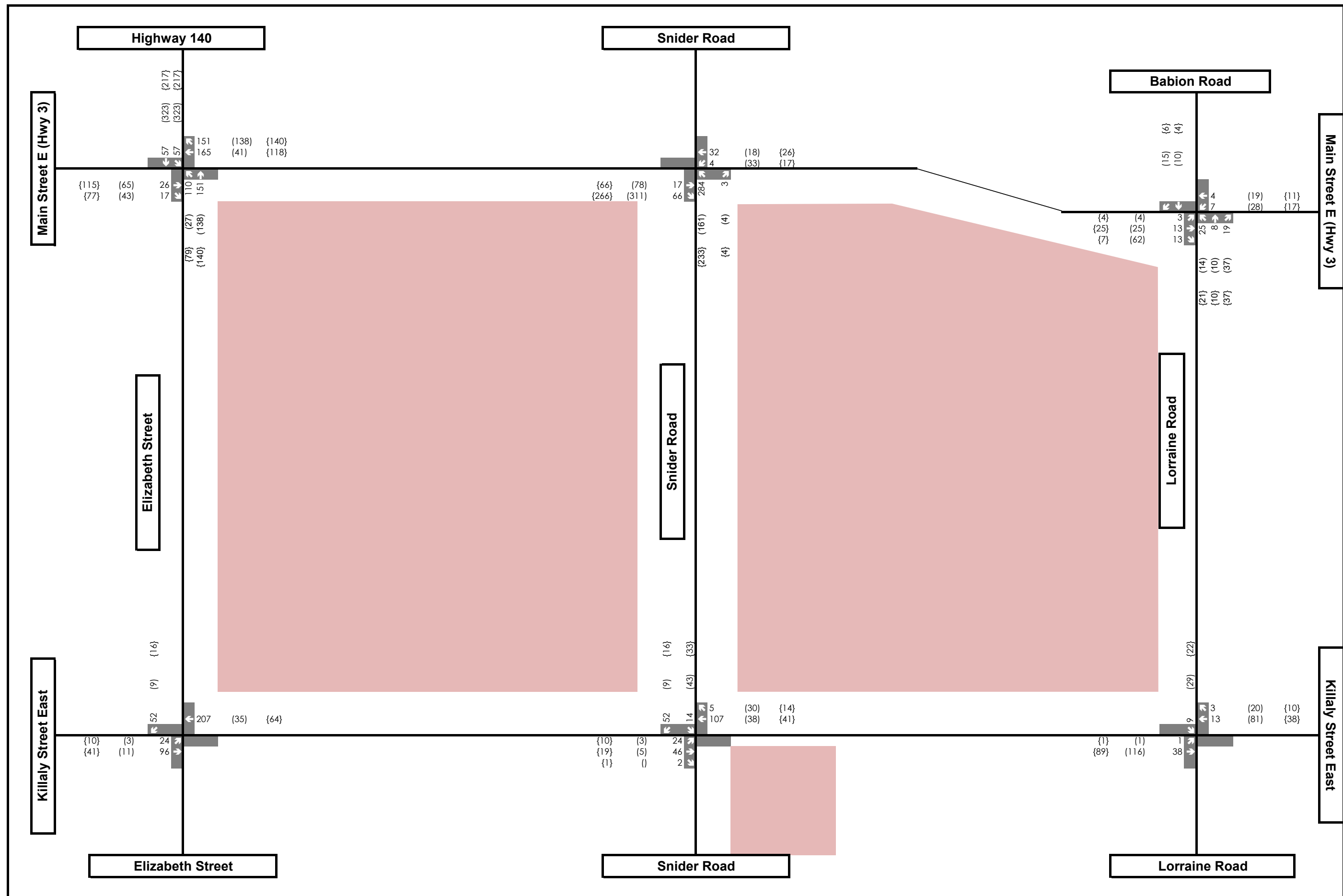
The pass-by trips were routed in and out of the commercial blocks for the Weekday P.M. and Weekend peak hours and the trips are summarized in **Figure 10**.

It is noted that the trip assignments for the residential and commercial uses were calculated separately using the Transportation Tomorrow Survey given the residential trips will be more commuter based and that commercial trips are expected to be more locally based.

Appendix L provides the TTS query used to determine the site trip distribution.

Table 14: Site Distribution

Direction	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Saturday Peak Hour	
	In	Out	In	Out	In	Out
Northwest	4%	0%	15%	11%	4%	0%
North	42%	31%	59%	26%	42%	31%
Northeast	0%	6%	8%	17%	0%	6%
East	0%	9%	10%	29%	0%	9%
Southeast	9%	0%	3%	1%	9%	0%
South	0%	0%	0%	0%	0%	0%
Southwest	31%	0%	0%	0%	31%	0%
West	14%	55%	6%	16%	14%	55%

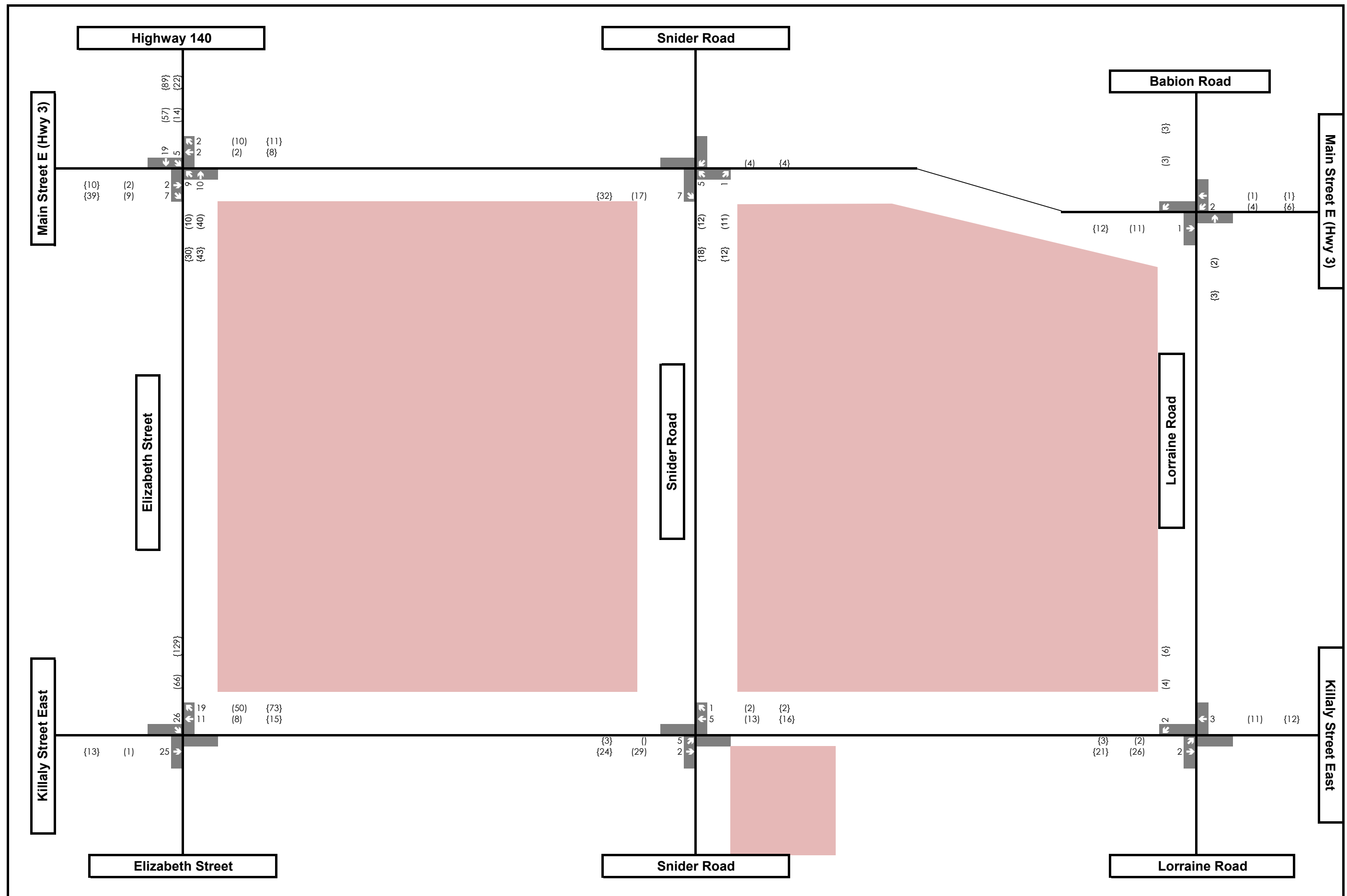


Legend	
xx	A.M. Peak Hour Traffic Volumes
{xx}	P.M. Peak Hour Traffic Volumes
{xx}	Weekend Peak Hour Traffic Volumes

806 Killaly Street East
Site Generated Trips - Residential



Figure 8
 Project No. 2578-6905
 Date: 12.15.2023
 Analyst: Aarzo D

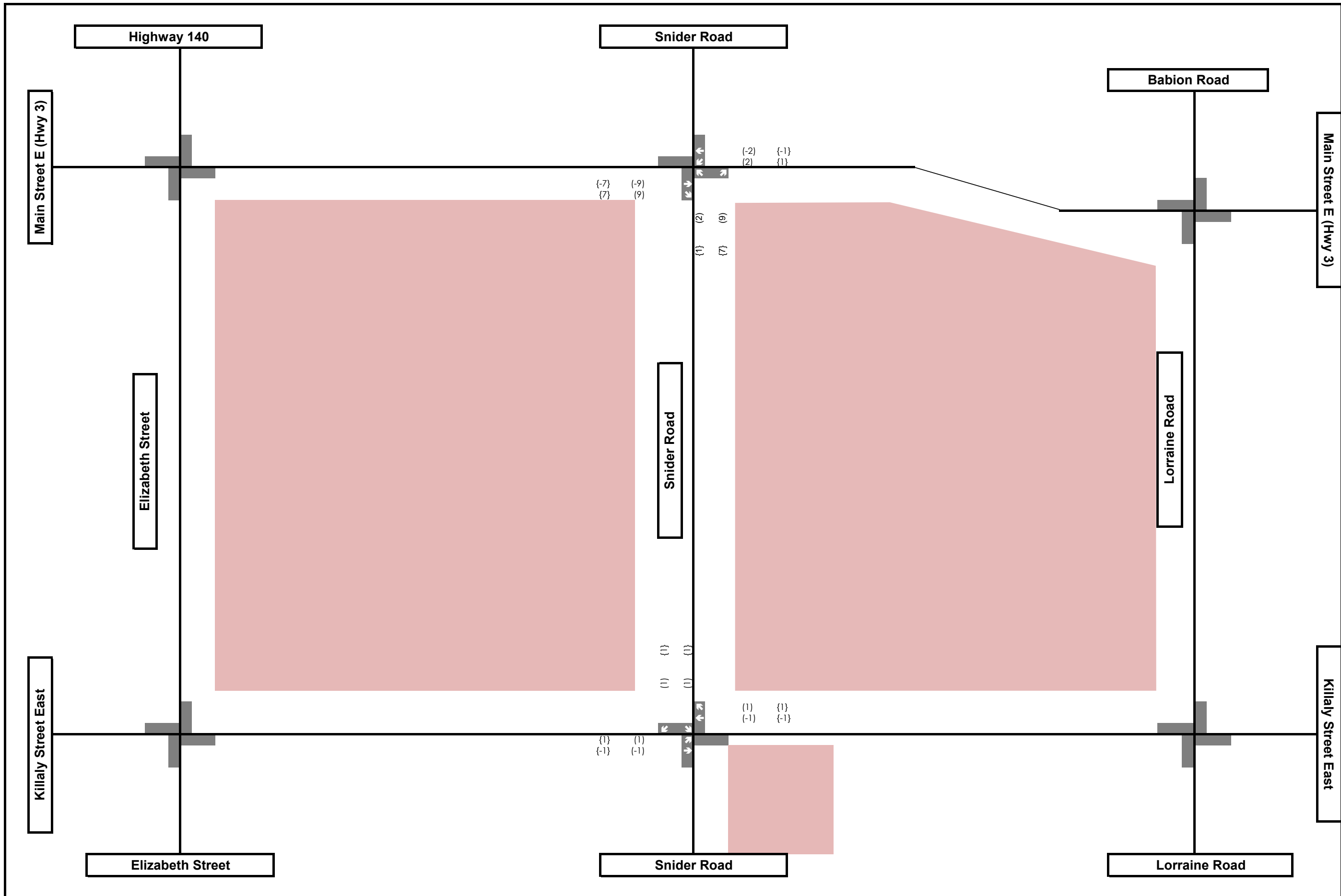


Legend	
xx	A.M. Peak Hour Traffic Volumes
{xx}	P.M. Peak Hour Traffic Volumes
{xx}	Weekend Peak Hour Traffic Volumes

806 Killaly Street East
Site Generated Trips - Commercial



Figure 9
 Project No. 2578-6905
 Date: 12.15.2023
 Analyst: Aarzo D



Legend	
xx	A.M. Peak Hour Traffic Volumes
{xx}	P.M. Peak Hour Traffic Volumes
{xx}	Weekend Peak Hour Traffic Volumes

806 Killaly Street East
Site Generated Pass-By Trips



Figure 10
 Project No. 2578-6905
 Date: 12.15.2023
 Analyst: Aarzo D

5.0 Future Total Conditions

This section discusses the projected future total traffic conditions and traffic operations at the study intersections with the addition of the site generated trips by the proposed development and the background developments in the vicinity of the subject site for the horizon years 2031, 2031 and 2041.

5.1 2031 Intersection Operations

Table 15 outlines the 2031 future total conditions traffic operations at the signalized and unsignalized intersections.

Under 2031 future total conditions, the unsignalized intersections are expected to operate similarly to the 2031 future background conditions, maintaining a Level of Service "C" or better with minimal delays and well under capacity. However, the northbound shared left/through/right movement at Main Street and Snider Road is expected to deteriorate to a Level of Service "F" in the Weekday A.M. and P.M. and Weekend peak hours, with an increase in delay of 56.7, 158.2 and 166.1 seconds and an expected rise in the volume-to-capacity ratio from 0.00 to 0.88, 0.01 to 1.14 and 0.01 to 1.21 in the Weekday A.M., P.M. and Weekend peak hours respectively.

The southbound shared left/through/right movement at Killaly Street and Elizabeth Street is expected to deteriorate with to a Level of Service "D" in the Weekday A.M. and Weekend peak hours, with a minor increase in delay of 14.9 and 16.7 seconds and an expected rise in the volume-to-capacity ratio from 0.20 to 0.58 and 0.20 to 0.50 in the Weekday A.M. and Weekend peak hours respectively.

The signalized intersection at Highway 140/Elizabeth Street and Main Street East operates similarly to the 2031 future background conditions in the Weekday A.M. peak hour, maintaining an overall Level of Service "B" with minimal delays and under capacity. However, the Level of Service for Weekday P.M. and Weekend peak hours are expected to deteriorate to Levels of Service "F" and "C", respectively.

Further, the northbound left-turn and southbound left-turn movements are expected to deteriorate to a Level of Service "F" and the southbound through movement is expected to deteriorate to a Level of Service "E" in the Weekday P.M. peak hour. The intersection experiences an increase in delay of at least 79.6 seconds and an increase in volume-to-capacity ratio from 0.81 to 2.02.

As per **Table 16**, the southbound left-turn and southbound right-turn 95th percentile queue lengths at the intersection of Highway 140/Elizabeth Street and Main Street are expected to exceed the available storage length during the Weekday P.M. peak hour.

Appendix M contains the 2031 future total conditions detailed capacity analysis.

Figure 11 shows the 2031 future total traffic volumes.

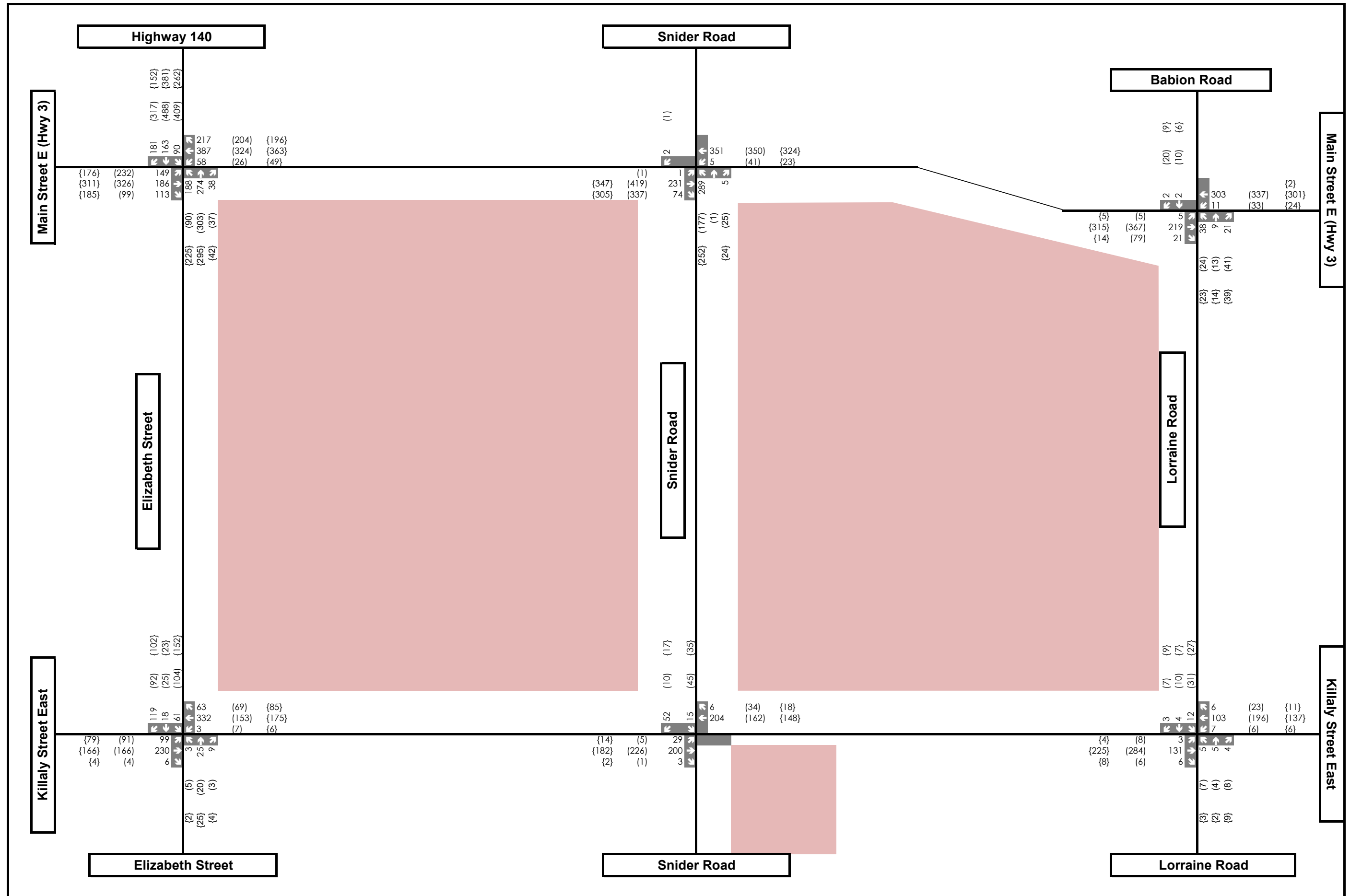


Table 15: 2031 Future Total Traffic Operations

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Hwy 140/Elizabeth Street and Main Street (Signal)	Overall	B	F	C	18.7	97.6	23.6	0.77	2.02	0.81
	EBL	D	B	D	36.1	15.1	45.8	0.70	0.56	0.80
	EBT	B	B	C	17.9	16.3	23.7	0.36	0.47	0.62
	EBR	A	A	A	3.8	3.0	3.9	0.21	0.15	0.33
	WBL	B	C	B	15.4	20.7	16.0	0.16	0.09	0.17
	WBT	C	C	C	30.4	30.6	24.5	0.77	0.66	0.66
	WBR	A	A	A	4.9	6.6	4.1	0.37	0.37	0.33
	NBL	C	F	D	20.9	107.1	39.3	0.44	0.94	0.76
	NBTR	B	C	B	19.8	30.5	19.6	0.49	0.68	0.51
	SBL	B	F	D	19.3	497.5	41.5	0.28	2.02	0.81
	SBT	B	E	C	16.8	59.1	21.2	0.25	0.96	0.57
SBR	A	B	A	4.3	16.4	7.1	0.31	0.62	0.26	
Main Street and Snider Road (TWSC)	Overall	F	F	F	56.7	158.2	166.1	0.88	1.14	1.21
	EBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.1	1.7	0.9	0.00	0.06	0.03
	NBLTR	F	F	F	56.7	158.2	166.1	0.88	1.14	1.21
	SBLTR	B	B	A	10.4	10.4	0.0	0.00	0.00	0.00
Main Street and Lorraine Road/Babion Road (TWSC)	Overall	B	C	B	13.9	17.2	14.9	0.15	0.22	0.18
	EBLT	A	A	A	0.2	0.1	0.2	0.00	0.00	0.00
	EBR	A	A	A	0.0	0.0	0.0	0.01	0.05	0.01
	WBLT	A	A	A	0.4	1.1	0.8	0.01	0.03	0.02
	WBR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	B	C	B	13.9	17.2	14.9	0.15	0.22	0.18
	SBLTR	B	B	B	12.1	13.9	12.7	0.01	0.08	0.03
Killaly Street and Lorraine Road (TWSC)	Overall	B	B	B	10.5	14.1	11.9	0.03	0.12	0.08
	EBLTR	A	A	A	0.2	0.3	0.1	0.00	0.01	0.00
	WBLTR	A	A	A	0.5	0.3	0.4	0.01	0.01	0.01
	NBLTR	B	B	B	10.3	12.4	10.5	0.02	0.04	0.02
	SBLTR	B	B	B	10.5	14.1	11.9	0.03	0.12	0.08

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Killaly Street and Snider Road (TWSC)	Overall	A	A	A	10.7	12.2	11.3	0.11	0.11	0.09
	EBLTR	A	A	A	1.2	0.2	0.6	0.00	0.00	0.01
	WBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	SBLTR	B	B	B	10.7	12.2	1.3	0.11	0.11	0.09
Killaly Street and Elizabeth Road (TWSC)	Overall	D	C	D	27.0	20.0	27.9	0.58	0.50	0.67
	EBLTR	A	A	A	3.2	3.2	3.0	0.10	0.08	0.07
	WBLTR	A	A	A	0.1	0.3	0.2	0.00	0.01	0.01
	NBLTR	C	C	B	19.7	15.8	15.4	0.14	0.08	0.09
	SBLTR	D	C	D	27.0	20.0	27.9	0.58	0.50	0.67

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).

Note 2: All v/c ratios of 0.85 and greater than 0.85 are bolded and greater than 1.00 are bolded with red text.

The critical v/c threshold for intersections with Regional Roads and provincial Roads (Highway 140 & Highway 3) is 0.85 for all movements per Niagara Region and MTO guidelines..

Table 16: 2031 Future Total Conditions Queuing Assessment

Intersection	Performance Metrics				
	Movement	95 th Percentile Queue Length (m) [50 th Percentile Queue Length (m)]			Auxiliary Lane Storage Length (m)
		AM	PM	SAT	
Hwy 140/Elizabeth Street and Main Street (Signal)	EBL	45 [20]	35 [20]	55 [25]	115
	EBR	10 [0]	10 [0]	15 [0]	110
	WBL	15 [5]	10 [5]	15 [5]	100
	WBR	15 [5]	20 [5]	15 [0]	30
	NBL	45 [20]	45 [15]	75 [35]	100
	SBL	25 [10]	170 [115]	95 [35]	115
	SBR	15 [0]	50 [25]	20 [5]	25

5.2 2036 Intersection Operations

Table 17 outlines the 2036 future total conditions traffic operations at the signalized and unsignalized intersections.

Under 2036 future total conditions, the unsignalized intersections are expected to operate similarly to the 2036 future background conditions, maintaining a Level of Service "C" or better with minimal delays and well under capacity. However, the northbound shared left/through/right movement at Main Street and Snider Road is expected to deteriorate to a Level of Service "F" in the Weekday A.M. and P.M. and Weekend peak hours, with an increase in delay of 91.0, 219.1 and 235.5 seconds and an expected rise in the volume-to-capacity ratio from 0.00 to 1.04, 0.01 to 1.33 and 0.01 to 1.37 in the Weekday A.M., P.M. and Weekend peak hours respectively.

The southbound shared left/through/right movement at Killaly Street and Eliabeth Street is expected to operate similarly to the 2036 future background conditions.

The signalized intersection at Highway 140/Elizabeth Street and Main Street East operates similarly to the 2036 future background conditions in the Weekday A.M. peak hour, maintaining an overall Level of Service "C" with minimal delays and under capacity. However, the Level of Service for Weekday P.M. and Weekend peak hours are expected to deteriorate to Levels of Service "F" and "C", respectively.

Further, the northbound left-turn and southbound left-turn movements are expected to deteriorate to a Level of Service "F" and the southbound through movement is expected to deteriorate to a Level of Service "E" in the Weekday P.M. peak hour and the southbound left movement is expected to deteriorate to a Level of Service "E" in the Weekend peak hour. The intersection experiences an increase in delay of at least 79.1 seconds and an increase in volume-to-capacity ratio from 0.89 to 2.05 in the Weekday P.M. peak hour and a minor increase in delay of 10.4 seconds and an increase in volume-to-capacity ratio from 0.72 to 0.91 in the Weekend peak hour.

As per **Table 18**, the southbound left-turn and southbound right-turn 95th percentile queue lengths at the intersection of Highway 140/Elizabeth Street and Main Street are expected to exceed the available storage length during the Weekday P.M. peak hour.

Appendix N contains the 2036 future total conditions detailed capacity analysis.

Figure 12 shows the 2036 future total traffic volumes.

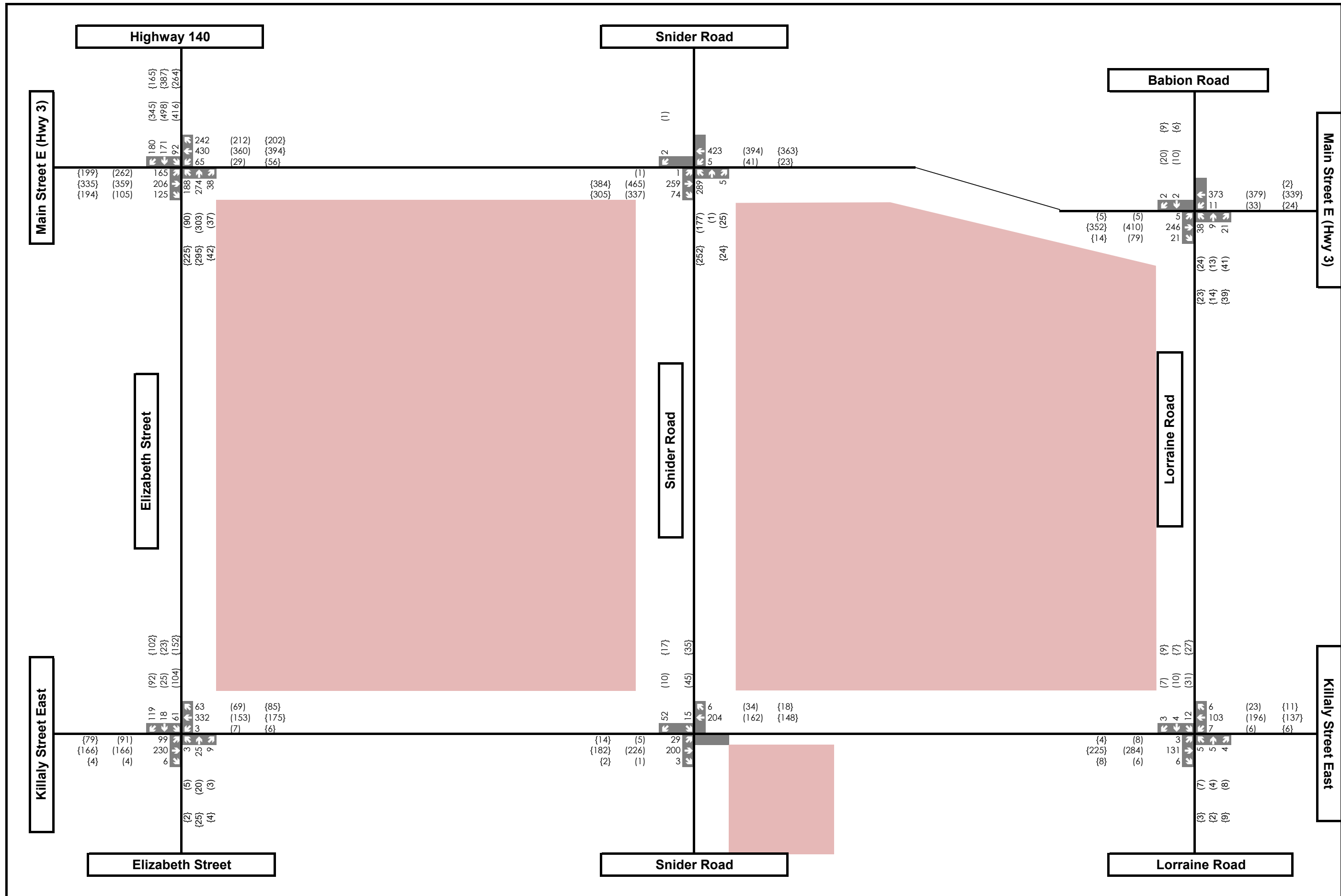


Table 17: 2036 Future Total Traffic Operations

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Hwy 140/Elizabeth Street and Main Street (Signal)	Overall	C	F	C	21.0	99.1	27.5	0.83	2.05	0.91
	EBL	D	B	E	53.2	19.5	58.7	0.83	0.68	0.89
	EBT	B	B	C	17.9	17.2	21.0	0.38	0.52	0.56
	EBR	A	A	A	3.7	3.0	3.6	0.22	0.16	0.32
	WBL	B	C	B	15.4	21.0	15.9	0.17	0.11	0.19
	WBT	C	C	C	33.5	34.4	23.9	0.82	0.73	0.66
	WBR	A	A	A	5.7	7.9	4.8	0.40	0.39	0.34
	NBL	C	F	D	22.0	128.5	50.7	0.45	1.01	0.84
	NBTR	C	C	C	20.8	30.5	21.9	0.51	0.68	0.55
	SBL	C	F	E	20.2	511.4	59.7	0.30	2.05	0.91
	SBT	B	E	C	17.6	63.5	23.8	0.27	0.98	0.61
SBR	A	B	A	4.4	17.9	7.9	0.32	0.67	0.31	
Main Street and Snider Road (TWSC)	Overall	F	F	F	101.7	236.6	235.5	1.04	1.33	1.37
	EBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.0
	WBLTR	A	A	A	0.1	1.6	0.9	0.00	0.06	0.03
	NBLTR	F	F	F	101.7	236.6	235.5	1.04	1.33	1.37
	SBLTR	B	B	A	11.0	10.8	0.0	0.00	0.00	0.00
Main Street and Lorraine Road/Babion Road (TWSC)	Overall	C	C	C	15.5	19.2	16.2	0.18	0.25	0.20
	EBLT	A	A	A	0.2	0.1	0.1	0.00	0.00	0.00
	EBR	A	A	A	0.0	0.0	0.0	0.01	0.05	0.01
	WBLT	A	A	A	0.3	1.0	0.8	0.01	0.03	0.02
	WBR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	C	C	C	15.5	19.2	16.2	0.18	0.25	0.20
	SBLTR	B	B	B	13.1	14.9	13.4	0.01	0.08	0.04
Killaly Street and Lorraine Road (TWSC)	Overall	B	B	B	10.5	14.1	11.9	0.03	0.12	0.08
	EBLTR	A	A	A	0.2	0.3	0.1	0.00	0.01	0.00
	WBLTR	A	A	A	0.5	0.3	0.4	0.01	0.01	0.01
	NBLTR	B	B	B	10.3	12.4	10.5	0.02	0.04	0.02
	SBLTR	B	B	B	10.5	14.1	11.9	0.03	0.12	0.08

Intersection	Movement	Performance Metrics								
		LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Killaly Street and Snider Road (TWSC)	Overall	B	B	B	10.7	12.2	11.3	0.10	0.11	0.09
	EBLTR	A	A	A	1.2	0.2	0.6	0.02	0.00	0.01
	WBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	SBLTR	B	B	B	10.7	12.2	11.3	0.10	0.11	0.09
Killaly Street and Elizabeth Road (TWSC)	Overall	D	C	D	27.0	20.0	27.8	0.58	0.50	0.67
	EBLTR	A	A	A	3.2	3.2	3.0	0.10	0.08	0.07
	WBLTR	A	A	A	0.1	0.3	0.2	0.00	0.01	0.01
	NBLTR	C	C	C	19.7	15.8	15.4	0.14	0.08	0.09
	SBLTR	D	C	D	27.0	20.0	27.8	0.58	0.50	0.67

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).

Note 2: All v/c ratios of 0.85 and greater than 0.85 are bolded and greater than 1.00 are bolded with red text.

The critical v/c threshold for intersections with Regional Roads and provincial Roads (Highway 140 & Highway 3) is 0.85 for all movements per Niagara Region and MTO guidelines..

Table 18: 2036 Future Total Conditions Queuing Assessment

Intersection	Movement	Performance Metrics			
		95 th Percentile Queue Length (m) [50 th Percentile Queue Length (m)]			Auxiliary Lane Storage Length (m)
		AM	PM	SAT	
Hwy 140/Elizabeth Street and Main Street (Signal)	EBL	60 [25]	40 [25]	70 [30]	115
	EBR	10 [0]	10 [0]	15 [0]	110
	WBL	15 [10]	10 [5]	15 [5]	100
	WBR	20 [5]	25 [5]	15 [5]	30
	NBL	45 [25]	50 [15]	85 [35]	100
	SBL	25 [10]	175 [115]	95 [45]	115
	SBR	15 [0]	55 [25]	20 [5]	25

5.3 2041 Intersection Operations

Table 19 delineates the 2041 future total conditions traffic operations at the signalized and unsignalized intersections.

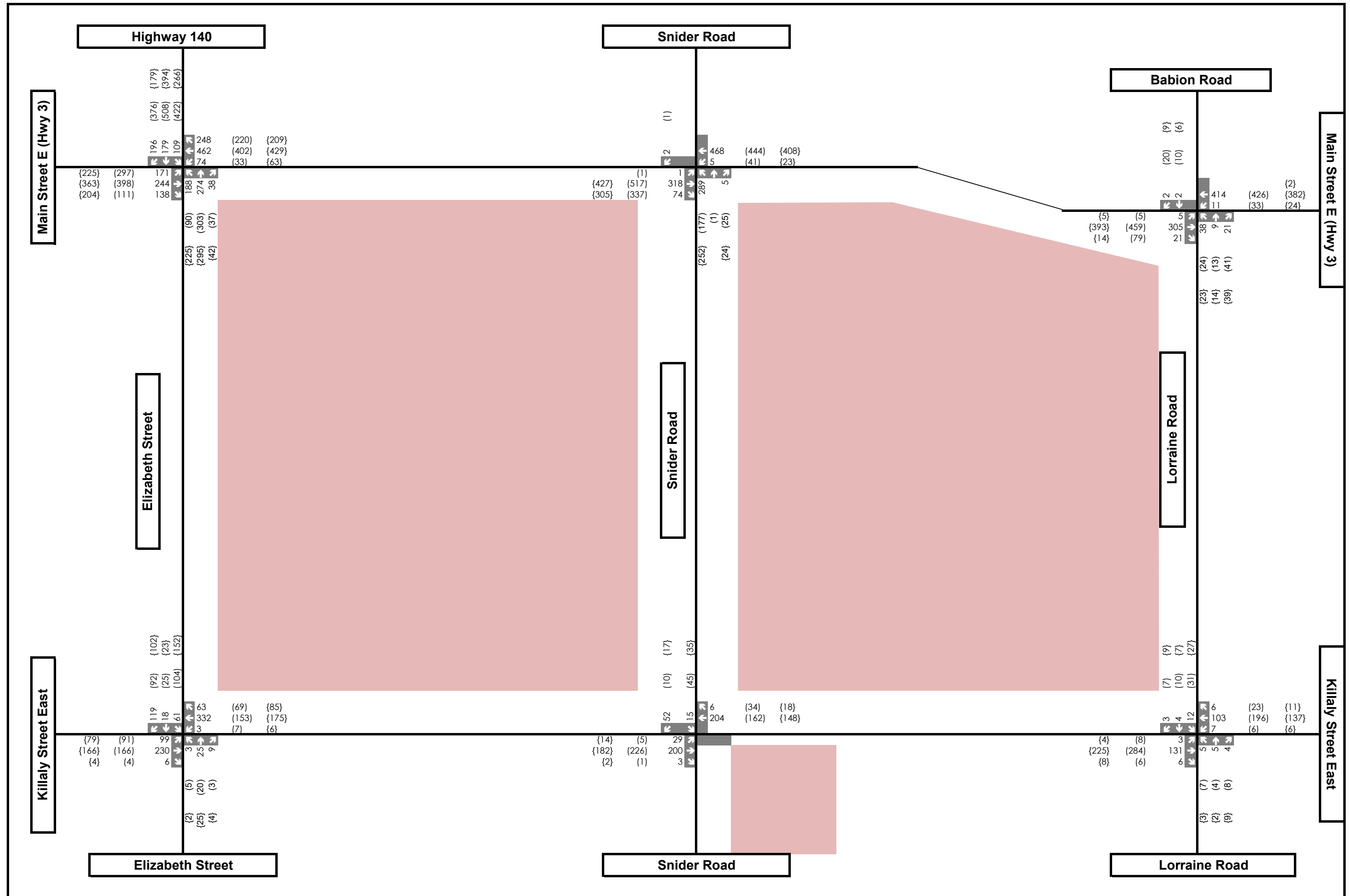
Under 2041 future total conditions, the unsignalized intersections are expected to operate similarly to the 2041 future background conditions, maintaining a Level of Service "C" or better with minimal delays and well under capacity. However, the northbound shared left/through/right movement at Main Street and Snider Road is expected to deteriorate to a Level of Service "F" in the Weekday A.M., P.M. and Weekend peak hours, with an increase in delay of 167.3, 283.1 and 331.6 seconds and an expected rise in the volume-to-capacity ratio from 0.00 to 0.1.24, 0.01 to 1.58 and 0.01 to 1.59 in the Weekday A.M., P.M. and Weekend peak hours respectively.

The signalized intersection at Highway 140/Elizabeth Street and Main Street East is forecasted to worsen compared to the 2041 future background conditions, expected to operate at a deteriorated Level of Service "C" in the Weekday A.M. and weekend peak hours and "F" in the Weekday P.M. peak hour, with high delays and above capacity. During the Weekday A.M. peak hour, the eastbound left-turn movement is expected to deteriorate to Level of Service "E". During the Weekday P.M. peak hour, the northbound left-turn and southbound left-turn movements are expected to deteriorate to a Level of Service "F" and the southbound through movement is expected to deteriorate to a Level of Service "E". During the Weekend peak hour, the eastbound left-turn and southbound left-turn movements are expected to deteriorate to Level of Service "E" and the northbound left-turn movement is expected to deteriorate to a Level of Service "F".

As per **Table 20**, the southbound left-turn and southbound right-turn 95th percentile queue lengths at the intersection of Highway 140/Elizabeth Street and Main Street are expected to exceed the available storage length during the Weekday P.M. peak hour.

Appendix O contains the 2041 future total conditions detailed capacity analysis.

Figure 13 shows the 2041 future background traffic volumes.



Legend	
xx	A.M. Peak Hour Traffic Volumes
{xx}	P.M. Peak Hour Traffic Volumes
{xx}	Weekend Peak Hour Traffic Volumes

806 Killaly Street East
2041 Future Total Traffic Volumes



Figure 13
 Project No. 2578-6905
 Date: 12.15.2023
 Analyst: Aarzo D

Table 19: 2041 Future Total Traffic Operations

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Hwy 140/Elizabeth Street and Main Street (Signal)	Overall	C	F	C	22.9	101.9	33.8	0.90	2.09	0.98
	EBL	E	C	E	65.5	33.0	79.5	0.90	0.84	0.98
	EBT	B	B	C	18.6	18.5	22.4	0.43	0.58	0.61
	EBR	A	A	A	3.6	3.5	3.5	0.23	0.17	0.32
	WBL	B	C	B	15.6	21.4	16.1	0.19	0.13	0.21
	WBT	D	D	C	35.6	41.5	23.4	0.85	0.83	0.66
	WBR	A	A	A	6.3	9.5	5.1	0.40	0.41	0.31
	NBL	C	F	F	23.0	158.4	80.6	0.47	1.10	0.98
	NBTR	C	C	C	21.8	30.5	23.3	0.52	0.68	0.57
	SBL	C	F	E	22.3	525.3	76.5	0.37	2.09	0.98
	SBT	B	E	C	18.5	68.5	26.1	0.29	1.00	0.65
SBR	A	B	A	4.5	19.9	8.0	0.34	0.72	0.32	
Main Street and Snider Road (TWSC)	Overall	F	F	F	178.4	302.8	351.3	1.24	1.58	1.59
	EBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	WBLTR	A	A	A	0.1	1.5	1.7	0.00	0.06	0.03
	NBLTR	F	F	F	178.4	302.8	351.3	1.24	1.58	1.59
	SBLTR	B	B	A	11.4	11.4	11.2	0.00	0.00	0.00
Main Street and Lorraine Road/Babion Road (TWSC)	Overall	C	C	C	17.6	22.1	17.9	0.21	0.29	0.23
	EBLT	A	A	A	0.2	0.1	0.1	0.00	0.00	0.00
	EBR	A	A	A	0.0	0.0	0.0	0.01	0.05	0.01
	WBLT	A	A	A	0.3	1.0	0.7	0.01	0.04	0.02
	WBR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	C	C	C	17.6	22.1	17.9	0.21	0.29	0.23
	SBLTR	B	C	B	14.1	16.2	14.3	0.01	0.09	0.04
Killaly Street and Lorraine Road (TWSC)	Overall	B	B	B	10.5	14.1	11.9	0.03	0.12	0.08
	EBLTR	A	A	A	0.2	0.3	0.1	0.00	0.01	0.00
	WBLTR	A	A	A	0.5	0.3	0.4	0.01	0.01	0.01
	NBLTR	B	B	B	10.3	12.4	10.5	0.02	0.04	0.02
	SBLTR	B	B	B	10.5	14.1	11.9	0.03	0.12	0.08

Intersection	Performance Metrics									
	Movement	LOS ¹			Delay (s)			v/c ratio ²		
		AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Killaly Street and Snider Road (TWSC)	Overall	B	B	B	10.7	12.2	11.3	0.10	0.11	0.09
	EBLTR	A	A	A	1.2	0.2	0.6	0.02	0.00	0.01
	WBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	NBLTR	A	A	A	0.0	0.0	0.0	0.00	0.00	0.00
	SBLTR	B	B	B	10.7	12.2	11.3	0.10	0.11	0.09
Killaly Street and Elizabeth Road (TWSC)	Overall	D	C	D	27.0	20.0	27.9	0.58	0.50	0.67
	EBLTR	A	A	A	3.2	3.2	3.0	0.10	0.08	0.07
	WBLTR	A	A	A	0.1	0.3	0.2	0.00	0.01	0.01
	NBLTR	C	C	C	19.7	15.8	15.4	0.14	0.08	0.09
	SBLTR	D	C	D	27.0	20.0	27.9	0.58	0.50	0.67

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).

Note 2: All v/ c ratios of 0.85 and greater than 0.85 are bolded and greater than 1.00 are bolded with red text.

The critical v/c threshold for intersections with Regional Roads and provincial Roads (Highway 140 & Highway 3) is 0.85 for all movements per Niagara Region and MTO guidelines..

Table 20: 2041 Future Total Conditions Queuing Assessment

Intersection	Performance Metrics				Auxiliary Lane Storage Length (m)
	Movement	95 th Percentile Queue Length (m) [50 th Percentile Queue Length (m)]			
		AM	PM	SAT	
Hwy 140/Elizabeth Street and Main Street (Signal)	EBL	65 [25]	65 [30]	85 [40]	115
	EBR	10 [0]	10 [5]	15 [0]	110
	WBL	20 [10]	15 [5]	15 [10]	100
	WBR	25 [10]	25 [10]	20 [5]	30
	NBL	45 [25]	50 [20]	85 [40]	100
	SBL	30 [15]	175 [120]	100 [45]	115
	SBR	15 [0]	65 [30]	25 [10]	25

5.4 Warrants

As a result of the deteriorating traffic operations, potentially due to the future background conditions and site generated traffic, a Signal warrant was conducted for the intersection of Main Street and Snider Street and an All-Way Stop Control warrant was conducted for the intersection of Killaly Street and Elizabeth Street for the 2031 future total scenario contained herein.

5.4.1 Signal Warrant for Main Street and Snider Road

Per the 2041 future total intersection analysis, signal warrants per the Ontario Traffic Manual (OTM) Book 12, Justification 7 (Projected Volumes) were conducted for the intersection of Main Street and Snider Road with the projected 2031 future total volumes.

Although signals would not be warranted for the intersection per the warrants primarily due to the 120% satisfaction rate, the analysis results finds that Justification 1A: Vehicle volumes at all approaches are 120% and Justification 2B: Combined vehicle and pedestrian crossing volumes crossing from minor streets are 234%.

Further, as per the Justification 1B: Vehicle volumes along minor street are 104% and per the Justification 2A: Vehicle volumes at major street are 94% and may satisfy the warrant requirements in the future should the projected volumes materialize.

Additionally, in the absence of signals, the northbound shared left/through/right approach would experience very high delays and a poor LOS under traffic conditions. Therefore, signals have been recommended for the intersection of Main Street and Snider Road to improve traffic operations and safety at the intersection.

Appendix P contains the signal warrant.

5.4.2 Eastbound Right-Turn Lane Warrant for Main Street and Snider Street

The analysis indicates that the anticipated volume of eastbound right-turning traffic, standing at approximately 24% of the total approaching volume, surpasses the threshold of 20%. Consequently, a recommendation is made for the incorporation of a designated right-turn lane on the eastbound approach to accommodate this notable percentage and a right-turn phasing is not recommended with intersection anticipated to function efficiently without necessitating a right-turn phase.

Further, the MTO Design Supplement is under review and therefor the TAC guidelines section 19.4.2 was reviewed to derive specifications for storage and taper lengths. Reflecting the roadway's design speed, a recommendation of a 60-meter storage and a 55-meter taper is advised to effectively cater to the needs of eastbound right-turn movements.

5.4.3 All-Way-Stop-Control Warrant at Killaly Street and Elizabeth Street

Per the 2031 future total intersection analysis, All-Way Stop Control (AWSC) warrants per the Ontario Traffic Manual (OTM) Book 5, Justification 1-3 were conducted for the intersections of Killaly Street and Elizabeth Street with the projected 2029 future total volumes. Per the warrants contained in **Appendix P**, All-Way Stop Control would not be warranted for the Weekday A.M. and P.M. peak hours.

Further, it is noted that the Justification 1, 2A and 2B are justified and Justification 3 is not justified due the volume split not being met for Weekday P.M. peak hour. However, the Weekday P.M. is anticipated to operate above the threshold of 0.30 and therefore an All-Way-Stop Control is recommended at the intersection.

The existing configuration of the intersection comprises two pedestrian crossing strips accompanied by a pedestrian crossing sign along the eastbound approach. However, it is noted that the current configuration does not comply with the standards outlined in the Ontario Traffic Manual Book 15. Specifically, these standards advocate for a 2.5-meter wide single crossing and the inclusion of pedestrian signs featuring flashing beacons. In light of these considerations and improved pedestrian safety, detailed specifications regarding this modification can be provided in subsequent applications for further review.

5.5 Recommendations

To improve the intersection operations for the signalized intersection of Highway 140/Elizabeth Street and Main Street and unsignalized intersection of Main Street and Snider Road and Killaly Street and Elizabeth Street, following recommendations are provided for the 2031, 2036 and 2041 horizon years:

- Highway 140/Elizabeth Street and Main Street
 - Optimize signal timings and provide a cycle length of 120 seconds.
 - Provide dual southbound left-turn lanes with protected left-turn phase.
 - Provide protected/permissive phase for eastbound left and northbound left movements.
- Main Street and Snider Road
 - Signalize intersection per signal warrant.
 - Provide an eastbound right-turn auxiliary lane with 60 metre storage and 55 metre taper.
- Killaly Street and Elizabeth Street
 - Provide All-Way Stop Control at the intersection to improve traffic operations and to support pedestrian movements.

The performance metrics below shows the intersection operations with recommended improvements.

Appendix Q contains the 2041 future total detailed capacity analysis per the above proposed recommendations.

The analysis focused primarily on the 2041 future total scenario, acknowledged as the worst-case scenario, in conjunction with the aforementioned recommendations. It is anticipated that the study road network will only operate better in the 2031 and 2036 horizon years compared to the conditions expected in the 2041 horizon year (worst-case scenario).

5.5.1 Highway 140/Elizabeth Street and Main Street

Table 21 shows the comparison between the unoptimized and optimized signalized intersection for the 2041 future total scenario.

Table 22 shows the queuing assessment comparison between the unoptimized and optimized intersection for the 2041 future total scenario.

Table 21: 2041 Future Total Signalized Intersection Comparison

Intersection	Movement	Performance Metrics					
		Previous			Improved		
		LOS	Delay	V/C Ratio	LOS	Delay	V/C Ratio
A.M.							
Highway 140/Elizabeth Street and Main Street (Signalized)	Overall	C	22.9	0.90	B	16.0	0.69
	EBL	E	65.5	0.90	B	10.8	0.58
	EBT	B	18.6	0.43	B	10.2	0.40
	EBR	A	3.6	0.23	A	2.7	0.08
	WBL	B	15.6	0.19	C	16.3	0.10
	WBT	D	35.6	0.85	D	22.9	0.61
	WBR	A	6.3	0.40	B	3.2	0.12
	NBL	C	23.0	0.47	C	25.9	0.26
	NBTR	C	21.8	0.52	E	27.4	0.53
	SBL	C	22.3	0.37	E	30.4	0.43
	SBT	B	18.5	0.29	D	27.8	0.42
	SBR	A	4.5	0.34	B	9.7	0.69
	P.M.						
	Overall	F	101.9	2.09	D	54.9	0.99
	EBL	C	33.0	0.84	E	73.2	0.99
	EBT	B	18.5	0.58	C	30.1	0.62
	EBR	A	3.5	0.17	A	4.1	0.18
	WBL	C	21.4	0.13	D	35.8	0.15
	WBT	D	41.5	0.83	E	77.4	0.96
	WBR	A	9.5	0.41	C	21.5	0.49
NBL	F	158.4	1.10	C	31.1	0.52	
NBTR	C	30.5	0.68	E	79.6	0.95	
SBL	F	525.3	2.09	E	69.9	0.89	
SBT	E	68.5	1.00	E	65.3	0.95	
SBR	B	19.9	0.72	C	31.5	0.74	
Saturday							
Overall	C	33.8	0.98	D	41.3	0.89	
EBL	E	79.5	0.98	D	45.3	0.83	
EBT	C	22.4	0.61	C	27.2	0.56	
EBR	A	3.5	0.32	A	3.9	0.30	
WBL	B	16.1	0.21	C	31.0	0.22	
WBT	C	23.4	0.66	D	47.8	0.82	
WBR	A	5.1	0.31	B	16.0	0.39	
NBL	F	80.6	0.98	E	56.7	0.89	
NBTR	C	23.3	0.57	E	55.1	0.84	
SBL	E	76.5	0.98	E	65.6	0.80	
SBT	C	26.1	0.65	D	53.1	0.85	
SBR	A	8.0	0.32	B	17.4	0.42	

Table 22: 2041 Future Total Queuing Assessment Comparison

Intersection	Movement	Performance Metrics						Auxiliary Lane Storage Length (m)
		95 th Percentile Queue Length (m) [50 th Percentile Queue Length (m)]						
		AM		PM		SAT		
		Previous	Improved	Previous	Improved	Previous	Improved	
Hwy 140/Elizabeth Street and Main Street (Signal)	EBL	65 [25]	80 [30]	65 [30]	120 [60]	85 [40]	85 [35]	115
	EBR	10 [0]	15 [0]	10 [5]	10 [0]	15 [0]	15 [0]	110
	WBL	20 [10]	25 [10]	15 [5]	20 [10]	15 [10]	25 [15]	100
	WBR	25 [10]	45 [20]	25 [10]	50 [25]	20 [5]	45 [20]	30
	NBL	45 [25]	45 [30]	50 [20]	25 [15]	85 [40]	70 [35]	100
	SBL	30 [15]	25 [15]	175 [120]	90 [60]	100 [45]	60 [35]	115
	SBR	15 [0]	25 [5]	65 [30]	100 [60]	25 [10]	40 [20]	25

Upon the intersection optimization and implementation of dual southbound left-turn lanes, the overall intersection operations are expected to improve with improved Level of Service in the Weekday A.M. and P.M. peak hours and overall Volume-to-capacity ratios expected to reduce as well. The overall Level of Service is expected to deteriorate to “D” in the Weekend peak hour, however the volume-to-capacity ratio is expected to reduce from 0.98 to 0.89.

As per the queuing assessment comparison, the 95th percentile queue length for westbound right lane is expected to exceed the storage of 30 metres. However, the 50th percentile queue length is expected to operate under storage. The right-turn channelized lane is expected to suffice the 95th percentile queue length.

The 95th percentile queue length for southbound right-turn is expected to exceed the storage. However, the right-turn channelized lane is expected to suffice the 95th percentile queue length and the remaining queues can be accommodated in the taper.

5.5.2 Main Street and Snider Road

The intersection of Main Street and Snider Street was signalized, and the intersection improvements are provided in **Table 23** below:

Table 23: 2041 Future Total Intersection Comparison - Main Street and Snider Road

Intersection	Movement	Performance Metrics					
		Previous			Improved		
		LOS	Delay	V/C Ratio	LOS	Delay	V/C Ratio
Main Street and Snider Road (Signal)	A.M.						
	Overall	F	178.4	1.24	B	19.8	0.83
	EBLT	A	0.0	0.00	B	13.0	0.54
	EBR	-	-	-	A	2.5	0.11
	WBLTR	A	0.1	0.00	C	24.4	0.83
	NBLTR	F	178.4	1.24	C	24.2	0.66
	SBLTR	B	11.4	0.00	A	0.0	0.00
	P.M.						
	Overall	F	302.8	1.58	B	14.3	0.72
	EBLT	A	0.0	0.00	B	14.6	0.64
	EBR	-	-	-	A	2.3	0.37
	WBLTR	A	1.5	0.06	B	13.6	0.60
	NBLTR	F	302.8	1.58	D	35.2	0.72
	SBLTR	B	11.4	0.00	A	0.0	0.00
	Saturday						
	Overall	F	351.3	1.59	B	16.6	0.77
	EBLT	A	0.0	0.00	C	22.5	0.77
	EBR	-	-	-	A	3.3	0.43
	WBLTR	F	1.7	0.03	C	20.7	0.75
NBLTR	A	351.3	1.59	B	15.7	0.54	
SBLTR	B	11.2	0.00	A	0.0	0.00	

It can be observed that the intersection is expected to operate with an overall Level of Service "B" with a maximum volume-to-capacity ratio of 0.83 in the Weekday A.M. peak hour with minimum delays.

5.5.3 Killaly Street and Elizabeth Road

The intersection of Killaly Street and Elizabeth Street was treated with an All-Way Stop Control, and the intersection improvements are provided in **Table 24** below:

Table 24: 2041 Future Total Intersection Comparison – Killaly Street and Elizabeth Street

Intersection	Movement	Performance Metrics					
		Previous			Improved		
		LOS	Delay	V/C Ratio	LOS	Delay	V/C Ratio
Main Street and Snider Road (Signal)	A.M.						
	Overall	D	27.0	0.58	C	17.8	0.65
	EBLTR	A	3.2	0.10	C	15.4	0.56
	WBLTR	A	0.1	0.00	C	17.8	0.65
	NBLTR	C	19.7	0.14	A	10.0	0.07
	SBLTR	D	27.0	0.58	B	11.9	0.35
	P.M.						
	Overall	C	20.0	0.50	B	11.4	0.40
	EBLT	A	3.2	0.08	B	11.4	0.40
	WBLTR	A	0.3	0.01	B	10.5	0.34
	NBLTR	C	15.8	0.08	A	9.0	0.05
	SBLTR	C	20.0	0.50	B	10.8	0.34
	Saturday						
	Overall	D	27.9	0.67	B	12.6	0.45
	EBLT	A	3.0	0.07	B	12.0	0.40
	WBLTR	A	0.2	0.01	B	11.8	0.41
	NBLTR	C	15.4	0.09	A	9.3	0.05
SBLTR	D	27.9	0.67	B	12.6	0.45	

It can be observed that the Level of Service is expected to improve in all the scenarios and delays are expected to decrease as well. Further to improve the pedestrian safety an All-Way Stop is recommended at the intersection.

6.0 Parking Review

Per the City of Port Colborne's Comprehensive Zoning y-Law 6575/30/18, April 2081, Section 03, single-detached, attached townhouse dwellings require one parking spaces per dwelling unit and the commercial blocks require minimum one space per 25 square metres GFA. The Draft Plan proposes single detached homes and townhomes throughout the subject lands as accessed by public streets and laneways.

A total of 250 parking spaces will be required for the commercial blocks and the subject development is anticipated to meet the minimum parking requirements. Specific details regarding the parking spaces will be provided as a part of subsequent applications.

7.0 Conclusion and Recommendations

The section below summarizes the findings and recommendations to improve the traffic operations in the study road network.

7.1 Conclusion

The findings contained herein analyzes the subject lands based on the most recent Draft Plan dated June 01, 2023, which proposed a total of 1,027 single detached units, 1,275 single attached units and approximately 6,250 square metres of commercial area.

Minor changes to the development statistics are not expected to materially impact the findings of this report, summarized as the following:

- The existing boundary network operates with a LOS "C" or better with minimal delays and well under capacity.
- The Snider Road between Main Street (Highway 3) and Killaly Street East as part of the proposed development and will be developed up to the urban standards and therefore has been included in the future horizons.
- Intersection analysis of the 2031, 2036 and 2041 future background traffic volumes indicate intersections are projected to operate with a Level of Service "B" or better except for the intersection of Highway 140/Elizabeth Street and Main Street, where the eastbound left-turn movement is expected to deteriorate to Level of Service "D" in the in Weekday P.M. peak hour in the years 2031 and 2036 and Level of Service "F" in in the year 2041 with a volume-to-capacity ratio of 1.02 and delay of 81.9 seconds.
- The subject site is expected to generate a total of 1332 (369 inbound and 963 outbound) two-way trips during the weekday A.M. peak hour, 1730 (1043 inbound and 687 outbound) two-way trips during the weekday P.M. peak hour and 1756 (914 inbound and 842 outbound) two-way trips during the weekend peak hour.
- Intersection analysis of 2031 future total traffic volumes indicate:
 - Unsignalized intersections are projected to operate with a Level of Service "C" or better. Although the northbound shared left/through/right movement at Main Street and Snider Road is forecasted to operate poorly with a Level of Service "F" in all the peak hours with a minimum volume to capacity ratio of at 0.88 and delay of 158.2 seconds in the Weekday P.M. peak hour and 166.1 seconds in the Weekend peak hour. The southbound shared left/through/right movement at Killaly Street and Elizabeth Street is expected to operate with a Level of Service "D" in the Weekday A.M. and Weekend peak hours.
 - The signalized intersection of Highway 140/Elizabeth Street and Main Street is expected to deteriorate to an overall Level of Service "F" and "C" in the Weekday P.M. and Weekend peak hours respectively. The northbound left, southbound left and southbound through movements are forecasted to poorly operate in the Weekday P.M. peak hour and the southbound left movement is forecasted to experience delay of approximately 497 seconds in the Weekend peak hour.

- The 95th percentile queue length for southbound left-turn and southbound right-turn at the signalized intersection is expected to exceed the available storage as well in the Weekday P.M. peak hour.
- Intersection analysis of 2036 future total traffic volumes indicate:
 - The unsignalized intersections are forecasted to operate similar to the 2031 future total conditions and the northbound shared left/through/right movement at Main Street and Snider Road is forecasted to further deteriorate due to the projected volume growth along Main Street.
 - In addition to the 2031 future total conditions, the eastbound left and southbound left movements at Highway 140/Elizabeth Street and Main Street are forecasted to deteriorate to Level of Service "E" in the Weekend peak hour with an increase in delay of approximately 14 seconds.
- Intersection analysis of 2041 future total traffic volumes indicate:
 - The unsignalized intersections are forecasted to operate similar to the 2036 future total conditions and the northbound shared left/through/right movement at Main Street and Snider Road is forecasted to further deteriorate due to the projected volume growth along Main Street.
 - In addition to the 2036 future total conditions, the northbound left-movement at Highway 140/Elizabeth Street and Main Street is expected to deteriorate to Level of Service "F" with a volume-to-capacity ratio of 1.10 and 0.98 in the Weekday P.M. and Weekend peak hour respectively.
 - The 95th percentile queue length for southbound left-turn and southbound right-turn is expected to exceed the available storage in the Weekday P.M. peak hour.
- Based on the signal warrant conducted for the intersection of Snider Street and Main Street, the volumes align with Justifications 1A and 2B. Additionally, Justifications 1B and 2A are close to being met if the volumes materialize in the future scenario. Therefore, recommending signalization for the intersection is advisable to enhance operations, particularly on the minor approach.
- Based on the All-Way Stop Control warrant conducted for the intersection of Killaly Street and Elizabeth Street, the volumes in the average hourly volumes are close to the threshold and the Weekday P.M. peak hour volumes surpass the threshold. Therefore, an All-Wat Stop is recommended at the intersection.
- Per the City of Port Colborne's Comprehensive Zoning y-Law 6575/30/18, April 2081, Section 03, single-detached, attached townhouse dwellings require one parking spaces per dwelling unit and the commercial blocks require minimum one space per 25 square metres GFA. The subject development is anticipated to meet the residential and commercial parking supply.

7.2 Recommendations

The following recommendations are made for the study road network by this report as summarized below:

Horizon Year	Intersection/Segment	Improvements
2031	Highway 140/ Elizabeth Street and Main Street	<ul style="list-style-type: none"> • Signal Optimization • Implement dual southbound left-turn lanes with protected left phase
	Main Street and Snider Road	<ul style="list-style-type: none"> • Signalize intersection • Implement eastbound right-turn auxiliary lane with 60 metre storage and 55 metre taper
	Killaly Street and Elizabeth Street	<ul style="list-style-type: none"> • Implement All-Way Stop Control

- The intersection at Highway 140/Elizabeth Street and Main Street is set to see an overall improvement in its Level of Service due to the addition of dual southbound left-turn lanes. However, there's an expected decline to Level of Service "E" for northbound through/right and southbound left-lane traffic. Despite this, the volume-to-capacity ratios remain comfortably below critical levels, resulting in minimal delays. Specifically, during the Weekday P.M. peak hour, the volume-to-capacity ratio dropped to under 1:00, a significant improvement from the original scenario's ratio of 2.09.
- It's important to note that the growth rates are anticipated to surpass the standard 2% and the forecasted generated trips for the site are conservatively estimated, portraying a critical outlook for the 2041 total scenario. However, there's an understanding that conditions are expected to ameliorate in the future total scenarios of 2036 and 2031 due to proposed improvements.
- The intersection operations at Main Street and Snider Road and Killaly Street and Elizabeth Street are forecasted to significantly improve as well with the improvements.

The analysis undertaken herein was prepared using the most recent Draft Plan. Any minor changes to the Plan will not materially affect the conclusions contained within this report.

In conclusion, the proposed mixed-use residential/commercial development can be supported from a traffic operations and safety perspective.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.



Aarzo Dhanani, M. Eng, EIT
Engineering Intern, Transportation

BB/AD

C.F. CROZIER & ASSOCIATES INC.



Brandon Bradt, M. Eng., CEM, P. Eng.
Manager (Planning), Transportation

J:\2500\2578 - 705 Main, Elite Holdings\6905 - 806 Killaly Street E, Port Colborne\Reports\Transportation\2023.12.22 - Transportation Impact Study - 806 Killaly Street - Final.docx

APPENDIX A

Agency Correspondence

Aarzo Dhanani

From: Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>
Sent: Thursday, November 2, 2023 4:27 PM
To: Aarzo Dhanani; David Schulz; Paul.Nunes@ontario.ca
Cc: Aaron Wignall; Brandon Bradt
Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

Hello,

The Region has no further comments, we would like to advise that if you are using the Region's guidelines they have been updated and are accessible at:

<https://www.niagararegion.ca/business/default.aspx?topnav=1>

Thank you



Susan M. Dunsmore, P.Eng.

MANAGER, DEVELOPMENT ENGINEERING

Niagara Region, 1815 Sir Isaac Brock Way, Thorold, ON, L2V 4T7

P : (905) 980 - 6000 ext. 3661

W : www.niagararegion.ca

E : susan.dunsmore@niagararegion.ca



From: Aarzo Dhanani <adhanani@cfcrozier.ca>
Sent: Thursday, October 26, 2023 2:32 PM
To: David Schulz <David.Schulz@portcolborne.ca>; Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>; Paul.Nunes@ontario.ca
Cc: Aaron Wignall <awignall@cfcrozier.ca>; Brandon Bradt <bbradt@cfcrozier.ca>
Subject: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

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Hello,

C.F. Crozier and Associates Inc. (Crozier) has been retained to prepare a Transportation Impact Study (TIS) in support of the Draft Plan of Subdivision Application, Zoning By-Law Amendment, and Secondary Plan related to the proposed mixed-use development located at 806 Killaly Street in the City of Port Colborne, Niagara Region.

The subject site currently consists of vacant lands surrounded by Killaly Street East to the south, Main Street East (Highway 3) to the north, Elizabeth Street to the west, and Lorraine Road to the south. A small parcel is located to the southeast corner of Killaly Street East and Snider Road as well.

Please note that Snider Road passing through the proposed development is currently not developed to an Urban Standard and is not actively used for public traffic.

The development would be split into five parcels. According to the master plan, the element envisioned for this development include:

- A total of 2242 units consisting of single detached, lane-based townhouse, Street townhouse and Condominium townhouse
- A total of 2.43 ha of commercial area
- Accesses to the roadway and internal intersections

Please see the attached master plan for more details.

We are kindly requesting that you review the ToR and provide feedback regarding our scope of work and request for data.

Study Methodology for the Transportation Impact Study

The following intersections are proposed to be analyzed as part of the scope of the study:

- Main St. E. (Highway 3) at Lorraine Road/Babion Road
- Main St. E. (Highway 3) at Snider Road
- Main St. E. (Highway 3) at Highway 140/Elizabeth Street
- Killaly St. E. at Lorraine Road
- Killaly St. E. at Snider Road
- Killaly St. E. at Elizabeth Street
- All proposed accesses to the development and major internal intersections

We will consult specialty traffic counting firms we typically work with to obtain traffic data for the intersections listed above unless the City of Port Colborne, Niagara Region or MTO has data for these intersections. If the data is available and preferred, please let us know. **Please confirm the above noted intersections are sufficient for the study.**

Analysis Periods and Scenarios

It is proposed that the TIS include weekday A.M. and P.M. peak hours. The peak hours identified would be analyzed for the following assumed time horizons: Full build-out, Five years from build-out and 10-years from build-out.

Please note that the development phasing is currently unknown. If we become aware of the phasing, we will add horizon years for the respective phases.

The horizon years will be analyzed for future background and total traffic conditions. **Please confirm if the peak hour periods and the horizon year is sufficient for the analysis.**

Background Developments

Please confirm if any background development should be included in the analysis. If there are developments that need to be considered, please provide the associated transportation impact studies that should be included in our analysis.

Roadway and Transit Improvements

Please confirm and please provide us with details of the expected roadway changes within the study area network.

Traffic Growth

We kindly request a recommended growth rate applicable to traffic volumes in the study area, to sufficiently reflect future conditions in the horizon years.

Please provide the growth rate that can be used for Highway 3 (Main Street East), Killaly Street East, Elizabeth Road, Lorraine Road and Babion Road, or alternatively any historical data that can be used to calculate the growth rate in combination with the existing traffic data.

Trip Generation and Distribution

Trip generation for the proposed development will be forecasted using the Trip Generation Manual, 11th Edition, prepared by the Institute of Transportation Engineers (ITE). Single-Family Detached Housing (Land Use Code 210), Single-Family Attached Housing (Land Use Code 215) and Multi-Family Housing Low-Rise (Land Use Code 220) will be used to calculate the trips. **Please confirm if this is acceptable.**

Existing traffic and data from the 2016 Transportation Tomorrow Survey (TTS) will be used to determine the trip distribution for the A.M. and P.M. periods to the proposed development. **Please confirm if this is acceptable.**

Analysis Procedures

Weekday A.M. and P.M. peak hours will be analyzed using Synchro 11.0 analysis software based on Highway Capacity Manual (HCM) procedures. **Please confirm if this is acceptable.**

Site Accesses and Internal Roadway Review

The number and location of the proposed accesses will be assessed in accordance with the requirements set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), as well as the MTO TAC Supplement.

Parking Review

The parking supply at the proposed site will be reviewed and compared with the City of Port Colborne's "Comprehensive Zoning By-Law 6575/30/18, April 2018, Section 03". The review will determine whether the proposed parking supply at the site is sufficient to meet the City's By-Law requirements.

Summary

We request the following information for inclusion in the study, along with any comments that arise with regards to the above Terms of Reference.

Please provide:

- Confirmation that the intersections of study are sufficient.
- Relevant growth rate(s) applicable to the roadways of study.
- Confirm the study horizon years are acceptable.
- Any relevant background developments and the associated traffic impact studies that are to be included in our analysis.
- Provide details of any planned roadway or transit improvements in the surrounding study area within the horizon years, if there are any.

I hope the contents outlined in this email are acceptable. Should you not be the appropriate person for correspondence, it would be appreciated to be directed to the appropriate contact.

Please feel free to contact us if you have any questions or require further information.

Kind Regards,

Aarzo Dhanani

Aarzo Dhanani, M.Eng., EIT
Engineering Intern, Transportation
Office: 416.477.3392
Collingwood | Milton | Toronto | Bradford | Guelph



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Aarzo Dhanani

From: David Schulz <David.Schulz@portcolborne.ca>
Sent: Friday, November 10, 2023 4:06 PM
To: Brandon Bradt; Ted Lagakos
Cc: Amirpour, Siavash (MTO); Nunes, Paul (MTO); Pillay, David (MTO); Aaron Wignall; Aarzo Dhanani
Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)
Attachments: 18. Traffic Impact Study, IBI, 19Oct20.pdf

Hi Brandon,

Ted can correct me if I am wrong, but I believe the MTO is not in a position to provide comments on the ToR until the proposed site design meets their criteria.

I would think from a City perspective, we would be supportive of the MTO downloading this area of the highway in order to better support the development from an access and planning perspective, however I am not sure how those logistics would be worked out. I am open to keeping the discussion going with respect to that.

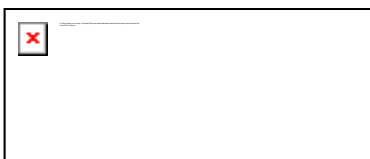
The Snider Road road allowance is still in place and would be supported to be used at minimum to access the site.

Please find the TIS for the Port Colborne Quarries expansion attached. This development is still very relevant. Council will be making a decision on the land use for the expansion on Tuesday.

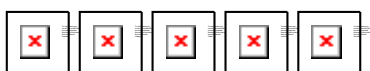
I hope this helps.

Regards,

David



David Schulz BURPI, MCIP, RPP
Senior Planner
City of Port Colborne



66 Charlotte Street
Port Colborne, ON L3K 3C8

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From: Brandon Bradt <bbradt@cfcrozier.ca>

Sent: Wednesday, November 8, 2023 1:35 PM

To: David Schulz <David.Schulz@portcolborne.ca>; Ted Lagakos <ted.lagakos@ontario.ca>

Cc: Amirpour, Siavash (MTO) <Siavash.Amirpour@ontario.ca>; Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>; Pillay, David (MTO) <David.Pillay@ontario.ca>; Aaron Wignall <awignall@cfcrozier.ca>; Aarzo Dhanani <adhanani@cfcrozier.ca>

Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

Thanks David,

We note that the email you attached from Ted is from 2021. Should we assume the MTO doesn't wish to change anything within that given the TOR we sent? We note that no confirmation has been provided on the study area network we proposed as well, which we will need as soon as possible so that we can schedule traffic counts.

We also understand that the accesses as currently proposed do not meet ministry guidelines, was there any discussion between yourself and Ted on whether this portion of Main Street would eventually be transferred to out of MTO ownership similar to Main Street west of Highway 140 given the proposed development would effectively expand the urbanized area of Port Colborne? This will be key in us going back to our client to refine the draft plan.

Can we assume that the Snider Road alignment as shown within the City's current ROW is acceptable? This is also a major piece of the draft plan we need to confirm.

Lastly, is there anything you can share on the Port Colborne Quarries expansion mentioned in Ted's email? TIS report etc, assuming that development is still relevant?

Kind Regards,

Brandon

Brandon Bradt, M.Eng. CEM, P.Eng.

Manager (Planning), Transportation

Office: 416.477.3392

Collingwood | Milton | Toronto | Bradford | Guelph



From: David Schulz <David.Schulz@portcolborne.ca>
Sent: Wednesday, November 8, 2023 11:06 AM
To: Ted Lagakos <ted.lagakos@ontario.ca>; Aarzoo Dhanani <adhanani@cfcrozier.ca>
Cc: Amirpour, Siavash (MTO) <Siavash.Amirpour@ontario.ca>; Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>; Pillay, David (MTO) <David.Pillay@ontario.ca>; Brandon Bradt <bbradt@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>
Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

Hi Aarzoo and Ted,

I sent a response on Monday this week based on my conversation with Ted.

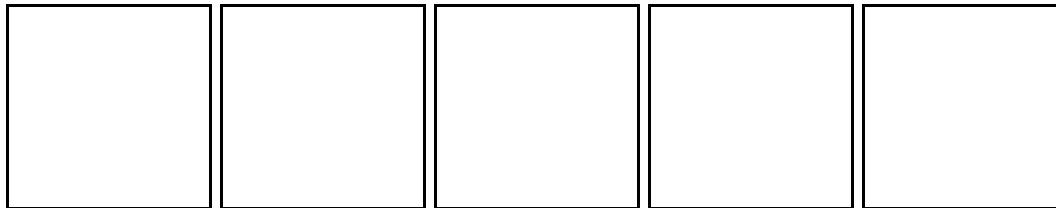
I have attached it to this email.

Thanks,

David



David Schulz BURPI, MCIP, RP
Senior Planner
City of Port Colborne



66 Charlotte Street
Port Colborne, ON L3K 3C8
Phone 905-835-2900 x202
Email David.Schulz@portcolborne.ca

www.portcolborne.ca

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From: Lagakos, Ted (MTO) <Ted.Lagakos@ontario.ca>
Sent: Wednesday, November 8, 2023 10:57 AM
To: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Cc: Amirpour, Siavash (MTO) <Siavash.Amirpour@ontario.ca>; Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>; Pillay,

David (MTO) <David.Pillay@ontario.ca>; Brandon Bradt <bbradt@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>;
David Schulz <David.Schulz@portcolborne.ca>

Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

Afternoon Aarzo,

I spoke directly with David at the municipality and they will be getting back to you regarding this request.

Ted Lagakos | Senior Project Manager (West)

Highway Corridor Management Section | Central Operations | Ministry of Transportation
159 Sir William Hearst Avenue, 7th Floor, Toronto, ON. M3M 0B7
Telephone: 416-268-3932 | Email: ted.lagakos@ontario.ca



From: Aarzo Dhanani <adhanani@cfcrozier.ca>

Sent: November 8, 2023 10:45 AM

To: Lagakos, Ted (MTO) <Ted.Lagakos@ontario.ca>

Cc: Amirpour, Siavash (MTO) <Siavash.Amirpour@ontario.ca>; Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>; Pillay, David (MTO) <David.Pillay@ontario.ca>; Brandon Bradt <bbradt@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>

Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

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Good morning Ted,

Hope you are doing well!

I'm just following up to see if you've had the meeting with the Town? We are seeking to obtain traffic signal timing data for the intersection of Main St. E. (Highway 3) at Highway 140/Elizabeth Street as well. Please let us know if you'd like us to contact the appropriate source for obtaining this data.

Furthermore, could you confirm whether the selected study intersections are suitable in the meantime? We would like to proceed with scheduling the traffic counts.

Kind Regards,

Aarzo

Aarzo Dhanani, M.Eng., EIT
Engineering Intern, Transportation
Office: 416.477.3392
Collingwood | Milton | Toronto | Bradford | Guelph

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From: Brandon Bradt <bbradt@cfcrozier.ca>
Sent: Wednesday, November 1, 2023 2:45 PM
To: Ted Lagakos <ted.lagakos@ontario.ca>
Cc: Amirpour, Siavash (MTO) <Siavash.Amirpour@ontario.ca>; Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>; Pillay, David (MTO) <David.Pillay@ontario.ca>; Aaron Wignall <awignall@cfcrozier.ca>; Aarzoo Dhanani <adhanani@cfcrozier.ca>
Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

Makes sense, we'll take this back to the team in the meantime too.

I'll likely give you a ring once I've had a chance to discuss internally.

Cheers,

Brandon

Brandon Bradt, M.Eng. CEM, P.Eng.
Manager (Planning), Transportation
Office: 416.477.3392
Collingwood | Milton | Toronto | Bradford | Guelph

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From: Lagakos, Ted (MTO) <Ted.Lagakos@ontario.ca>
Sent: Wednesday, November 1, 2023 9:31 AM
To: Brandon Bradt <bbradt@cfcrozier.ca>
Cc: Amirpour, Siavash (MTO) <Siavash.Amirpour@ontario.ca>; Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>; Pillay, David (MTO) <David.Pillay@ontario.ca>; Aaron Wignall <awignall@cfcrozier.ca>; Aarzoo Dhanani <adhanani@cfcrozier.ca>
Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

Morning,

I would like to have a discussion with the Town first as this is a municipal led process that we participate in before having a possible follow up meeting.

You can call me directly if you want to discuss further.

Take care,

Ted Lagakos | Senior Project Manager (West)

Highway Corridor Management Section | Central Operations | Ministry of Transportation
159 Sir William Hearst Avenue, 7th Floor, Toronto, ON. M3M 0B7
Telephone: 416-268-3932 | Email: ted.lagakos@ontario.ca



From: Brandon Bradt <bbradt@cfcrozier.ca>
Sent: November 1, 2023 9:23 AM
To: Lagakos, Ted (MTO) <Ted.Lagakos@ontario.ca>
Cc: Amirpour, Siavash (MTO) <Siavash.Amirpour@ontario.ca>; Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>; Pillay, David (MTO) <David.Pillay@ontario.ca>; Aaron Wignall <awignall@cfcrozier.ca>; Aarzo Dhanani <adhanani@cfcrozier.ca>
Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

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Good Morning Ted,

Thanks for the quick response on this. Would it be appropriate to have call between the MTO, Town and yourself to discuss this issue? The applicant would like to submit the application before the end of the year so I'm thinking this may be the fastest path forward to make sure we're proposing something that can be supported by the MTO.

Let me know if that makes sense.

Kind Regards,

Brandon

Brandon Bradt, M.Eng. CEM, P.Eng.
Manager (Planning), Transportation
Office: 416.477.3392
Collingwood | Milton | Toronto | Bradford | Guelph

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From: Lagakos, Ted (MTO) <Ted.Lagakos@ontario.ca>
Sent: Wednesday, November 1, 2023 9:10 AM

To: Aarzoo Dhanani <adhanani@cfcrozier.ca>

Cc: Brandon Bradt <bbradt@cfcrozier.ca>; Amirpour, Siavash (MTO) <Siavash.Amirpour@ontario.ca>; Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>; Pillay, David (MTO) <David.Pillay@ontario.ca>

Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

Morning Aarzoo,

This is a follow up to my recent voicemail.

Comments on your TOR/preparation of a traffic study is premature at this time as the site does not comply with the ministry's access management policies (e.g. access onto Hwy 3 is not permitted). Until the access issues are resolved to our satisfaction, we cannot support this site moving forward.

Note that I have already sent an email to David at the Town to discuss the access issue further.

Please do not hesitate to call me at the number below if you have any further questions.

Take care,

Ted Lagakos | Senior Project Manager (West)

Highway Corridor Management Section | Central Operations | Ministry of Transportation
159 Sir William Hearst Avenue, 7th Floor, Toronto, ON. M3M 0B7
Telephone: 416-268-3932 | Email: ted.lagakos@ontario.ca



From: Aarzoo Dhanani <adhanani@cfcrozier.ca>

Sent: November 1, 2023 8:50 AM

To: Lagakos, Ted (MTO) <Ted.Lagakos@ontario.ca>

Cc: Brandon Bradt <bbradt@cfcrozier.ca>

Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

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Good morning Mr. Ted,

Hope you are doing well!

I wish to follow up on the Terms of Reference below for the site located at 806 Killaly Street East in the City of Port Colborne, Niagara Region. We are in the process of putting together a Transportation Impact Study and would greatly appreciate if you could provide prompt feedback due to pressing project timelines.

Should you have any concerns or questions, please do not hesitate to reach out to us.

Thank you for your attention to this matter.

Kind Regards,

Aarzoo

Aarzo Dhanani, M.Eng., EIT
Engineering Intern, Transportation
Office: 416.477.3392
Collingwood | Milton | Toronto | Bradford | Guelph

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From: Aarzo Dhanani
Sent: Thursday, October 26, 2023 4:08 PM
To: Ted Lagakos <ted.lagakos@ontario.ca>
Cc: Brandon Bradt <bbradt@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>
Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

Good afternoon Ted,

Regarding the Terms of Reference below, could you please review them and let us know if you have any questions!

Kind Regards,

Aarzo

From: Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>
Sent: Thursday, October 26, 2023 3:43 PM
To: Aarzo Dhanani <adhanani@cfcrozier.ca>
Cc: David Schulz <David.Schulz@portcolborne.ca>; 'Dunsmore, Susan' <Susan.Dunsmore@niagararegion.ca>
Subject: RE: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

Hello Aarzo,

Please redirect this email to Mr. Ted Lagakos, the MTO Senior Project Manager for the Region of Niagara.

Ted Lagakos | Senior Project Manager (West)
Highway Corridor Management Section | Central Operations | Ministry of Transportation
Telephone: 416-268-3932 | Email: ted.lagakos@ontario.ca

Thanks,

PaulN

From: Aarzo Dhanani <adhanani@cfcrozier.ca>
Sent: October 26, 2023 2:32 PM
To: david.schulz@portcolborne.ca; Susan.Dunsmore@niagararegion.ca; Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>

Cc: Aaron Wignall <awignall@cfcrozier.ca>; Brandon Bradt <bbradt@cfcrozier.ca>

Subject: 806 Killaly St E - Transportation Impact Study - Terms of Reference CFC(#2578-6905)

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hello,

C.F. Crozier and Associates Inc. (Crozier) has been retained to prepare a Transportation Impact Study (TIS) in support of the Draft Plan of Subdivision Application, Zoning By-Law Amendment, and Secondary Plan related to the proposed mixed-use development located at 806 Killaly Street in the City of Port Colborne, Niagara Region.

The subject site currently consists of vacant lands surrounded by Killaly Street East to the south, Main Street East (Highway 3) to the north, Elizabeth Street to the west, and Lorraine Road to the south. A small parcel is located to the southeast corner of Killaly Street East and Snider Road as well.

Please note that Snider Road passing through the proposed development is currently not developed to an Urban Standard and is not actively used for public traffic.

The development would be split into five parcels. According to the master plan, the element envisioned for this development include:

- A total of 2242 units consisting of single detached, lane-based townhouse, Street townhouse and Condominium townhouse
- A total of 2.43 ha of commercial area
- Accesses to the roadway and internal intersections

Please see the attached master plan for more details.

We are kindly requesting that you review the ToR and provide feedback regarding our scope of work and request for data.

Study Methodology for the Transportation Impact Study

The following intersections are proposed to be analyzed as part of the scope of the study:

- Main St. E. (Highway 3) at Lorraine Road/Babion Road
- Main St. E. (Highway 3) at Snider Road
- Main St. E. (Highway 3) at Highway 140/Elizabeth Street
- Killaly St. E. at Lorraine Road
- Killaly St. E. at Snider Road
- Killaly St. E. at Elizabeth Street
- All proposed accesses to the development and major internal intersections

We will consult specialty traffic counting firms we typically work with to obtain traffic data for the intersections listed above unless the City of Port Colborne, Niagara Region or MTO has data for these intersections. If the data is available and preferred, please let us know. **Please confirm the above noted intersections are sufficient for the study.**

Analysis Periods and Scenarios

It is proposed that the TIS include weekday A.M. and P.M. peak hours. The peak hours identified would be analyzed for the following assumed time horizons: Full build-out, Five years from build-out and 10-years from build-out.

Please note that the development phasing is currently unknown. If we become aware of the phasing, we will add horizon years for the respective phases.

The horizon years will be analyzed for future background and total traffic conditions. **Please confirm if the peak hour periods and the horizon year is sufficient for the analysis.**

Background Developments

Please confirm if any background development should be included in the analysis. If there are developments that need to be considered, please provide the associated transportation impact studies that should be included in our analysis.

Roadway and Transit Improvements

Please confirm and please provide us with details of the expected roadway changes within the study area network.

Traffic Growth

We kindly request a recommended growth rate applicable to traffic volumes in the study area, to sufficiently reflect future conditions in the horizon years.

Please provide the growth rate that can be used for Highway 3 (Main Street East), Killaly Street East, Elizabeth Road, Lorraine Road and Babion Road, or alternatively any historical data that can be used to calculate the growth rate in combination with the existing traffic data.

Trip Generation and Distribution

Trip generation for the proposed development will be forecasted using the Trip Generation Manual, 11th Edition, prepared by the Institute of Transportation Engineers (ITE). Single-Family Detached Housing (Land Use Code 210), Single-Family Attached Housing (Land Use Code 215) and Multi-Family Housing Low-Rise (Land Use Code 220) will be used to calculate the trips. **Please confirm if this is acceptable.**

Existing traffic and data from the 2016 Transportation Tomorrow Survey (TTS) will be used to determine the trip distribution for the A.M. and P.M. periods to the proposed development. **Please confirm if this is acceptable.**

Analysis Procedures

Weekday A.M. and P.M. peak hours will be analyzed using Synchro 11.0 analysis software based on Highway Capacity Manual (HCM) procedures. **Please confirm if this acceptable.**

Site Accesses and Internal Roadway Review

The number and location of the proposed accesses will be assessed in accordance with the requirements set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), as well as the MTO TAC Supplement.

Parking Review

The parking supply at the proposed site will be reviewed and compared with the City of Port Colborne's "Comprehensive Zoning By-Law 6575/30/18, April 2018, Section 03". The review will determine whether the proposed parking supply at the site is sufficient to meet the City's By-Law requirements.

Summary

We request the following information for inclusion in the study, along with any comments that arise with regards to the above Terms of Reference.

Please provide:

- Confirmation that the intersections of study are sufficient.
- Relevant growth rate(s) applicable to the roadways of study.
- Confirm the study horizon years are acceptable.

- Any relevant background developments and the associated traffic impact studies that are to be included in our analysis.
- Provide details of any planned roadway or transit improvements in the surrounding study area within the horizon years, if there are any.

I hope the contents outlined in this email are acceptable. Should you not be the appropriate person for correspondence, it would be appreciated to be directed to the appropriate contact.

Please feel free to contact us if you have any questions or require further information.

Kind Regards,

Aarzo Dhanani

Aarzo Dhanani, M.Eng., EIT
Engineering Intern, Transportation
Office: 416.477.3392
Collingwood | Milton | Toronto | Bradford | Guelph



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Aarzo Dhanani

From: Lagakos, Ted (MTO) <Ted.Lagakos@ontario.ca>
Sent: Tuesday, September 14, 2021 3:56 PM
To: David Schulz
Cc: Dutchak, Lance (MTO); Nunes, Paul (MTO); Hakomaki, Eric (MTO); Lawrence, Morgan (MTO)
Subject: RE: Port Colborne - Highway 3/Killaly Street East Secondary Plan - Traffic Terms of Reference

Afternoon David,

Thank you for bringing this issue to our attention. Paul Nunes forwarded this request to my attention for response.

The following are the ministry's comments:

Terms of Reference

- On other development proposals, the ministry has accepted the Region of Niagara SatFlow of 1750 and PHF of 0.92.
- The ministry is not favourable to the location of any school within 150m or fronting onto Highway 3.
- The use of Synchro / SimTraffic version 11 is acceptable.
- Include analysis period of Weekend Mid-day. Horizon years: 5 and 10 years after Full build-out / occupancy.
- Indicate phases of the development and expected completion / full occupancy of each phase, if applicable.
- For background growth, the ministry will accept volumes up to 2019 projected to the base year of analysis using an appropriate background growth rate.
- Background growth rate can be estimated from historical trends in AADTs, don't necessarily default to 2%.
- The TOR states 621 residential units are proposed. Please confirm how many commercial / institutional uses are proposed as well.
- The largest development in proximity is the Port Colborne Quarries expansion. Applicant is advised to contact the Town for details on this development.

Preliminary Comments on Proposed Concept

- In principle, the ministry has no objection to the proposed development.

- Subject lands are within the ministry's permit control limits (extends up to 800m from MTO property); hence, ministry permits will be required (e.g. grading/servicing, building and land use, etc..). Please make the proponent aware that MTO permits will need to be secured prior to the commencement of any on-site works.
- At this time, setbacks will be a minimum of 14.0m from all ministry lands (may change depending when proponent plans to start construction). No features which are essential to the overall viability of the site are permitted within the MTO 14.0m setback area. Essential features include, but are not limited to, buildings/structures (above or below grade), required parking spaces (required per the municipal zoning by-law), retaining walls, utilities (includes parking lot lighting), stormwater management features, snow storage, loading spaces, fire routes, essential landscaping, etc. Please note that non-essential parking may be located within the MTO 14.0m setback area and must be set back a minimum of 3m from the MTO property line. Information regarding the application process, forms and the policy can be found at the link:

<http://www.mto.gov.on.ca/english/engineering/management/corridor/building.shtml>

- As part of a future subdivision/site plan application process, MTO will most likely impose draft plan/site plan conditions/requirements for (i) engineering/internal road construction plans, (ii) lighting, (iii) drainage and, (iv) traffic. Please make the applicant aware that any required highway improvements, as a result of the subject development, will require the proponent to enter into a legal agreement with MTO. Proponent will be 100% responsible for all associated costs (design/construction, etc..).
- The following materials will most likely need to be submitted by the proponent to support MTO's draft plan conditions/requirements:
 - One (1) digital copy of the subdivision/site plan;
 - One (1) digital copy of the civil engineering plans, stamped and signed by a Professional Engineer of Ontario;
 - One (1) digital copy of a Stormwater Management Report, stamped and signed by a Professional Engineer of Ontario;
 - One (1) digital copy of the Traffic Impact Study, prepared by a RAQS qualified consultant, stamped and signed by a Professional Engineer of Ontario.
 - One (1) digital copy of the Landscape Plans.
 - One (1) digital copy of the Illumination Plan and associated materials. The Illumination Plan is to include:
 - To-scale plan showing the site location and the highway
 - Lighting layout showing pole/luminaire locations and orientation
 - Luminaire installation info such as mounting height, orientation angle, shielding info, etc.
 - Luminaire material info including catalog info and photometric data file
 - Lighting calculation plan showing horizontal illuminance levels at and beyond the MTO right-of-way in metric units of lux to 1 decimal place minimum
- Regarding light trespass onto MTO right-of-way, the ministry requires zero light trespass onto our right-of-way.
- MTO's 14.0 m setback line must be clearly and accurately illustrated on all plans. Also, non-essential parking within the 14.0 m setback must be clearly identified with a note on all plans.

- All plans/materials and/or technical submissions must adhere to MTO standards.
- All proposed accesses onto MTO lands/provincial highways must adhere to the ministry's "Highway Access Management Guidelines".

I trust that this is satisfactory at this time. Please do not hesitate to contact me if you have any questions.

Sincerely,
Ted Lagakos
Senior Project Manager (Niagara/Hamilton)
Highway Corridor Management Section - Central Operations

Ministry of Transportation
159 Sir William Hearst Avenue, 7th Floor
Toronto, ON M3M 0B7

Phone: 416-268-3932

E-Mail: ted.lagakos@ontario.ca

Web: www.mto.gov.on.ca/english/engineering/management/corridor

From: David Schulz <David.Schulz@portcolborne.ca>

Sent: August 20, 2021 9:38 AM

To: Nunes, Paul (MTO) <Paul.Nunes@ontario.ca>

Subject: Port Colborne - Highway 3/Killaly Street East Secondary Plan - Traffic Terms of Reference

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Paul,

Hope you are doing well!

We have received this traffic terms of reference regarding the anticipated secondary plan for the lands attached. I would appreciate if you could take a look and provide any commentary you may have from the MTO.

If you are not the correct contact for something like this, please advise who/where I should send it.

Please let me know if you have any questions.

Thanks,

David

David Schulz
Planner
City of Port Colborne

Phone 905-835-2900 Ext. 202

Email David.Schulz@portcolborne.ca

66 Charlotte Street
Port Colborne, ON L3K 3C8

www.portcolborne.ca



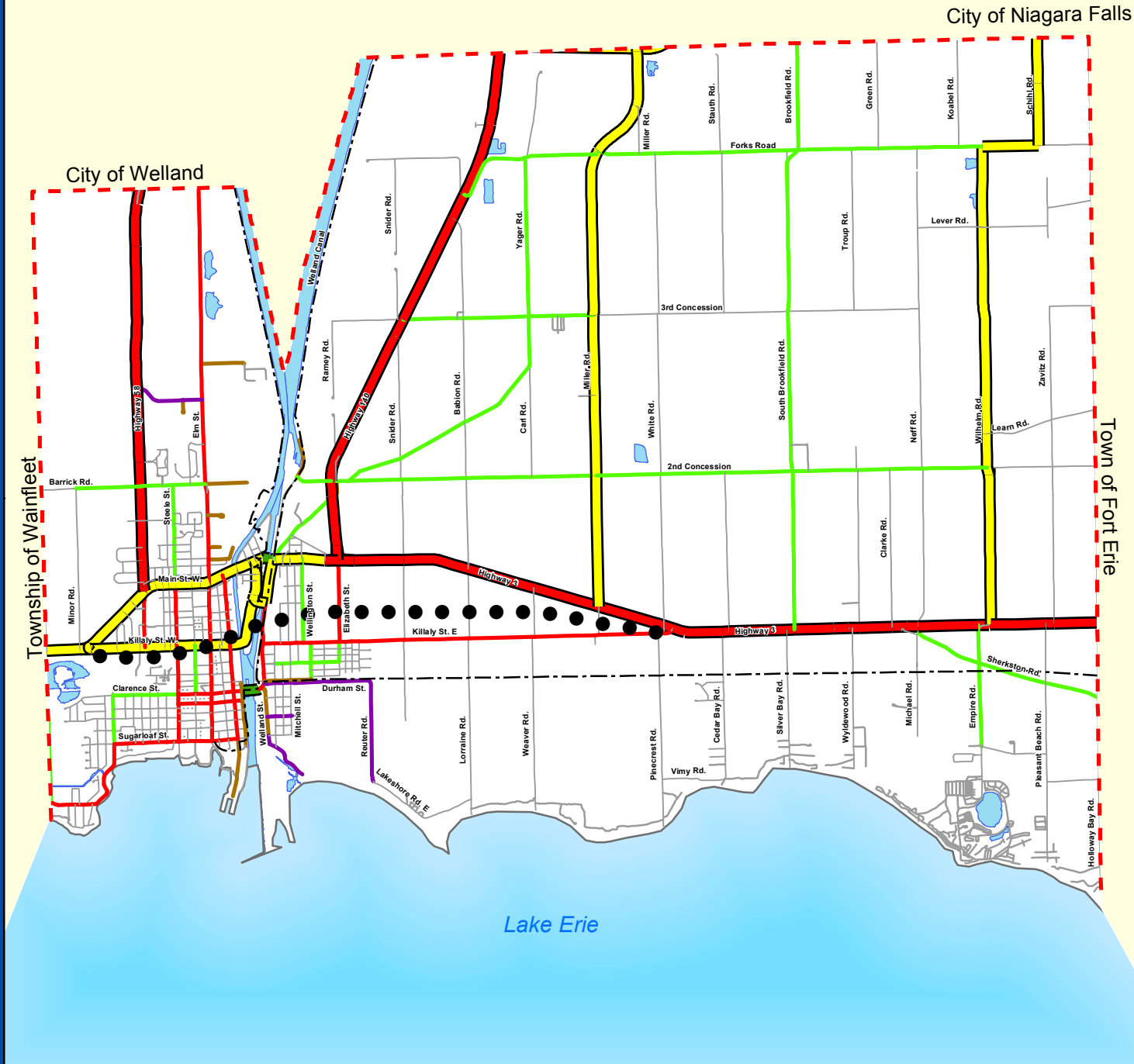
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APPENDIX B

Official Plan Excerpts

Port Colborne Official Plan

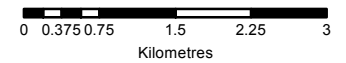
Schedule D: Transportation



- Municipal Boundary
 - Future Highway 3
 - Port Colborne Bike Trails
- Roads Classification**
- Laneway
 - Local Road
 - Local Commercial or Industrial
 - Arterial
 - Collector
 - Collector Commercial or Industrial
 - St. Lawrence Seaway
 - Regional
 - Provincial

Schedule Notes:

This map is for general illustration purposes only. For boundary interpretations please contact the City of Port Colborne Planning and Development Department.



1:75,000

APPENDIX C

Traffic Data



Turning Movement Count (1 . MAIN ST E & HWY 140 / ELIZABETH ST)

Start Time	N Approach HWY 140						E Approach MAIN ST E					S Approach ELIZABETH ST					W Approach MAIN ST E					Int. Total (15 min)	Int. Total (1 hr)				
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N			UTurn W:W	Peds W:	Approach Total	
07:00:00	27	10	3	0	0	40	12	22	9	0	0	43	10	27	8	0	0	45	3	30	32	0	0	65	193		
07:15:00	35	19	2	0	0	56	9	36	10	0	0	55	11	26	9	0	3	46	8	30	55	0	0	93	250		
07:30:00	35	14	3	0	0	52	14	37	10	0	0	61	5	42	16	0	0	63	10	47	56	0	0	113	289		
07:45:00	40	18	5	0	0	63	12	50	9	0	0	71	10	38	4	0	2	52	8	39	31	0	0	78	264	996	
08:00:00	35	22	8	0	0	65	15	41	12	0	0	68	14	33	14	0	0	61	3	19	22	0	0	44	238	1041	
08:15:00	39	18	5	0	0	62	13	43	9	0	0	65	10	37	15	0	0	62	5	29	34	0	0	68	257	1048	
08:30:00	39	22	5	0	0	66	14	40	8	0	0	62	7	24	15	0	2	46	5	36	19	0	0	60	234	993	
08:45:00	35	21	8	0	0	64	12	52	17	0	0	81	9	20	18	0	1	47	39	33	31	0	0	103	295	1024	
09:00:00	31	14	5	0	0	50	12	45	13	0	0	70	12	32	21	0	1	65	23	31	25	0	0	79	264	1050	
09:15:00	32	9	7	0	0	48	10	27	9	0	0	46	9	14	16	0	4	39	8	31	30	0	0	69	202	995	
09:30:00	30	15	7	0	0	52	9	42	3	0	0	54	10	13	17	0	1	40	8	22	22	0	0	52	198	959	
09:45:00	46	10	9	0	0	65	7	34	10	0	0	51	6	24	15	0	0	45	5	36	27	0	0	68	229	893	
BREAK																											
16:00:00	75	23	11	0	0	109	9	72	10	0	0	91	13	40	22	0	0	75	8	52	45	0	0	105	380		
16:15:00	79	22	13	0	0	114	11	67	6	0	0	84	11	30	13	0	0	54	12	65	52	0	0	129	381		
16:30:00	53	22	18	0	0	93	15	45	3	0	0	63	6	22	9	0	0	37	6	50	50	0	0	106	299		
16:45:00	70	27	20	0	0	117	10	45	2	0	0	57	7	32	9	0	0	48	11	44	43	0	0	98	320	1380	
17:00:00	72	23	10	0	0	105	12	44	4	0	0	60	7	36	10	0	0	53	9	42	44	0	0	95	313	1313	
17:15:00	53	19	19	0	0	91	5	38	6	0	0	49	4	25	13	0	0	42	9	42	45	0	0	96	278	1210	
17:30:00	73	18	7	0	0	98	14	37	5	0	0	56	6	13	6	0	0	25	5	48	22	0	2	75	254	1165	
17:45:00	42	24	12	0	0	78	4	35	4	0	0	43	2	14	15	0	0	31	16	30	27	0	0	73	225	1070	
18:00:00	48	25	6	0	0	79	7	32	7	0	0	46	5	18	9	0	0	32	9	56	39	0	0	104	261	1018	
18:15:00	47	16	6	0	0	69	3	30	7	0	0	40	5	13	9	0	0	27	11	37	31	0	0	79	215	955	
18:30:00	30	34	5	0	0	69	3	21	9	0	0	33	4	16	13	0	0	33	9	18	28	0	0	55	190	891	
18:45:00	27	11	8	0	0	46	9	19	5	0	0	33	6	16	8	0	0	30	8	19	16	0	0	43	152	818	
Grand Total	1093	456	202	0	0	1751	241	954	187	0	0	1382	189	605	304	0	14	1098	238	886	826	0	2	1950	6181	-	
Approach%	62.4%	26%	11.5%	0%		-	17.4%	69%	13.5%	0%		-	17.2%	55.1%	27.7%	0%		-	12.2%	45.4%	42.4%	0%		-	-	-	
Totals %	17.7%	7.4%	3.3%	0%		28.3%	3.9%	15.4%	3%	0%		22.4%	3.1%	9.8%	4.9%	0%		17.8%	3.9%	14.3%	13.4%	0%		31.5%	-	-	
Heavy	75	13	17	0		-	17	52	4	0		-	3	16	8	0		-	6	60	58	0		-	-	-	
Heavy %	6.9%	2.9%	8.4%	0%		-	7.1%	5.5%	2.1%	0%		-	1.6%	2.6%	2.6%	0%		-	2.5%	6.8%	7%	0%		-	-	-	
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	



Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)

Start Time	N Approach HWY 140						E Approach MAIN ST E						S Approach ELIZABETH ST						W Approach MAIN ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	39	18	5	0	0	62	13	43	9	0	0	65	10	37	15	0	0	62	5	29	34	0	0	68	257
08:30:00	39	22	5	0	0	66	14	40	8	0	0	62	7	24	15	0	2	46	5	36	19	0	0	60	234
08:45:00	35	21	8	0	0	64	12	52	17	0	0	81	9	20	18	0	1	47	39	33	31	0	0	103	295
09:00:00	31	14	5	0	0	50	12	45	13	0	0	70	12	32	21	0	1	65	23	31	25	0	0	79	264
Grand Total	144	75	23	0	0	242	51	180	47	0	0	278	38	113	69	0	4	220	72	129	109	0	0	310	1050
Approach%	59.5%	31%	9.5%	0%		-	18.3%	64.7%	16.9%	0%		-	17.3%	51.4%	31.4%	0%		-	23.2%	41.6%	35.2%	0%		-	-
Totals %	13.7%	7.1%	2.2%	0%		23%	4.9%	17.1%	4.5%	0%		26.5%	3.6%	10.8%	6.6%	0%		21%	6.9%	12.3%	10.4%	0%		29.5%	-
PHF	0.92	0.85	0.72	0		0.92	0.91	0.87	0.69	0		0.86	0.79	0.76	0.82	0		0.85	0.46	0.9	0.8	0		0.75	-
Heavy	20	2	7	0		29	7	19	2	0		28	1	6	1	0		8	6	14	11	0		31	-
Heavy %	13.9%	2.7%	30.4%	0%		12%	13.7%	10.6%	4.3%	0%		10.1%	2.6%	5.3%	1.4%	0%		3.6%	8.3%	10.9%	10.1%	0%		10%	-
Lights	124	73	16	0		213	44	161	45	0		250	37	107	68	0		212	66	115	98	0		279	-
Lights %	86.1%	97.3%	69.6%	0%		88%	86.3%	89.4%	95.7%	0%		89.9%	97.4%	94.7%	98.6%	0%		96.4%	91.7%	89.1%	89.9%	0%		90%	-
Single-Unit Trucks	8	2	3	0		13	5	9	0	0		14	0	0	1	0		1	1	9	1	0		11	-
Single-Unit Trucks %	5.6%	2.7%	13%	0%		5.4%	9.8%	5%	0%	0%		5%	0%	0%	1.4%	0%		0.5%	1.4%	7%	0.9%	0%		3.5%	-
Buses	0	0	1	0		1	1	4	2	0		7	1	4	0	0		5	5	4	2	0		11	-
Buses %	0%	0%	4.3%	0%		0.4%	2%	2.2%	4.3%	0%		2.5%	2.6%	3.5%	0%	0%		2.3%	6.9%	3.1%	1.8%	0%		3.5%	-
Articulated Trucks	12	0	3	0		15	1	6	0	0		7	0	2	0	0		2	0	1	8	0		9	-
Articulated Trucks %	8.3%	0%	13%	0%		6.2%	2%	3.3%	0%	0%		2.5%	0%	1.8%	0%	0%		0.9%	0%	0.8%	7.3%	0%		2.9%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	100%	-	-	-	-	-	0%	-	-



Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)

Start Time	N Approach HWY 140						E Approach MAIN ST E						S Approach ELIZABETH ST						W Approach MAIN ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:00:00	75	23	11	0	0	109	9	72	10	0	0	91	13	40	22	0	0	75	8	52	45	0	0	105	380
16:15:00	79	22	13	0	0	114	11	67	6	0	0	84	11	30	13	0	0	54	12	65	52	0	0	129	381
16:30:00	53	22	18	0	0	93	15	45	3	0	0	63	6	22	9	0	0	37	6	50	50	0	0	106	299
16:45:00	70	27	20	0	0	117	10	45	2	0	0	57	7	32	9	0	0	48	11	44	43	0	0	98	320
Grand Total	277	94	62	0	0	433	45	229	21	0	0	295	37	124	53	0	0	214	37	211	190	0	0	438	1380
Approach%	64%	21.7%	14.3%	0%		-	15.3%	77.6%	7.1%	0%		-	17.3%	57.9%	24.8%	0%		-	8.4%	48.2%	43.4%	0%		-	-
Totals %	20.1%	6.8%	4.5%	0%		31.4%	3.3%	16.6%	1.5%	0%		21.4%	2.7%	9%	3.8%	0%		15.5%	2.7%	15.3%	13.8%	0%		31.7%	-
PHF	0.88	0.87	0.78	0		0.93	0.75	0.8	0.53	0		0.81	0.71	0.78	0.6	0		0.71	0.77	0.81	0.91	0		0.85	-
Heavy	10	2	3	0		15	1	4	0	0		5	0	3	2	0		5	0	14	9	0		23	-
Heavy %	3.6%	2.1%	4.8%	0%		3.5%	2.2%	1.7%	0%	0%		1.7%	0%	2.4%	3.8%	0%		2.3%	0%	6.6%	4.7%	0%		5.3%	-
Lights	267	92	59	0		418	44	225	21	0		290	37	121	51	0		209	37	197	181	0		415	-
Lights %	96.4%	97.9%	95.2%	0%		96.5%	97.8%	98.3%	100%	0%		98.3%	100%	97.6%	96.2%	0%		97.7%	100%	93.4%	95.3%	0%		94.7%	-
Single-Unit Trucks	5	1	2	0		8	1	1	0	0		2	0	1	0	0		1	0	7	6	0		13	-
Single-Unit Trucks %	1.8%	1.1%	3.2%	0%		1.8%	2.2%	0.4%	0%	0%		0.7%	0%	0.8%	0%	0%		0.5%	0%	3.3%	3.2%	0%		3%	-
Buses	1	0	1	0		2	0	3	0	0		3	0	0	2	0		2	0	4	2	0		6	-
Buses %	0.4%	0%	1.6%	0%		0.5%	0%	1.3%	0%	0%		1%	0%	0%	3.8%	0%		0.9%	0%	1.9%	1.1%	0%		1.4%	-
Articulated Trucks	4	1	0	0		5	0	0	0	0		0	0	2	0	0		2	0	3	1	0		4	-
Articulated Trucks %	1.4%	1.1%	0%	0%		1.2%	0%	0%	0%	0%		0%	0%	1.6%	0%	0%		0.9%	0%	1.4%	0.5%	0%		0.9%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)





Turning Movement Count (1 . MAIN ST E & HWY 140 / ELIZABETH ST)

Start Time	N Approach HWY 140						E Approach MAIN ST E						S Approach ELIZABETH ST						W Approach MAIN ST E						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
10:00:00	27	15	5	0	0	47	7	55	8	0	0	70	7	22	31	0	0	60	12	34	42	0	0	88	265	
10:15:00	26	14	7	0	0	47	6	48	11	0	0	65	9	28	49	0	0	86	17	46	30	0	0	93	291	
10:30:00	41	22	3	0	0	66	12	37	11	0	0	60	10	30	18	0	0	58	15	35	38	0	0	88	272	
10:45:00	38	13	4	0	0	55	11	54	10	1	0	76	16	31	18	0	0	65	12	37	34	0	0	83	279	1107
11:00:00	33	13	5	0	0	51	9	47	8	0	0	64	11	19	23	0	0	53	16	27	25	0	0	68	236	1078
11:15:00	30	17	11	0	0	58	15	43	12	0	0	70	9	34	38	0	0	81	17	49	35	0	0	101	310	1097
11:30:00	38	17	6	0	0	61	14	45	8	0	0	67	8	17	20	0	0	45	18	54	34	0	0	106	279	1104
11:45:00	31	20	7	0	0	58	9	39	2	0	0	50	10	25	21	0	0	56	14	35	36	0	0	85	249	1074
12:00:00	31	14	6	0	0	51	11	42	7	0	0	60	9	19	17	0	0	45	9	36	45	0	0	90	246	1084
12:15:00	39	15	9	0	0	63	13	44	10	0	0	67	22	34	26	0	0	82	13	37	34	0	0	84	296	1070
12:30:00	29	15	4	0	0	48	10	45	9	0	0	64	5	21	28	0	0	54	10	50	39	0	0	99	265	1056
12:45:00	31	12	7	0	0	50	10	41	15	0	0	66	10	28	16	0	0	54	9	49	32	0	0	90	260	1067
13:00:00	49	17	16	0	0	82	13	42	4	0	0	59	6	24	19	0	0	49	6	40	27	0	1	73	263	1084
13:15:00	48	17	11	0	0	76	10	27	10	0	0	47	14	28	11	0	0	53	3	47	36	0	0	86	262	1050
13:30:00	32	14	14	0	0	60	13	33	5	0	0	51	7	37	29	0	0	73	5	42	39	0	0	86	270	1055
13:45:00	41	23	13	0	0	77	4	47	5	0	0	56	7	16	9	0	0	32	5	36	26	0	1	67	232	1027
Grand Total	564	258	128	0	0	950	167	689	135	1	0	992	160	413	373	0	0	946	181	654	552	0	2	1387	4275	-
Approach%	59.4%	27.2%	13.5%	0%	-	-	16.8%	69.5%	13.6%	0.1%	-	-	16.9%	43.7%	39.4%	0%	-	-	13%	47.2%	39.8%	0%	-	-	-	-
Totals %	13.2%	6%	3%	0%	-	22.2%	3.9%	16.1%	3.2%	0%	-	23.2%	3.7%	9.7%	8.7%	0%	-	22.1%	4.2%	15.3%	12.9%	0%	-	32.4%	-	-
Heavy	4	3	4	0	-	-	1	8	0	0	-	-	0	3	1	0	-	-	1	6	4	0	-	-	-	-
Heavy %	0.7%	1.2%	3.1%	0%	-	-	0.6%	1.2%	0%	0%	-	-	0%	0.7%	0.3%	0%	-	-	0.6%	0.9%	0.7%	0%	-	-	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 10:00 AM - 11:00 AM Weather: Overcast Clouds (1.02 °C)

Start Time	N Approach HWY 140						E Approach MAIN ST E						S Approach ELIZABETH ST						W Approach MAIN ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
10:00:00	27	15	5	0	0	47	7	55	8	0	0	70	7	22	31	0	0	60	12	34	42	0	0	88	265
10:15:00	26	14	7	0	0	47	6	48	11	0	0	65	9	28	49	0	0	86	17	46	30	0	0	93	291
10:30:00	41	22	3	0	0	66	12	37	11	0	0	60	10	30	18	0	0	58	15	35	38	0	0	88	272
10:45:00	38	13	4	0	0	55	11	54	10	1	0	76	16	31	18	0	0	65	12	37	34	0	0	83	279
Grand Total	132	64	19	0	0	215	36	194	40	1	0	271	42	111	116	0	0	269	56	152	144	0	0	352	1107
Approach%	61.4%	29.8%	8.8%	0%	-	-	13.3%	71.6%	14.8%	0.4%	-	-	15.6%	41.3%	43.1%	0%	-	-	15.9%	43.2%	40.9%	0%	-	-	-
Totals %	11.9%	5.8%	1.7%	0%	19.4%	3.3%	3.3%	17.5%	3.6%	0.1%	24.5%	3.8%	10%	10.5%	0%	24.3%	5.1%	5.1%	13.7%	13%	0%	31.8%	-		
PHF	0.8	0.73	0.68	0	0.81	0.75	0.75	0.88	0.91	0.25	0.89	0.66	0.9	0.59	0	0.78	0.82	0.83	0.86	0	0.95	-	-		
Heavy	0	3	0	0	3	0	4	0	0	0	4	0	0	0	0	0	0	0	3	0	0	0	3	-	
Heavy %	0%	4.7%	0%	0%	1.4%	0%	2.1%	0%	0%	1.5%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0.9%	-	
Lights	132	61	19	0	212	36	190	40	1	267	42	111	116	0	269	56	149	144	0	349	-	-			
Lights %	100%	95.3%	100%	0%	98.6%	100%	97.9%	100%	100%	98.5%	100%	100%	100%	0%	100%	100%	100%	100%	98%	100%	0%	0%	99.1%	-	
Single-Unit Trucks	0	3	0	0	3	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	-		
Single-Unit Trucks %	0%	4.7%	0%	0%	1.4%	0%	0.5%	0%	0%	0.4%	0%	0%	0%	0%	0%	0%	0%	0%	1.3%	0%	0%	0%	0.6%	-	
Articulated Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	1	0	0	0	1	-		
Articulated Trucks %	0%	0%	0%	0%	0%	0%	1.5%	0%	0%	1.1%	0%	0%	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0%	0.3%	-	
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	
Pedestrians%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	

Peak Hour: 10:00 AM - 11:00 AM Weather: Overcast Clouds (1.02 °C)





Turning Movement Count (2 . MAIN ST E & SNIDER RD)

Start Time	N Approach SNIDER RD						E Approach MAIN ST E					S Approach SNIDER RD					W Approach MAIN ST E					Int. Total (15 min)	Int. Total (1 hr)			
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N			UTurn W:W	Peds W:	Approach Total
07:00:00	0	0	0	0	0	0	0	40	0	0	0	40	0	0	1	0	0	1	0	41	0	0	0	41	82	
07:15:00	0	0	1	0	0	1	0	52	0	0	0	52	0	0	0	0	0	0	0	37	0	0	0	37	90	
07:30:00	2	0	0	0	0	2	0	56	0	0	0	56	0	0	0	0	0	0	0	48	1	0	0	49	107	
07:45:00	0	0	0	0	0	0	0	65	0	0	0	65	0	0	0	0	0	0	0	47	0	0	0	47	112	391
08:00:00	0	0	0	0	0	0	0	61	0	0	0	61	0	0	0	0	0	0	0	39	0	0	0	39	100	409
08:15:00	0	0	0	0	0	0	0	61	0	0	0	61	0	0	0	0	0	0	0	41	0	0	0	41	102	421
08:30:00	2	0	0	0	0	2	0	66	0	0	0	66	0	0	0	0	0	0	0	43	1	0	0	44	112	426
08:45:00	0	0	0	0	0	0	0	76	0	0	0	76	0	0	0	0	0	0	0	49	0	0	0	49	125	439
09:00:00	0	0	0	0	0	0	0	58	0	0	0	58	0	0	0	0	0	0	0	42	0	1	0	43	101	440
09:15:00	0	0	0	0	0	0	0	45	0	0	0	45	0	0	0	0	0	0	0	39	0	0	0	39	84	422
09:30:00	0	0	0	0	0	0	0	50	0	0	0	50	0	0	0	0	0	0	0	37	0	0	0	37	87	397
09:45:00	0	0	0	0	0	0	0	45	0	0	0	45	0	0	0	0	0	0	0	44	0	0	0	44	89	361
BREAK																										
16:00:00	1	0	0	0	0	1	0	84	1	0	0	85	0	0	0	0	0	0	0	66	0	0	0	66	152	
16:15:00	0	0	0	0	0	0	0	73	0	0	0	73	0	1	0	0	0	1	0	78	0	0	0	78	152	
16:30:00	0	0	0	0	0	0	0	63	0	0	0	63	0	0	1	0	1	1	0	73	1	0	0	74	138	
16:45:00	0	0	0	0	0	0	0	54	0	0	0	54	0	0	0	0	0	0	0	70	0	0	0	70	124	566
17:00:00	0	0	0	0	0	0	0	52	0	0	0	52	0	0	0	0	0	0	0	55	0	0	0	55	107	521
17:15:00	0	0	0	0	0	0	1	46	0	0	0	47	0	0	0	0	0	0	0	58	0	1	0	59	106	475
17:30:00	0	0	0	0	0	0	0	47	0	0	0	47	0	0	0	0	0	0	0	56	1	0	0	57	104	441
17:45:00	1	0	1	0	0	2	0	42	0	0	0	42	0	0	0	0	0	0	1	42	0	0	0	43	87	404
18:00:00	1	0	0	0	0	1	0	44	0	0	0	44	0	0	0	0	0	0	1	64	0	0	0	65	110	407
18:15:00	0	0	0	0	0	0	0	39	0	0	0	39	0	0	0	0	0	0	0	46	1	0	0	47	86	387
18:30:00	0	0	0	0	0	0	0	28	0	0	0	28	0	0	0	0	0	0	0	24	0	0	0	24	52	335
18:45:00	0	0	0	0	0	0	0	30	0	0	0	30	0	0	0	0	0	0	0	30	0	0	0	30	60	308
Grand Total	7	0	2	0	0	9	1	1277	1	0	0	1279	0	1	2	0	1	3	2	1169	5	2	0	1178	2469	-
Approach%	77.8%	0%	22.2%	0%	-	0.1%	99.8%	0.1%	0%	-	0%	33.3%	66.7%	0%	-	0.2%	99.2%	0.4%	0.2%	-	-	-	-	-	-	-
Totals %	0.3%	0%	0.1%	0%	0.4%	0%	51.7%	0%	0%	51.8%	0%	0%	0.1%	0%	0.1%	0%	47.3%	0.2%	0.1%	47.7%	-	-	-	-	-	-
Heavy	0	0	0	0	-	0	68	0	0	-	0	0	0	0	-	0	73	0	0	-	-	-	-	-	-	-
Heavy %	0%	0%	0%	0%	-	0%	5.3%	0%	0%	-	0%	0%	0%	0%	-	0%	6.2%	0%	0%	-	-	-	-	-	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)

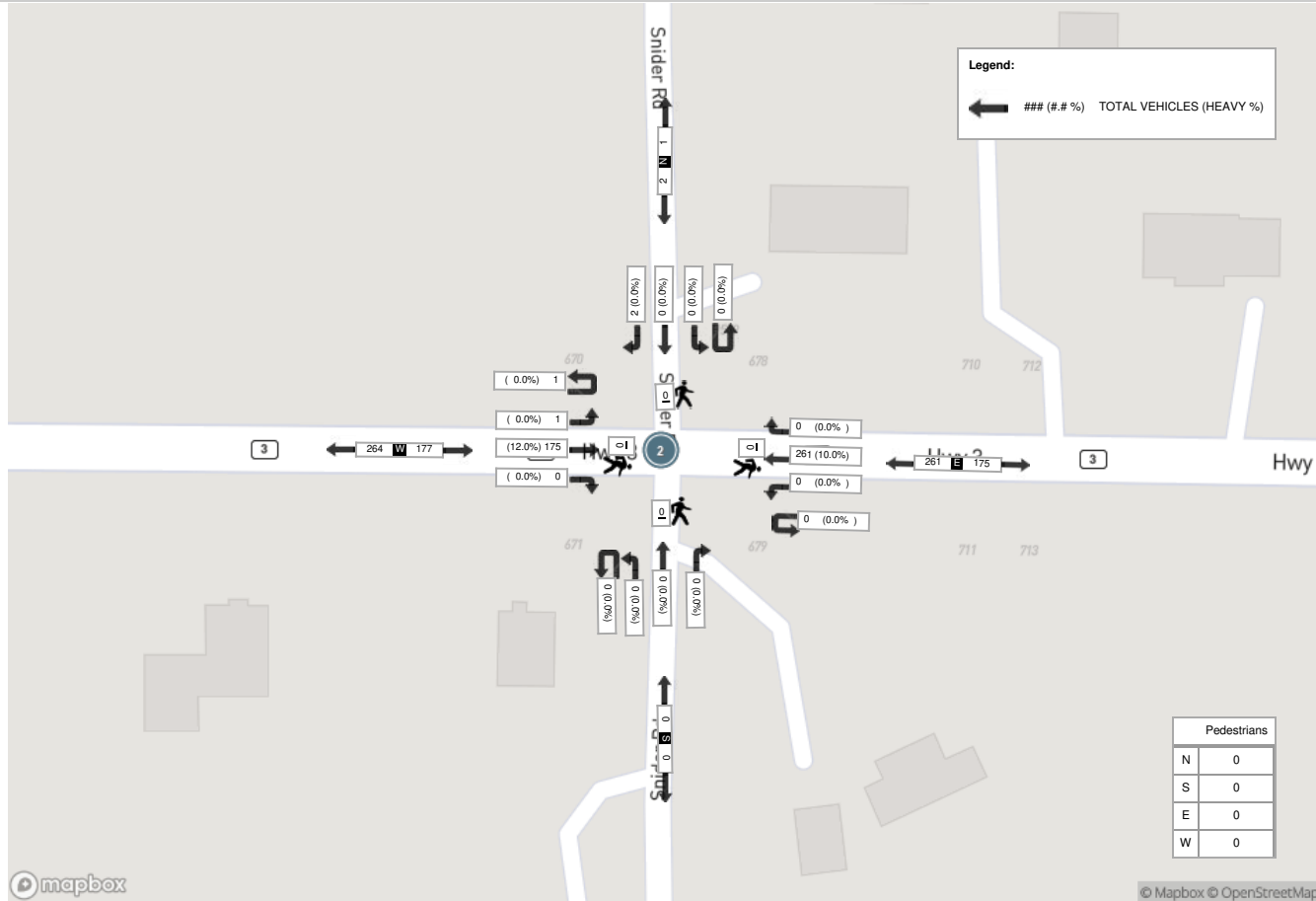
Start Time	N Approach SNIDER RD						E Approach MAIN ST E						S Approach SNIDER RD						W Approach MAIN ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	0	0	0	0	0	0	0	61	0	0	0	61	0	0	0	0	0	0	0	41	0	0	0	41	102
08:30:00	2	0	0	0	0	2	0	66	0	0	0	66	0	0	0	0	0	0	0	43	1	0	0	44	112
08:45:00	0	0	0	0	0	0	0	76	0	0	0	76	0	0	0	0	0	0	0	49	0	0	0	49	125
09:00:00	0	0	0	0	0	0	0	58	0	0	0	58	0	0	0	0	0	0	0	42	0	1	0	43	101
Grand Total	2	0	0	0	0	2	0	261	0	0	0	261	0	0	0	0	0	0	175	1	1	0	177	440	
Approach%	100%	0%	0%	0%	0%	-	0%	100%	0%	0%	-	0%	0%	0%	0%	-	0%	98.9%	0.6%	0.6%	-	-	-	-	
Totals %	0.5%	0%	0%	0%	0%	0.5%	0%	59.3%	0%	0%	59.3%	0%	0%	0%	0%	0%	0%	39.8%	0.2%	0.2%	40.2%	-	-	-	
PHF	0.25	0	0	0	0	0.25	0	0.86	0	0	0.86	0	0	0	0	0	0	0.89	0.25	0.25	0.9	-	-	-	
Heavy	0	0	0	0	0	0	0	26	0	0	26	0	0	0	0	0	0	21	0	0	21	-	-	-	
Heavy %	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	10%	0%	0%	0%	0%	0%	0%	12%	0%	0%	11.9%	-	-	-	
Lights	2	0	0	0	0	2	0	235	0	0	235	0	0	0	0	0	0	154	1	1	156	-	-	-	
Lights %	100%	0%	0%	0%	0%	100%	0%	90%	0%	0%	90%	0%	0%	0%	0%	0%	0%	88%	100%	100%	88.1%	-	-	-	
Single-Unit Trucks	0	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	0	12	0	0	12	-	-	-	
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	5%	0%	0%	0%	0%	0%	0%	6.9%	0%	0%	6.8%	-	-	-	
Buses	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	5	0	0	5	-	-	-	
Buses %	0%	0%	0%	0%	0%	0%	0%	2.3%	0%	0%	2.3%	0%	0%	0%	0%	0%	0%	2.9%	0%	0%	2.8%	-	-	-	
Articulated Trucks	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	-	-	-	
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	2.7%	0%	0%	2.7%	0%	0%	0%	0%	0%	0%	2.3%	0%	0%	2.3%	-	-	-	
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	
Pedestrians%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	



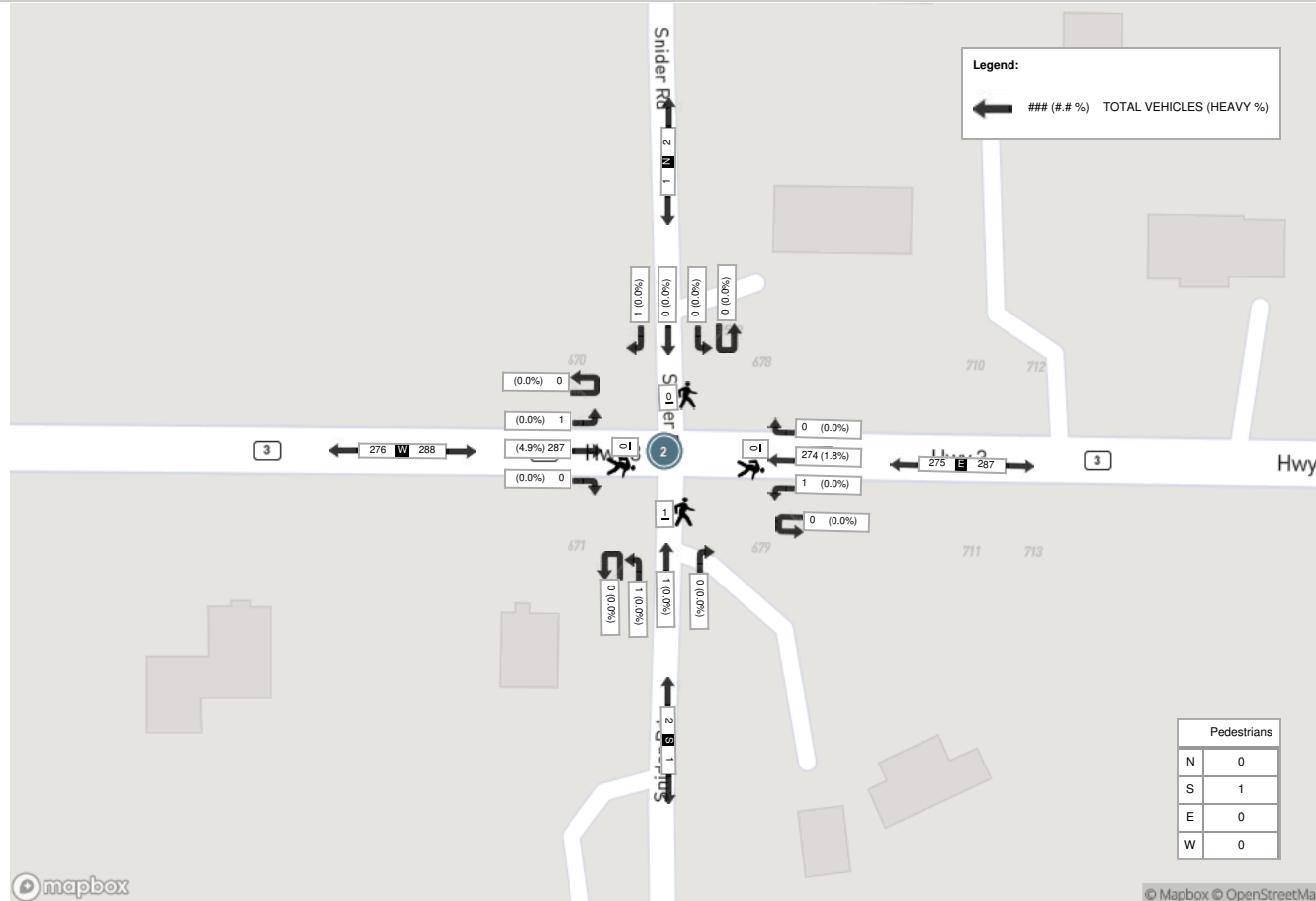
Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)

Start Time	N Approach SNIDER RD						E Approach MAIN ST E						S Approach SNIDER RD						W Approach MAIN ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:00:00	1	0	0	0	0	1	0	84	1	0	0	85	0	0	0	0	0	0	0	66	0	0	0	66	152
16:15:00	0	0	0	0	0	0	0	73	0	0	0	73	0	1	0	0	0	1	0	78	0	0	0	78	152
16:30:00	0	0	0	0	0	0	0	63	0	0	0	63	0	0	1	0	1	1	0	73	1	0	0	74	138
16:45:00	0	0	0	0	0	0	0	54	0	0	0	54	0	0	0	0	0	0	0	70	0	0	0	70	124
Grand Total	1	0	0	0	0	1	0	274	1	0	0	275	0	1	1	0	1	2	0	287	1	0	0	288	566
Approach%	100%	0%	0%	0%		-	0%	99.6%	0.4%	0%		-	0%	50%	50%	0%		-	0%	99.7%	0.3%	0%		-	-
Totals %	0.2%	0%	0%	0%		0.2%	0%	48.4%	0.2%	0%		48.6%	0%	0.2%	0.2%	0%		0.4%	0%	50.7%	0.2%	0%		50.9%	-
PHF	0.25	0	0	0		0.25	0	0.82	0.25	0		0.81	0	0.25	0.25	0		0.5	0	0.92	0.25	0		0.92	-
Heavy	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	14	0	0		14	-
Heavy %	0%	0%	0%	0%		0%	0%	1.8%	0%	0%		1.8%	0%	0%	0%	0%		0%	0%	4.9%	0%	0%		4.9%	-
Lights	1	0	0	0		1	0	269	1	0		270	0	1	1	0		2	0	273	1	0		274	-
Lights %	100%	0%	0%	0%		100%	0%	98.2%	100%	0%		98.2%	0%	100%	100%	0%		100%	0%	95.1%	100%	0%		95.1%	-
Single-Unit Trucks	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	9	0	0		9	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	3.1%	0%	0%		3.1%	-
Buses	0	0	0	0		0	0	3	0	0		3	0	0	0	0		0	0	2	0	0		2	-
Buses %	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		1.1%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	3	0	0		3	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	1%	0%	0%		1%	-
Pedestrians	-	-	-	-	0		-	-	-	-	0		-	-	-	-	1		-	-	-	-	0		-
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	100%		-	-	-	-	0%		-

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)





Turning Movement Count (2 . MAIN ST E & SNIDER RD)

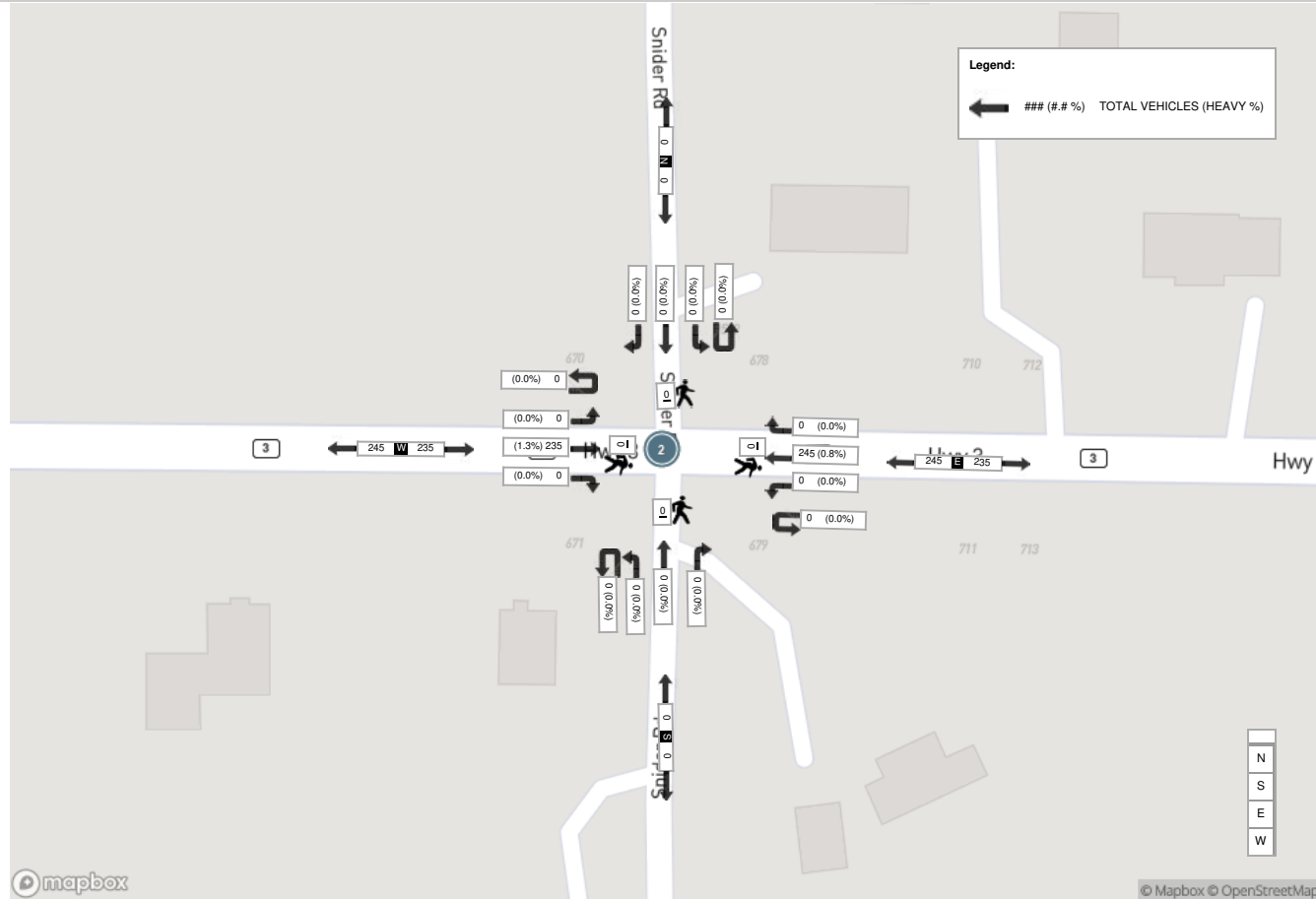
Start Time	N Approach SNIDER RD						E Approach MAIN ST E						S Approach SNIDER RD						W Approach MAIN ST E						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
10:00:00	1	0	0	0	0	1	0	66	0	0	0	66	0	0	0	0	0	0	0	44	0	0	0	44	111	
10:15:00	0	0	0	0	0	0	0	59	0	0	0	59	0	0	0	0	0	0	0	53	0	0	0	53	112	
10:30:00	0	0	0	0	0	0	0	58	0	0	0	58	0	0	0	0	0	0	0	38	1	0	0	39	97	
10:45:00	0	0	0	0	0	0	0	63	0	0	0	63	0	0	0	0	0	0	0	55	0	0	0	55	118	438
11:00:00	0	0	0	0	0	0	0	65	0	0	0	65	0	0	0	0	0	0	0	40	0	0	0	40	105	432
11:15:00	1	0	0	0	0	1	0	65	0	0	0	65	0	0	0	0	0	0	0	61	0	0	0	61	127	447
11:30:00	0	0	0	0	0	0	0	53	0	0	0	53	0	0	0	0	0	0	0	60	1	0	0	61	114	464
11:45:00	0	0	0	0	0	0	0	48	0	0	0	48	0	0	0	0	0	0	0	49	0	0	0	49	97	443
12:00:00	0	0	1	0	0	1	1	55	0	0	0	56	0	0	0	0	0	0	0	51	0	0	0	51	108	446
12:15:00	0	0	0	0	0	0	0	67	0	0	0	67	0	0	0	0	0	0	0	60	0	0	0	60	127	446
12:30:00	0	0	0	0	0	0	0	57	0	0	0	57	0	0	0	0	0	0	0	55	0	0	0	55	112	444
12:45:00	0	0	0	0	0	0	0	58	0	0	0	58	0	0	0	0	0	0	0	63	0	0	0	63	121	468
13:00:00	0	0	0	0	0	0	0	63	0	0	0	63	0	0	0	0	0	0	0	57	0	0	0	57	120	480
13:15:00	0	0	0	0	0	0	0	37	0	0	0	37	0	0	0	0	0	0	0	70	0	0	0	70	107	460
13:30:00	0	0	0	0	0	0	1	47	1	0	0	49	0	0	0	0	0	0	0	60	0	0	0	60	109	457
13:45:00	0	0	0	0	0	0	0	51	0	0	0	51	0	0	2	0	0	2	0	51	0	0	0	51	104	440
Grand Total	2	0	1	0	0	3	2	912	1	0	0	915	0	0	2	0	0	2	0	867	2	0	0	869	1789	-
Approach%	66.7%	0%	33.3%	0%	-	-	0.2%	99.7%	0.1%	0%	-	0%	0%	100%	0%	-	-	0%	99.8%	0.2%	0%	-	-	-	-	-
Totals %	0.1%	0%	0.1%	0%	0.2%	0.1%	51%	0.1%	0%	51.1%	0%	0%	0.1%	0%	0.1%	0%	0.1%	0%	48.5%	0.1%	0%	48.6%	-	-	-	-
Heavy	0	0	0	0	-	0	10	0	0	-	0	0	0	0	0	0	0	0	10	0	0	0	-	-	-	-
Heavy %	0%	0%	0%	0%	-	0%	1.1%	0%	0%	-	0%	0%	0%	0%	-	-	0%	1.2%	0%	0%	-	-	-	-	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 12:15 PM - 01:15 PM Weather: Overcast Clouds (1.02 °C)

Start Time	N Approach SNIDER RD						E Approach MAIN ST E						S Approach SNIDER RD						W Approach MAIN ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
12:15:00	0	0	0	0	0	0	0	67	0	0	0	67	0	0	0	0	0	0	0	60	0	0	0	60	127
12:30:00	0	0	0	0	0	0	0	57	0	0	0	57	0	0	0	0	0	0	0	55	0	0	0	55	112
12:45:00	0	0	0	0	0	0	0	58	0	0	0	58	0	0	0	0	0	0	0	63	0	0	0	63	121
13:00:00	0	0	0	0	0	0	0	63	0	0	0	63	0	0	0	0	0	0	0	57	0	0	0	57	120
Grand Total	0	0	0	0	0	0	0	245	0	0	0	245	0	0	0	0	0	0	0	235	0	0	0	235	480
Approach%	0%	0%	0%	0%		-	0%	100%	0%	0%		-	0%	0%	0%	0%		-	0%	100%	0%	0%		-	-
Totals %	0%	0%	0%	0%		0%	0%	51%	0%	0%		51%	0%	0%	0%	0%		0%	0%	49%	0%	0%		49%	-
PHF	0	0	0	0		0	0	0.91	0	0		0.91	0	0	0	0		0	0	0.93	0	0		0.93	-
Heavy	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	3	0	0		3	-
Heavy %	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.8%	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		1.3%	-
Lights	0	0	0	0		0	0	243	0	0		243	0	0	0	0		0	0	232	0	0		232	-
Lights %	0%	0%	0%	0%		0%	0%	99.2%	0%	0%		99.2%	0%	0%	0%	0%		0%	0%	98.7%	0%	0%		98.7%	-
Single-Unit Trucks	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	2	0	0		2	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.8%	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.9%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	1	0	0		1	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.4%	-

Peak Hour: 12:15 PM - 01:15 PM Weather: Overcast Clouds (1.02 °C)





Turning Movement Count (3 - MAIN ST E & LORRAINE RD / BABION RD)

Start Time	N Approach BABION RD						E Approach MAIN ST E						S Approach LORRAINE RD						W Approach MAIN ST E						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	0	0	0	0	0	0	0	42	0	0	0	42	0	0	0	0	0	0	1	38	0	0	0	39	81	
07:15:00	0	0	0	0	0	0	0	45	0	0	0	45	0	0	2	0	0	2	1	35	0	0	0	36	83	
07:30:00	0	0	0	0	0	0	0	54	0	0	0	54	0	1	1	0	0	2	1	50	1	0	0	52	108	
07:45:00	0	0	0	0	0	0	0	65	0	0	0	65	0	0	0	0	0	0	5	38	0	0	0	43	108	380
08:00:00	0	0	0	1	0	1	0	57	1	0	0	58	1	0	2	0	0	3	3	33	0	0	0	36	98	397
08:15:00	0	0	0	0	0	0	0	58	1	0	0	59	0	0	2	0	0	2	3	40	0	0	0	43	104	418
08:30:00	0	0	0	0	0	0	0	67	0	0	0	67	1	0	1	0	0	2	2	41	0	0	0	43	112	422
08:45:00	1	0	0	0	0	1	0	69	1	0	0	70	0	0	4	0	0	4	0	44	0	0	0	44	119	433
09:00:00	1	2	0	0	0	3	0	50	0	0	0	50	1	0	5	0	0	6	2	43	1	0	0	46	105	440
09:15:00	0	0	0	0	0	0	0	42	0	0	0	42	0	0	1	0	0	1	2	32	0	0	0	34	77	413
09:30:00	0	0	0	0	0	0	0	48	0	0	0	48	0	0	2	0	0	2	2	29	0	0	0	31	81	382
09:45:00	0	0	0	0	0	0	0	45	0	0	0	45	1	0	1	0	0	2	1	51	0	0	0	52	99	362
BREAK																										
16:00:00	0	0	0	0	0	0	0	82	0	0	0	82	1	0	0	0	0	1	4	62	0	0	0	66	149	
16:15:00	0	0	0	0	0	0	0	72	0	0	0	72	0	0	5	0	0	5	5	75	0	0	0	80	157	
16:30:00	1	0	0	0	0	1	0	56	0	0	0	56	1	0	3	0	0	4	3	68	0	0	0	71	132	
16:45:00	1	0	0	0	0	1	0	50	0	0	0	50	1	0	1	0	0	2	4	66	0	0	0	70	123	561
17:00:00	0	0	0	0	0	0	0	50	0	0	0	50	1	0	2	0	0	3	1	56	0	0	0	57	110	522
17:15:00	0	1	0	0	0	1	0	50	0	0	0	50	1	0	0	0	0	1	3	53	0	0	0	56	108	473
17:30:00	0	0	0	0	0	0	0	45	0	0	0	45	0	1	0	0	0	1	0	55	0	0	0	55	101	442
17:45:00	0	0	0	0	0	0	0	44	0	0	0	44	0	2	0	0	0	2	5	38	0	0	0	43	89	408
18:00:00	0	0	0	0	0	0	0	42	0	0	0	42	0	0	1	0	0	1	1	60	0	0	0	61	104	402
18:15:00	0	2	0	0	0	2	0	39	0	0	0	39	0	0	1	0	0	1	2	48	0	0	0	50	92	386
18:30:00	0	0	0	0	0	0	0	25	0	0	0	25	0	0	1	0	0	1	0	24	1	0	0	25	51	336
18:45:00	0	0	0	0	0	0	0	26	0	0	0	26	0	2	4	0	0	6	0	30	0	0	0	30	62	309
Grand Total	4	5	0	1	0	10	0	1223	3	0	0	1226	9	6	39	0	0	54	51	1109	3	0	0	1163	2453	-
Approach%	40%	50%	0%	10%	-	-	0%	99.8%	0.2%	0%	-	16.7%	11.1%	72.2%	0%	-	-	4.4%	95.4%	0.3%	0%	-	-	-	-	-
Totals %	0.2%	0.2%	0%	0%	0.4%	0.4%	0%	49.9%	0.1%	0%	50%	0.4%	0.2%	1.6%	0%	2.2%	2.1%	45.2%	0.1%	0%	47.4%	-	-	-	-	-
Heavy	1	0	0	0	-	-	0	66	1	0	-	1	1	1	0	-	-	3	68	1	0	-	-	-	-	-
Heavy %	25%	0%	0%	0%	-	-	0%	5.4%	33.3%	0%	-	11.1%	16.7%	2.6%	0%	-	-	5.9%	6.1%	33.3%	0%	-	-	-	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)

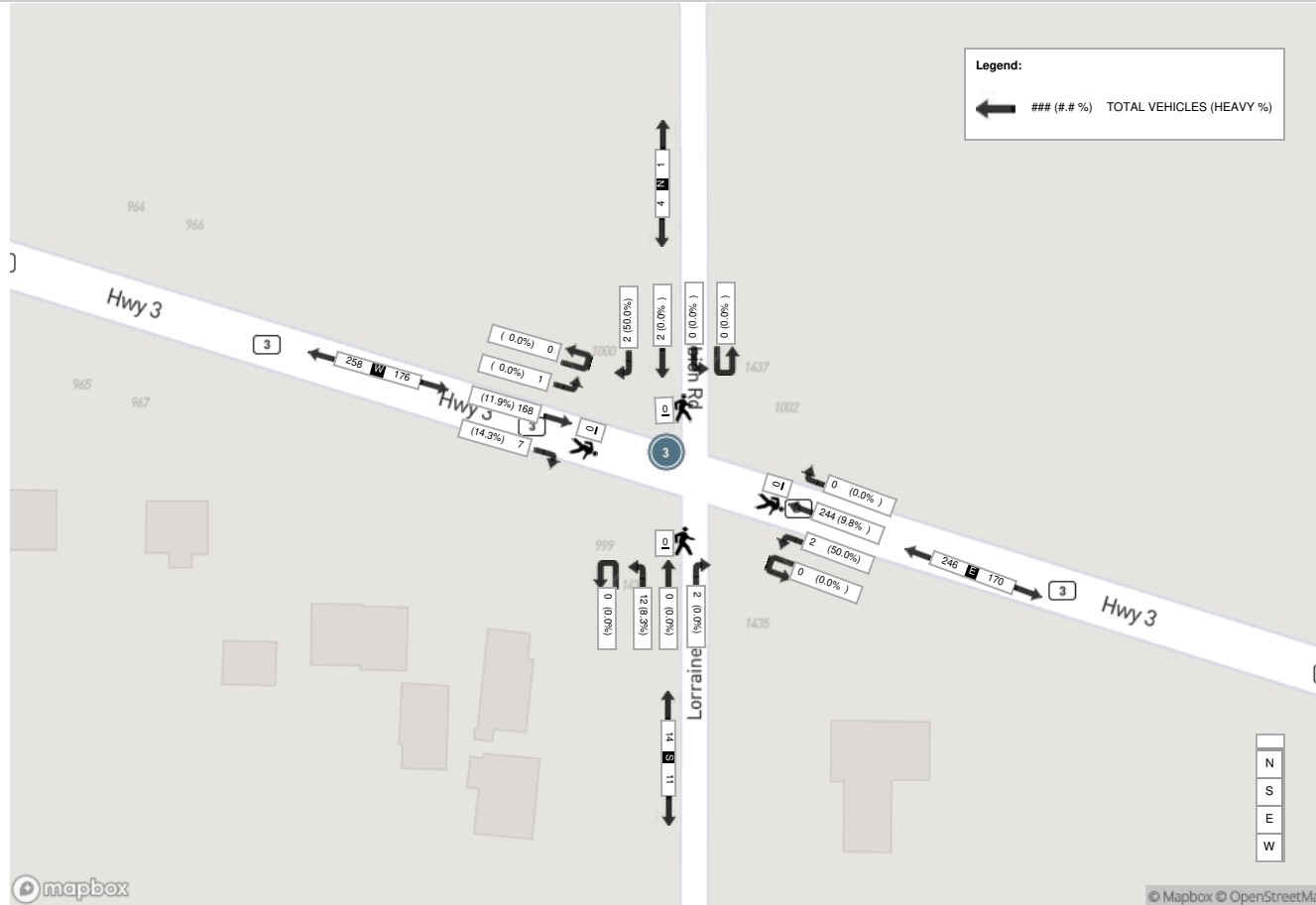
Start Time	N Approach BABION RD						E Approach MAIN ST E						S Approach LORRAINE RD						W Approach MAIN ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	0	0	0	0	0	0	0	58	1	0	0	59	0	0	2	0	0	2	3	40	0	0	0	43	104
08:30:00	0	0	0	0	0	0	0	67	0	0	0	67	1	0	1	0	0	2	2	41	0	0	0	43	112
08:45:00	1	0	0	0	0	1	0	69	1	0	0	70	0	0	4	0	0	4	0	44	0	0	0	44	119
09:00:00	1	2	0	0	0	3	0	50	0	0	0	50	1	0	5	0	0	6	2	43	1	0	0	46	105
Grand Total	2	2	0	0	0	4	0	244	2	0	0	246	2	0	12	0	0	14	7	168	1	0	0	176	440
Approach%	50%	50%	0%	0%	-	-	0%	99.2%	0.8%	0%	-	-	14.3%	0%	85.7%	0%	-	4%	95.5%	0.6%	0%	-	-	-	
Totals %	0.5%	0.5%	0%	0%	0.9%	0%	0%	55.5%	0.5%	0%	55.9%	0%	0.5%	0%	2.7%	0%	3.2%	1.6%	38.2%	0.2%	0%	40%	-	-	
PHF	0.5	0.25	0	0	0.33	0	0	0.88	0.5	0	0.88	0	0.5	0	0.6	0	0.58	0.58	0.95	0.25	0	0.96	-	-	
Heavy	1	0	0	0	1	0	0	24	1	0	25	0	0	1	0	1	1	20	0	0	21	-	-		
Heavy %	50%	0%	0%	0%	25%	0%	0%	9.8%	50%	0%	10.2%	0%	0%	8.3%	0%	7.1%	14.3%	11.9%	0%	0%	11.9%	-	-		
Lights	1	2	0	0	3	0	0	220	1	0	221	2	0	11	0	13	6	148	1	0	155	-	-		
Lights %	50%	100%	0%	0%	75%	0%	0%	90.2%	50%	0%	89.8%	100%	0%	91.7%	0%	92.9%	85.7%	88.1%	100%	0%	88.1%	-	-		
Single-Unit Trucks	0	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	1	11	0	0	12	-	-		
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	5.3%	0%	0%	5.3%	0%	0%	0%	0%	0%	14.3%	6.5%	0%	0%	6.8%	-	-		
Buses	1	0	0	0	1	0	0	4	1	0	5	0	0	1	0	1	0	5	0	0	5	-	-		
Buses %	50%	0%	0%	0%	25%	0%	0%	1.6%	50%	0%	2%	0%	0%	8.3%	0%	7.1%	0%	3%	0%	0%	2.8%	-	-		
Articulated Trucks	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	-	-		
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	2.9%	0%	0%	2.8%	0%	0%	0%	0%	0%	0%	2.4%	0%	0%	2.3%	-	-		



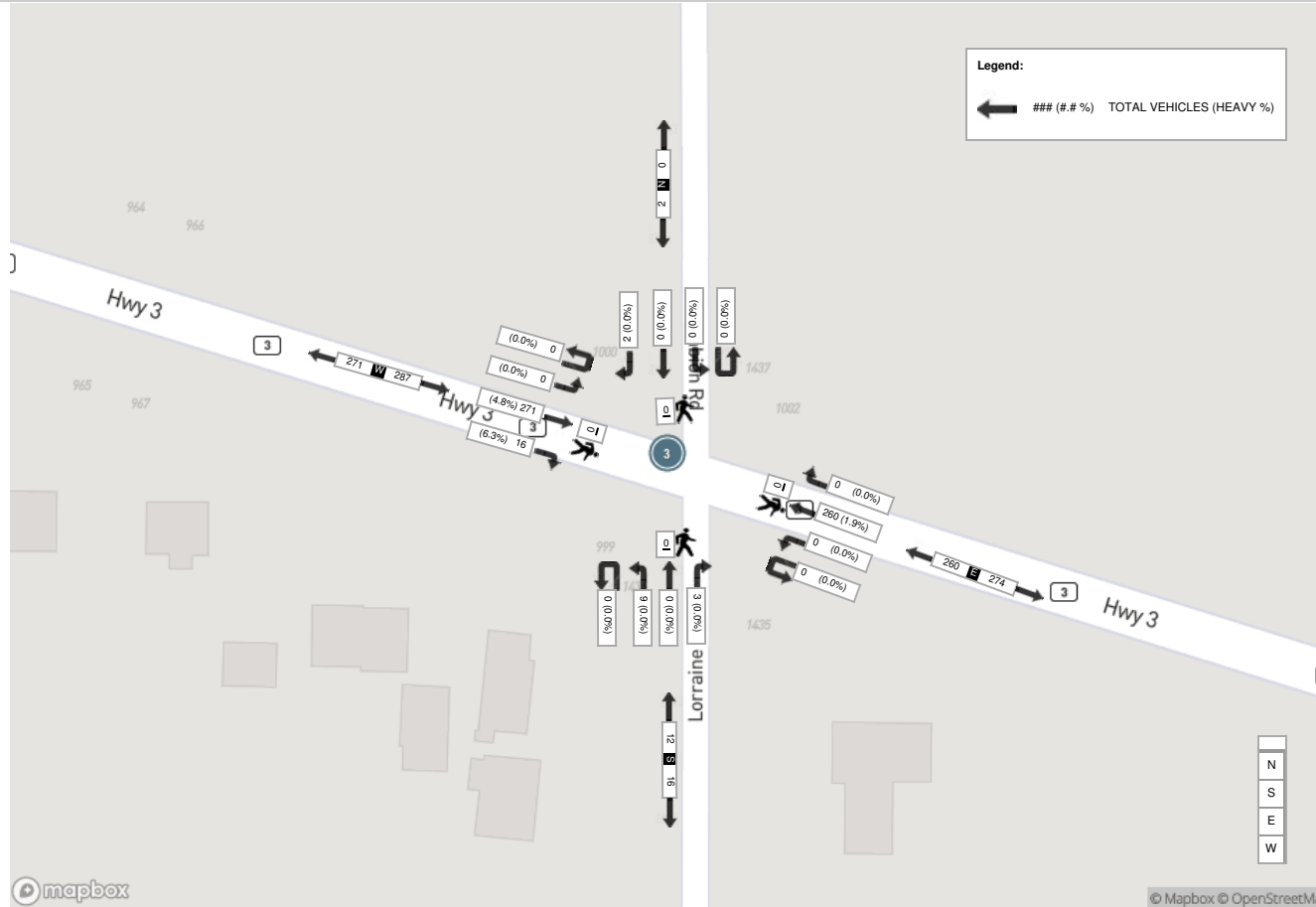
Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)

Start Time	N Approach BABION RD						E Approach MAIN ST E						S Approach LORRAINE RD						W Approach MAIN ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:00:00	0	0	0	0	0	0	0	82	0	0	0	82	1	0	0	0	0	1	4	62	0	0	0	66	149
16:15:00	0	0	0	0	0	0	0	72	0	0	0	72	0	0	5	0	0	5	5	75	0	0	0	80	157
16:30:00	1	0	0	0	0	1	0	56	0	0	0	56	1	0	3	0	0	4	3	68	0	0	0	71	132
16:45:00	1	0	0	0	0	1	0	50	0	0	0	50	1	0	1	0	0	2	4	66	0	0	0	70	123
Grand Total	2	0	0	0	0	2	0	260	0	0	0	260	3	0	9	0	0	12	16	271	0	0	0	287	561
Approach%	100%	0%	0%	0%		-	0%	100%	0%	0%		-	25%	0%	75%	0%		-	5.6%	94.4%	0%	0%		-	-
Totals %	0.4%	0%	0%	0%		0.4%	0%	46.3%	0%	0%		46.3%	0.5%	0%	1.6%	0%		2.1%	2.9%	48.3%	0%	0%		51.2%	-
PHF	0.5	0	0	0		0.5	0	0.79	0	0		0.79	0.75	0	0.45	0		0.6	0.8	0.9	0	0		0.9	-
Heavy	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	1	13	0	0		14	-
Heavy %	0%	0%	0%	0%		0%	0%	1.9%	0%	0%		1.9%	0%	0%	0%	0%		0%	6.3%	4.8%	0%	0%		4.9%	-
Lights	2	0	0	0		2	0	255	0	0		255	3	0	9	0		12	15	258	0	0		273	-
Lights %	100%	0%	0%	0%		100%	0%	98.1%	0%	0%		98.1%	100%	0%	100%	0%		100%	93.8%	95.2%	0%	0%		95.1%	-
Single-Unit Trucks	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	1	8	0	0		9	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.8%	0%	0%	0%	0%		0%	6.3%	3%	0%	0%		3.1%	-
Buses	0	0	0	0		0	0	3	0	0		3	0	0	0	0		0	0	2	0	0		2	-
Buses %	0%	0%	0%	0%		0%	0%	1.2%	0%	0%		1.2%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	3	0	0		3	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		1%	-

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)





Turning Movement Count (3 . MAIN ST E & LORRAINE RD / BABION RD)

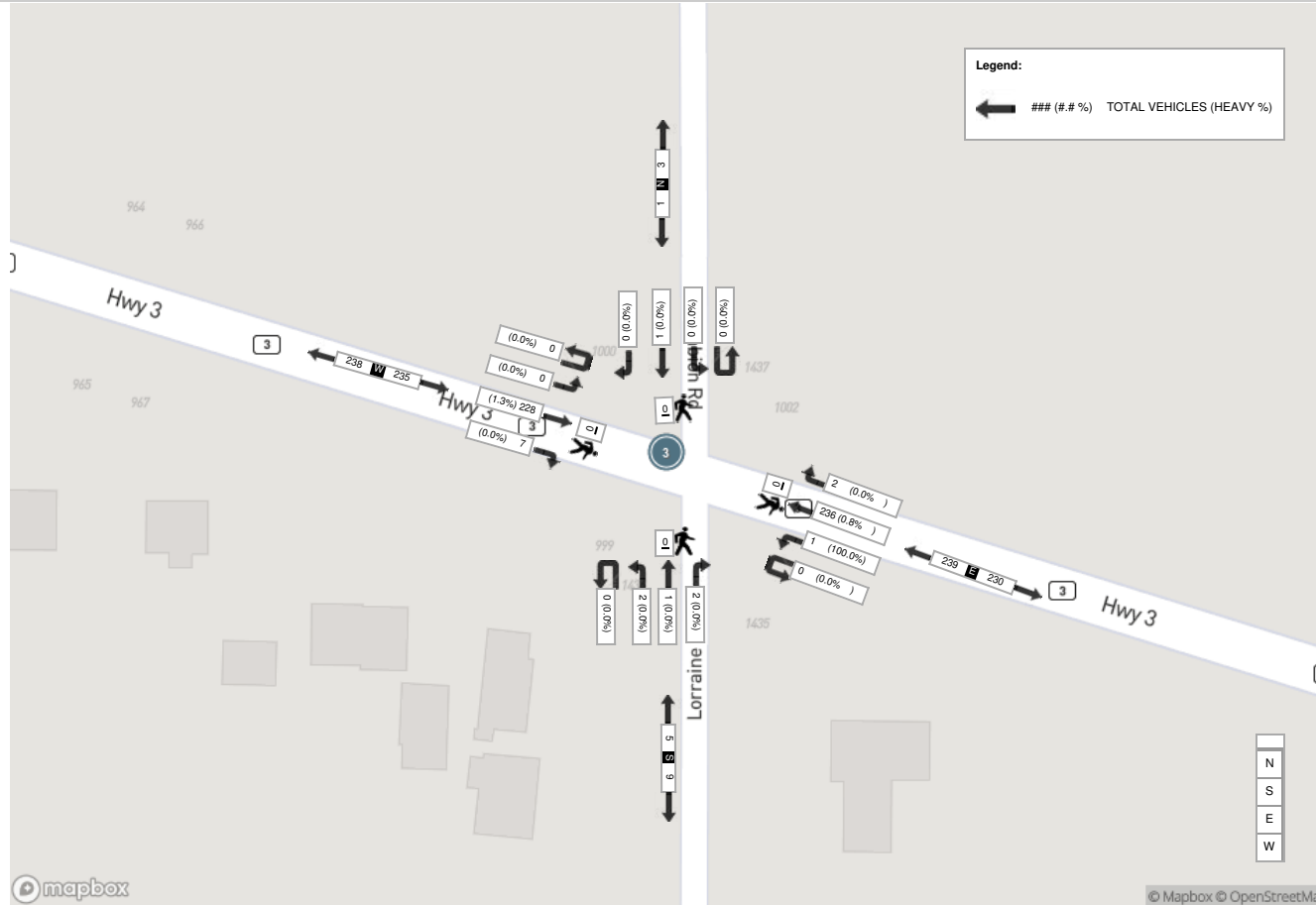
Start Time	N Approach BABION RD						E Approach MAIN ST E						S Approach LORRAINE RD						W Approach MAIN ST E						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
10:00:00	0	0	0	0	0	0	0	62	0	0	0	62	0	0	2	0	0	2	0	44	0	0	0	44	108	
10:15:00	0	0	0	0	0	0	0	56	0	0	0	56	0	0	0	0	0	0	3	50	0	0	0	53	109	
10:30:00	0	2	1	0	0	3	1	58	0	0	0	59	0	1	0	0	0	1	2	36	0	0	0	38	101	
10:45:00	0	0	0	0	0	0	0	63	1	0	0	64	0	0	1	0	0	1	3	52	0	0	0	55	120	438
11:00:00	0	2	0	0	0	2	0	64	0	0	0	64	1	0	3	0	0	4	4	37	0	0	0	41	111	441
11:15:00	0	0	0	0	0	0	0	55	0	0	0	55	0	0	4	0	0	4	0	53	0	0	0	53	112	444
11:30:00	0	0	0	0	0	0	0	53	0	0	0	53	0	0	1	0	0	1	1	60	1	0	0	62	116	459
11:45:00	1	0	0	0	0	1	0	48	0	0	0	48	1	0	0	0	0	1	2	47	1	0	0	50	100	439
12:00:00	0	0	0	0	0	0	0	58	1	0	0	59	0	1	2	0	0	3	2	49	0	0	0	51	113	441
12:15:00	0	0	0	0	0	0	0	62	0	0	0	62	1	0	0	0	0	1	1	59	0	0	0	60	123	452
12:30:00	0	0	0	0	0	0	1	55	1	0	0	57	0	1	0	0	0	1	1	52	0	0	0	53	111	447
12:45:00	0	1	0	0	0	1	0	55	0	0	0	55	0	0	1	0	0	1	5	62	0	0	0	67	124	471
13:00:00	0	0	0	0	0	0	1	64	0	0	0	65	1	0	1	0	0	2	0	55	0	0	0	55	122	480
13:15:00	0	0	0	0	0	0	0	36	0	0	0	36	0	0	0	0	0	0	3	66	0	0	0	69	105	462
13:30:00	0	0	0	0	0	0	0	49	0	0	0	49	0	0	0	0	0	0	5	53	1	0	0	59	108	459
13:45:00	0	0	0	0	0	0	0	45	0	0	0	45	2	0	3	0	0	5	0	49	0	0	0	49	99	434
Grand Total	1	5	1	0	0	7	3	883	3	0	0	889	6	3	18	0	0	27	32	824	3	0	0	859	1782	-
Approach%	14.3%	71.4%	14.3%	0%	-	-	0.3%	99.3%	0.3%	0%	-	-	22.2%	11.1%	66.7%	0%	-	-	3.7%	95.9%	0.3%	0%	-	-	-	-
Totals %	0.1%	0.3%	0.1%	0%	0.4%	0.2%	49.6%	0.2%	0%	49.9%	0.3%	0.2%	1%	0%	1.5%	1.8%	46.2%	0.2%	0%	48.2%	-	-	-	-	-	-
Heavy	0	0	0	0	-	0	10	1	0	-	0	0	0	0	-	0	10	0	0	-	-	-	-	-	-	-
Heavy %	0%	0%	0%	0%	-	0%	1.1%	33.3%	0%	-	0%	0%	0%	0%	-	0%	1.2%	0%	0%	-	-	-	-	-	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 12:15 PM - 01:15 PM Weather: Overcast Clouds (1.02 °C)

Start Time	N Approach BABION RD						E Approach MAIN ST E						S Approach LORRAINE RD						W Approach MAIN ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
12:15:00	0	0	0	0	0	0	0	62	0	0	0	62	1	0	0	0	0	1	1	59	0	0	0	60	123
12:30:00	0	0	0	0	0	0	1	55	1	0	0	57	0	1	0	0	0	1	1	52	0	0	0	53	111
12:45:00	0	1	0	0	0	1	0	55	0	0	0	55	0	0	1	0	0	1	5	62	0	0	0	67	124
13:00:00	0	0	0	0	0	0	1	64	0	0	0	65	1	0	1	0	0	2	0	55	0	0	0	55	122
Grand Total	0	1	0	0	0	1	2	236	1	0	0	239	2	1	2	0	0	5	7	228	0	0	0	235	480
Approach%	0%	100%	0%	0%	-	-	0.8%	98.7%	0.4%	0%	-	-	40%	20%	40%	0%	-	-	3%	97%	0%	0%	-	-	
Totals %	0%	0.2%	0%	0%	0.2%	0.2%	0.4%	49.2%	0.2%	0%	49.8%	0.4%	0.2%	0.4%	0%	1%	1.5%	47.5%	0%	0%	49%	-	-		
PHF	0	0.25	0	0	0.25	0.25	0.5	0.92	0.25	0	0.92	0.5	0.25	0.5	0	0.63	0.35	0.92	0	0	0.88	-	-		
Heavy	0	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	3	0	0	3	-		
Heavy %	0%	0%	0%	0%	0%	0%	0%	0.8%	100%	0%	1.3%	0%	0%	0%	0%	0%	0%	0%	1.3%	0%	0%	1.3%	-		
Lights	0	1	0	0	1	2	234	0	0	0	236	2	1	2	0	5	7	225	0	0	232	-			
Lights %	0%	100%	0%	0%	100%	100%	100%	99.2%	0%	0%	98.7%	100%	100%	100%	0%	100%	100%	98.7%	0%	0%	98.7%	-			
Single-Unit Trucks	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	0	2	-		
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	0.8%	0%	0%	0.8%	0%	0%	0%	0%	0%	0%	0.9%	0%	0%	0.9%	-			
Articulated Trucks	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	1	-		
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0.4%	0%	0%	0%	0%	0%	0%	0.4%	0%	0%	0.4%	-			

Peak Hour: 12:15 PM - 01:15 PM Weather: Overcast Clouds (1.02 °C)





Turning Movement Count (4 . KILLALY ST E & LORRAINE RD (N/S))

Start Time	N Approach LORRAINE RD N						E Approach KILLALY ST E						S Approach LORRAINE RD S						W Approach KILLALY ST E						Int. Total (15 min)	Int. Total (1 hr)	
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total			
07:00:00	0	1	0	0	0	1	0	8	1	0	0	9	0	0	0	0	0	0	2	7	0	0	0	9	19		
07:15:00	0	0	1	0	0	1	2	12	1	0	0	15	0	1	1	0	0	2	2	15	0	0	0	17	35		
07:30:00	0	1	0	0	0	1	0	18	3	0	0	21	1	1	2	0	0	4	0	22	0	0	0	22	48		
07:45:00	0	5	0	0	0	5	0	10	1	0	0	11	2	0	2	0	0	4	4	19	0	0	0	23	43	145	
08:00:00	0	3	1	0	0	4	1	15	2	0	0	18	3	1	1	0	0	5	0	16	1	0	0	17	44	170	
08:15:00	0	3	1	0	0	4	0	24	2	0	0	26	0	1	0	0	0	1	3	16	0	0	0	19	50	185	
08:30:00	0	1	1	0	0	2	1	21	2	0	0	24	3	0	1	0	0	4	0	29	0	0	0	29	59	196	
08:45:00	0	0	0	0	0	0	0	25	2	0	0	27	1	1	3	0	0	5	2	21	1	0	0	24	56	209	
09:00:00	1	0	0	1	0	2	1	16	1	0	0	18	0	3	1	0	0	4	1	25	0	0	0	26	50	215	
09:15:00	1	2	2	0	0	5	2	16	0	0	0	18	3	0	2	0	0	5	1	18	0	0	0	19	47	212	
09:30:00	1	2	0	0	0	3	2	19	0	0	0	21	2	0	0	0	0	2	2	20	0	0	0	22	48	201	
09:45:00	0	0	0	0	0	0	2	16	4	0	0	22	2	0	1	0	0	3	3	14	1	1	0	19	44	189	
BREAK																											
16:00:00	0	4	0	0	0	4	1	24	1	0	0	26	2	0	1	0	0	3	0	34	1	0	0	35	68		
16:15:00	1	2	1	0	0	4	0	33	1	0	0	34	1	1	2	0	0	4	2	34	1	0	0	37	79		
16:30:00	1	2	0	0	0	3	1	28	2	0	0	31	2	2	1	0	0	5	1	41	1	0	0	43	82		
16:45:00	0	2	1	0	0	3	0	18	2	0	0	20	3	1	3	0	0	7	3	32	1	0	0	36	66	295	
17:00:00	1	0	0	0	0	1	1	19	2	0	0	22	0	1	3	0	0	4	2	30	0	0	0	32	59	286	
17:15:00	1	2	1	0	0	4	0	23	1	0	0	24	0	0	4	0	0	4	0	22	1	0	0	23	55	262	
17:30:00	0	0	0	0	0	0	1	26	1	0	0	28	1	0	1	0	0	2	2	18	0	0	0	20	50	230	
17:45:00	0	5	0	0	0	5	0	20	1	0	0	21	2	0	1	0	0	3	3	5	2	0	0	10	39	203	
18:00:00	1	0	0	0	0	1	0	16	2	0	0	18	1	1	3	0	0	5	2	13	0	0	0	15	39	183	
18:15:00	1	0	1	0	0	2	0	15	0	0	0	15	1	1	1	0	0	3	1	17	0	0	0	18	38	166	
18:30:00	0	0	0	0	0	0	1	15	0	0	0	16	1	0	3	0	0	4	2	28	0	0	0	30	50	166	
18:45:00	0	0	0	0	0	0	0	8	1	0	0	9	0	4	0	0	0	4	1	15	0	0	0	16	29	156	
Grand Total	9	35	10	1	0	55	16	445	33	0	0	494	31	19	37	0	0	87	39	511	10	1	0	561	1197	-	
Approach%	16.4%	63.6%	18.2%	1.8%	-	-	3.2%	90.1%	6.7%	0%	-	-	35.6%	21.8%	42.5%	0%	-	-	7%	91.1%	1.8%	0.2%	-	-	-	-	
Totals %	0.8%	2.9%	0.8%	0.1%	-	4.6%	1.3%	37.2%	2.8%	0%	41.3%	2.6%	1.6%	3.1%	0%	-	7.3%	3.3%	42.7%	0.8%	0.1%	-	-	46.9%	-	-	
Heavy	1	3	0	0	-	-	3	35	2	0	-	-	0	1	1	0	-	-	3	22	0	0	-	-	-	-	
Heavy %	11.1%	8.6%	0%	0%	-	-	18.8%	7.9%	6.1%	0%	-	-	0%	5.3%	2.7%	0%	-	-	7.7%	4.3%	0%	0%	-	-	-	-	
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)

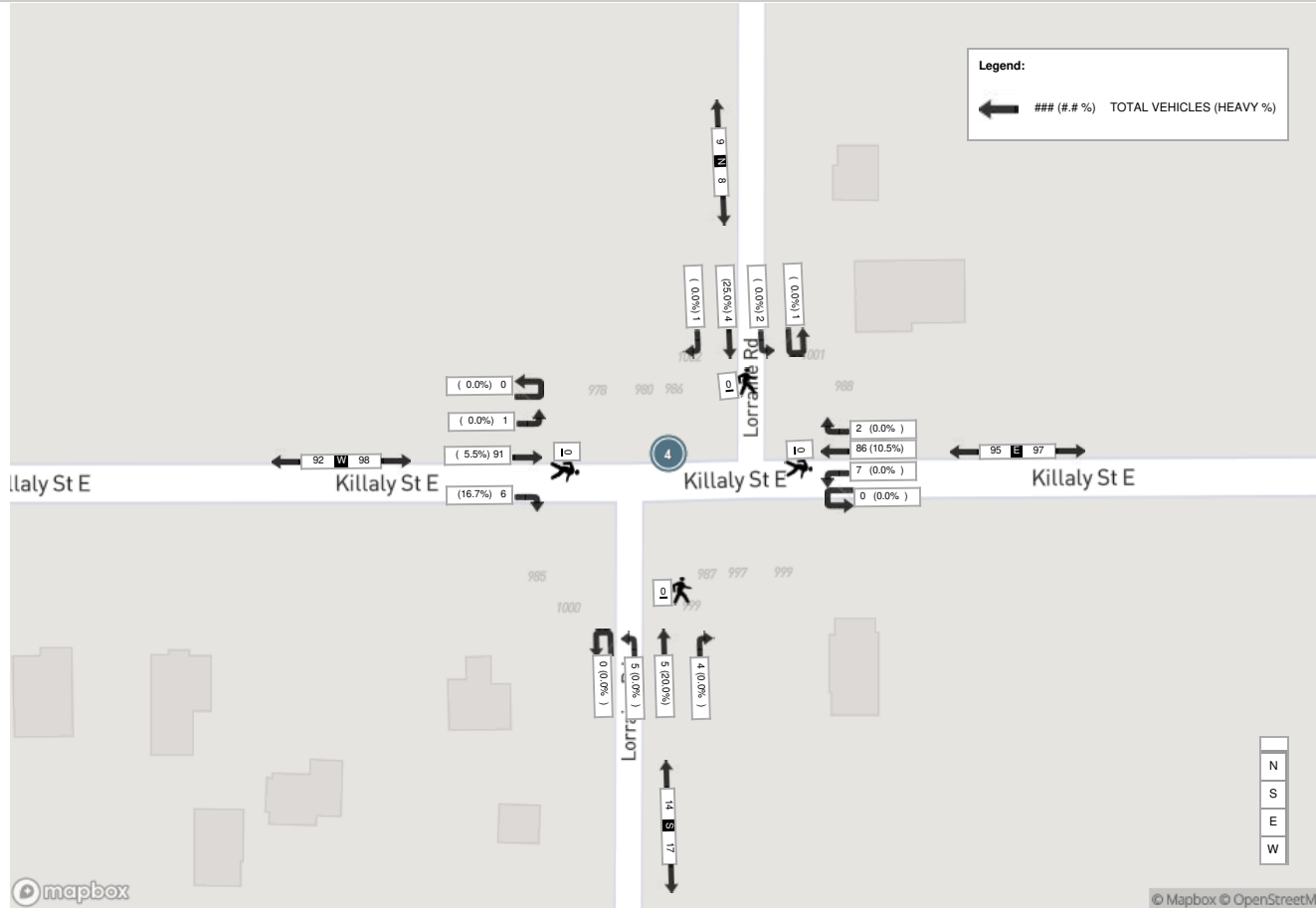
Start Time	N Approach LORRAINE RD N						E Approach KILLALY ST E						S Approach LORRAINE RD S						W Approach KILLALY ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	0	3	1	0	0	4	0	24	2	0	0	26	0	1	0	0	0	1	3	16	0	0	0	19	50
08:30:00	0	1	1	0	0	2	1	21	2	0	0	24	3	0	1	0	0	4	0	29	0	0	0	29	59
08:45:00	0	0	0	0	0	0	0	25	2	0	0	27	1	1	3	0	0	5	2	21	1	0	0	24	56
09:00:00	1	0	0	1	0	2	1	16	1	0	0	18	0	3	1	0	0	4	1	25	0	0	0	26	50
Grand Total	1	4	2	1	0	8	2	86	7	0	0	95	4	5	5	0	0	14	6	91	1	0	0	98	215
Approach%	12.5%	50%	25%	12.5%	-	-	2.1%	90.5%	7.4%	0%	-	-	28.6%	35.7%	35.7%	0%	-	6.1%	92.9%	1%	0%	-	-	-	
Totals %	0.5%	1.9%	0.9%	0.5%	3.7%	3.7%	0.9%	40%	3.3%	0%	44.2%	44.2%	1.9%	2.3%	2.3%	0%	6.5%	2.8%	42.3%	0.5%	0%	45.6%	-	-	
PHF	0.25	0.33	0.5	0.25	0.5	0.5	0.5	0.86	0.88	0	0.88	0.88	0.33	0.42	0.42	0	0.7	0.5	0.78	0.25	0	0.84	-	-	
Heavy	0	1	0	0	1	1	0	9	0	0	9	9	0	1	0	0	1	1	5	0	0	6	-	-	
Heavy %	0%	25%	0%	0%	12.5%	12.5%	0%	10.5%	0%	0%	9.5%	9.5%	0%	20%	0%	0%	7.1%	16.7%	5.5%	0%	0%	6.1%	-	-	
Lights	1	3	2	1	7	7	2	77	7	0	86	86	4	4	5	0	13	5	86	1	0	92	-	-	
Lights %	100%	75%	100%	100%	87.5%	87.5%	100%	89.5%	100%	0%	90.5%	90.5%	100%	80%	100%	0%	92.9%	83.3%	94.5%	100%	0%	93.9%	-	-	
Single-Unit Trucks	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1	0	0	1	-	-	
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	1.2%	0%	0%	1.1%	1.1%	0%	0%	0%	0%	0%	0%	1.1%	0%	0%	1%	-	-	
Buses	0	1	0	0	1	1	0	7	0	0	7	7	0	1	0	0	1	1	3	0	0	4	-	-	
Buses %	0%	25%	0%	0%	12.5%	12.5%	0%	8.1%	0%	0%	7.4%	7.4%	0%	20%	0%	0%	7.1%	16.7%	3.3%	0%	0%	4.1%	-	-	
Articulated Trucks	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1	0	0	1	-	-	
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	1.2%	0%	0%	1.1%	1.1%	0%	0%	0%	0%	0%	0%	1.1%	0%	0%	1%	-	-	



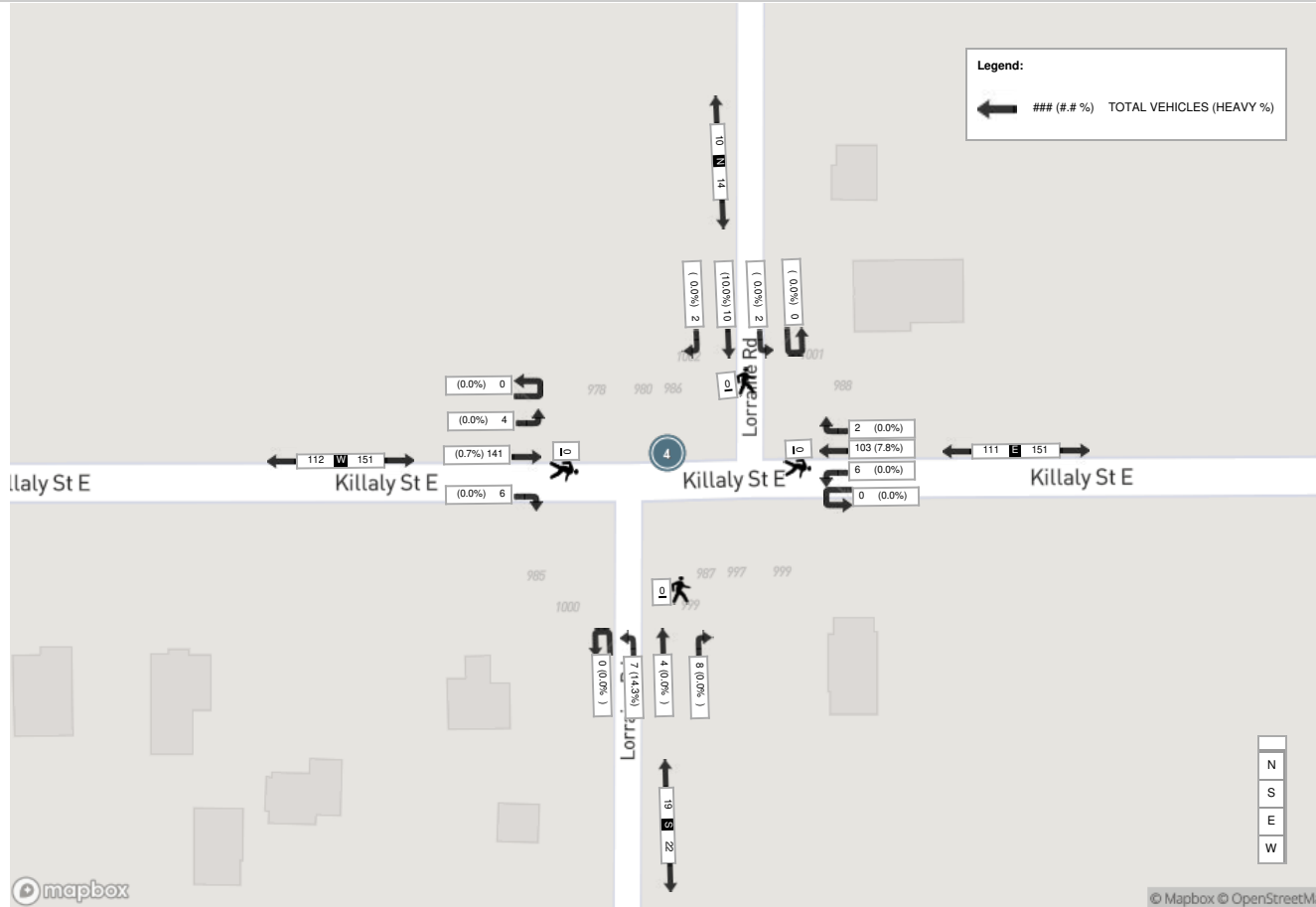
Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)

Start Time	N Approach LORRAINE RD N						E Approach KILLALY ST E						S Approach LORRAINE RD S						W Approach KILLALY ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:00:00	0	4	0	0	0	4	1	24	1	0	0	26	2	0	1	0	0	3	0	34	1	0	0	35	68
16:15:00	1	2	1	0	0	4	0	33	1	0	0	34	1	1	2	0	0	4	2	34	1	0	0	37	79
16:30:00	1	2	0	0	0	3	1	28	2	0	0	31	2	2	1	0	0	5	1	41	1	0	0	43	82
16:45:00	0	2	1	0	0	3	0	18	2	0	0	20	3	1	3	0	0	7	3	32	1	0	0	36	66
Grand Total	2	10	2	0	0	14	2	103	6	0	0	111	8	4	7	0	0	19	6	141	4	0	0	151	295
Approach%	14.3%	71.4%	14.3%	0%		-	1.8%	92.8%	5.4%	0%		-	42.1%	21.1%	36.8%	0%		-	4%	93.4%	2.6%	0%		-	-
Totals %	0.7%	3.4%	0.7%	0%		4.7%	0.7%	34.9%	2%	0%		37.6%	2.7%	1.4%	2.4%	0%		6.4%	2%	47.8%	1.4%	0%		51.2%	-
PHF	0.5	0.63	0.5	0		0.88	0.5	0.78	0.75	0		0.82	0.67	0.5	0.58	0		0.68	0.5	0.86	1	0		0.88	-
Heavy	0	1	0	0		1	0	8	0	0		8	0	0	1	0		1	0	1	0	0		1	-
Heavy %	0%	10%	0%	0%		7.1%	0%	7.8%	0%	0%		7.2%	0%	0%	14.3%	0%		5.3%	0%	0.7%	0%	0%		0.7%	-
Lights	2	9	2	0		13	2	95	6	0		103	8	4	6	0		18	6	140	4	0		150	-
Lights %	100%	90%	100%	0%		92.9%	100%	92.2%	100%	0%		92.8%	100%	100%	85.7%	0%		94.7%	100%	99.3%	100%	0%		99.3%	-
Single-Unit Trucks	0	1	0	0		1	0	3	0	0		3	0	0	1	0		1	0	0	0	0		0	-
Single-Unit Trucks %	0%	10%	0%	0%		7.1%	0%	2.9%	0%	0%		2.7%	0%	0%	14.3%	0%		5.3%	0%	0%	0%	0%		0%	-
Buses	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	1	0	0		1	-
Buses %	0%	0%	0%	0%		0%	0%	4.9%	0%	0%		4.5%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)





Turning Movement Count (4 . KILLALY ST E & LORRAINE RD (N/S))

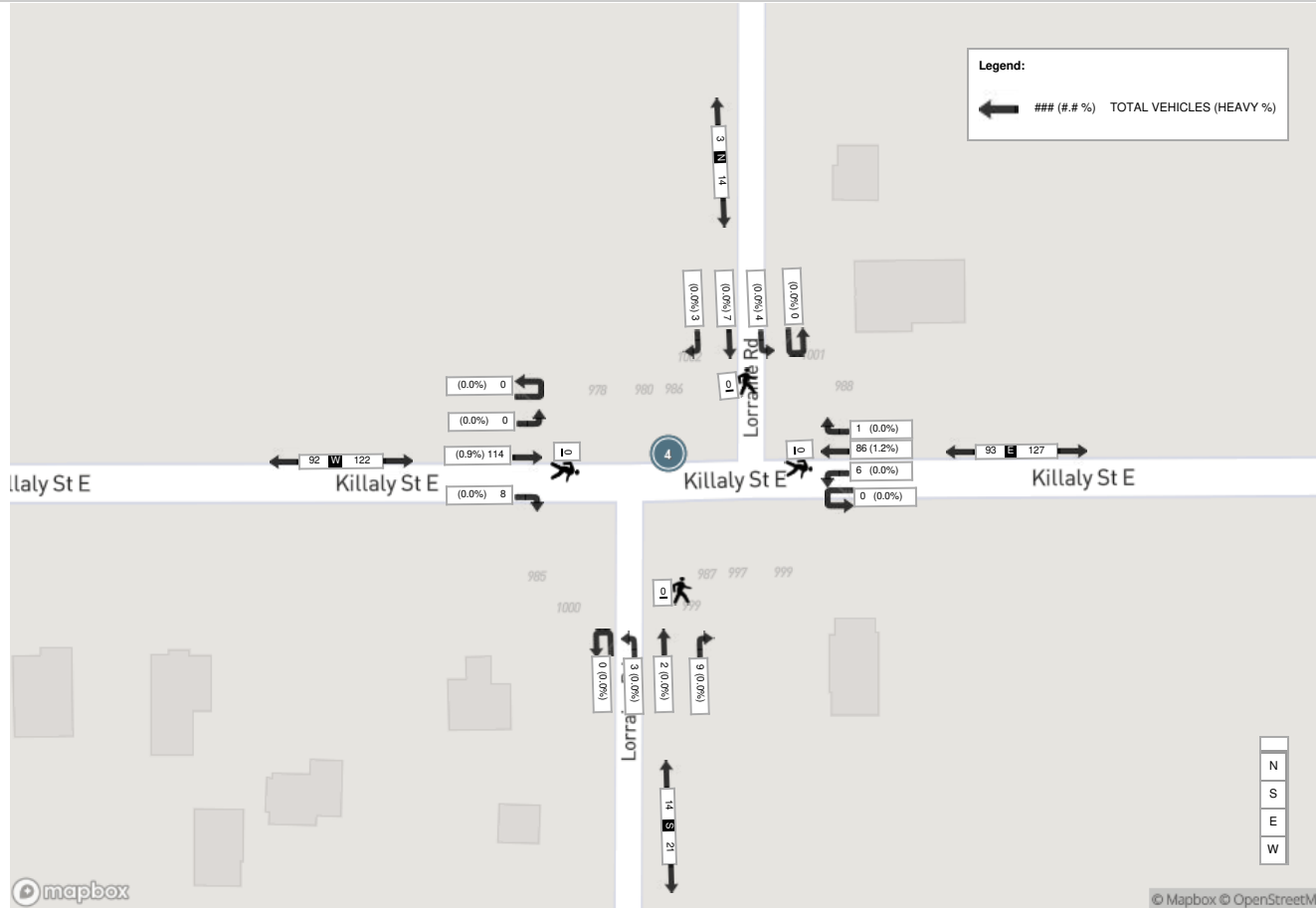
Start Time	N Approach LORRAINE RD N						E Approach KILLALY ST E						S Approach LORRAINE RD S						W Approach KILLALY ST E						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
10:00:00	1	0	0	0	0	1	1	19	1	0	0	21	2	1	2	0	0	5	3	16	0	0	0	19	46	
10:15:00	0	0	3	0	0	3	0	21	4	0	0	25	0	0	1	0	0	1	2	14	1	0	0	17	46	
10:30:00	0	0	3	0	0	3	0	20	0	0	0	20	3	0	0	0	0	3	1	21	1	0	0	23	49	
10:45:00	0	0	2	0	0	2	0	20	0	0	0	20	1	1	0	0	0	2	1	16	0	0	0	17	41	182
11:00:00	0	3	1	0	0	4	1	16	1	0	0	18	1	1	2	0	0	4	3	21	0	0	0	24	50	186
11:15:00	0	0	0	0	0	0	1	29	1	0	0	31	1	2	3	0	0	6	3	23	0	0	0	26	63	203
11:30:00	0	1	0	0	0	1	0	25	1	0	0	26	1	1	2	0	0	4	4	19	0	0	0	23	54	208
11:45:00	1	0	0	0	0	1	0	19	1	0	0	20	2	0	2	0	0	4	2	22	0	0	0	24	49	216
12:00:00	0	2	1	0	0	3	2	15	1	0	0	18	0	1	1	0	0	2	1	25	0	0	0	26	49	215
12:15:00	0	0	1	0	0	1	0	27	2	0	0	29	0	1	1	0	0	2	1	25	0	0	0	26	58	210
12:30:00	1	1	0	0	0	2	0	21	4	0	0	25	1	0	2	0	0	3	1	18	1	0	0	20	50	206
12:45:00	2	2	2	0	0	6	0	23	0	0	0	23	2	1	0	0	0	3	1	27	0	0	0	28	60	217
13:00:00	1	0	0	0	0	1	1	21	5	0	0	27	1	1	0	0	0	2	4	34	0	0	0	38	68	236
13:15:00	0	0	1	0	0	1	0	22	1	0	0	23	1	0	1	0	0	2	0	27	0	0	0	27	53	231
13:30:00	0	5	1	0	0	6	0	20	0	0	0	20	5	0	2	0	0	7	3	26	0	0	0	29	62	243
13:45:00	0	0	0	0	0	0	0	17	1	0	0	18	3	1	4	0	0	8	1	21	1	0	0	23	49	232
Grand Total	6	14	15	0	0	35	6	335	23	0	0	364	24	11	23	0	0	58	31	355	4	0	0	390	847	-
Approach%	17.1%	40%	42.9%	0%		-	1.6%	92%	6.3%	0%		-	41.4%	19%	39.7%	0%		-	7.9%	91%	1%	0%		-	-	-
Totals %	0.7%	1.7%	1.8%	0%		4.1%	0.7%	39.6%	2.7%	0%		43%	2.8%	1.3%	2.7%	0%		6.8%	3.7%	41.9%	0.5%	0%		46%	-	-
Heavy	1	0	0	0		-	0	3	0	0		-	0	0	0	0		-	0	2	0	0		-	-	-
Heavy %	16.7%	0%	0%	0%		-	0%	0.9%	0%	0%		-	0%	0%	0%	0%		-	0%	0.6%	0%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-



Peak Hour: 12:45 PM - 01:45 PM Weather: Overcast Clouds (1.02 °C)

Start Time	N Approach LORRAINE RD N						E Approach KILLALY ST E						S Approach LORRAINE RD S						W Approach KILLALY ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
12:45:00	2	2	2	0	0	6	0	23	0	0	0	23	2	1	0	0	0	3	1	27	0	0	0	28	60
13:00:00	1	0	0	0	0	1	1	21	5	0	0	27	1	1	0	0	0	2	4	34	0	0	0	38	68
13:15:00	0	0	1	0	0	1	0	22	1	0	0	23	1	0	1	0	0	2	0	27	0	0	0	27	53
13:30:00	0	5	1	0	0	6	0	20	0	0	0	20	5	0	2	0	0	7	3	26	0	0	0	29	62
Grand Total	3	7	4	0	0	14	1	86	6	0	0	93	9	2	3	0	0	14	8	114	0	0	0	122	243
Approach%	21.4%	50%	28.6%	0%		-	1.1%	92.5%	6.5%	0%		-	64.3%	14.3%	21.4%	0%		-	6.6%	93.4%	0%	0%		-	-
Totals %	1.2%	2.9%	1.6%	0%		5.8%	0.4%	35.4%	2.5%	0%		38.3%	3.7%	0.8%	1.2%	0%		5.8%	3.3%	46.9%	0%	0%		50.2%	-
PHF	0.38	0.35	0.5	0		0.58	0.25	0.93	0.3	0		0.86	0.45	0.5	0.38	0		0.5	0.5	0.84	0	0		0.8	-
Heavy	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	-
Heavy %	0%	0%	0%	0%		0%	0%	1.2%	0%	0%		1.1%	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.8%	-
Lights	3	7	4	0		14	1	85	6	0		92	9	2	3	0		14	8	113	0	0		121	-
Lights %	100%	100%	100%	0%		100%	100%	98.8%	100%	0%		98.9%	100%	100%	100%	0%		100%	100%	99.1%	0%	0%		99.2%	-
Single-Unit Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	1.2%	0%	0%		1.1%	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.8%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-

Peak Hour: 12:45 PM - 01:45 PM Weather: Overcast Clouds (1.02 °C)





Turning Movement Count (5 . KILLALY ST E & ELIZABETH ST)

Start Time	N Approach ELIZABETH ST						E Approach KILLALY ST E						S Approach ELIZABETH ST						W Approach KILLALY ST E						Int. Total (15 min)	Int. Total (1 hr)
	Right N-W	Thru N-S	Left N-E	UTurn N-N	Peds N:	Approach Total	Right E-N	Thru E-W	Left E-S	UTurn E-E	Peds E:	Approach Total	Right S-E	Thru S-N	Left S-W	UTurn S-S	Peds S:	Approach Total	Right W-S	Thru W-E	Left W-N	UTurn W-W	Peds W:	Approach Total		
07:00:00	15	1	0	0	0	16	4	7	0	0	0	11	0	3	0	0	0	3	0	7	17	0	1	24	54	
07:15:00	15	3	4	0	0	22	7	14	0	0	0	21	3	5	0	0	0	8	0	18	19	0	2	37	88	
07:30:00	23	2	4	0	0	29	1	20	0	0	0	21	2	9	0	0	0	11	0	16	29	0	2	45	106	
07:45:00	17	4	11	0	0	32	8	23	0	0	0	31	1	8	1	0	0	10	2	24	26	0	0	52	125	373
08:00:00	25	3	4	0	0	32	11	18	0	0	0	29	1	4	0	0	0	5	1	22	24	0	0	47	113	432
08:15:00	15	4	5	0	0	24	11	24	0	0	0	35	1	7	1	0	0	9	0	24	25	0	0	49	117	461
08:30:00	12	5	11	0	0	28	9	25	2	0	0	36	4	7	1	0	0	12	1	33	13	0	0	47	123	478
08:45:00	19	7	11	0	0	37	14	35	1	0	0	50	3	7	1	0	1	11	3	26	12	0	0	41	139	492
09:00:00	21	2	7	0	0	30	10	30	0	0	0	40	1	4	0	0	0	5	2	26	25	0	1	53	128	507
09:15:00	21	3	4	0	0	28	9	25	0	0	0	34	1	3	1	0	0	5	1	22	12	0	0	35	102	492
09:30:00	18	2	6	0	0	26	4	21	0	0	0	25	0	8	0	0	0	8	1	23	12	0	0	36	95	464
09:45:00	12	5	7	0	0	24	6	21	3	0	0	30	0	4	0	0	0	4	1	16	15	0	0	32	90	415
BREAK																										
16:00:00	18	6	14	0	0	38	4	25	3	0	0	32	2	2	1	0	0	5	0	38	23	0	1	61	136	
16:15:00	28	7	8	0	0	43	6	37	3	0	0	46	0	4	0	0	1	4	0	37	16	0	1	53	146	
16:30:00	14	8	4	0	0	26	6	29	1	0	0	36	0	4	2	0	0	6	3	41	21	0	0	65	133	
16:45:00	23	4	11	0	0	38	3	19	0	0	0	22	1	10	2	0	0	13	1	37	28	0	1	66	139	554
17:00:00	23	7	6	0	0	36	8	25	0	0	0	33	0	4	0	0	0	4	3	24	21	0	0	48	121	539
17:15:00	15	11	7	0	0	33	6	27	2	0	0	35	0	2	1	0	0	3	2	28	15	0	0	45	116	509
17:30:00	17	4	4	0	0	25	3	27	2	0	0	32	1	5	1	0	0	7	1	26	5	0	0	32	96	472
17:45:00	18	2	14	0	0	34	6	20	0	0	0	26	0	2	1	0	0	3	0	14	9	0	0	23	86	419
18:00:00	15	12	5	0	0	32	7	18	3	0	0	28	2	1	1	0	1	4	3	14	7	0	1	24	88	386
18:15:00	14	8	8	0	0	30	2	22	0	0	0	24	0	6	2	0	0	8	4	21	12	0	1	37	99	369
18:30:00	14	7	4	0	0	25	1	18	0	0	0	19	2	4	0	0	0	6	0	24	12	0	1	36	86	359
18:45:00	6	6	4	0	0	16	2	12	1	0	0	15	0	3	2	0	0	5	2	14	11	0	0	27	63	336
Grand Total	418	123	163	0	0	704	148	542	21	0	0	711	25	116	18	0	3	159	31	575	409	0	12	1015	2589	-
Approach%	59.4%	17.5%	23.2%	0%		-	20.8%	76.2%	3%	0%		-	15.7%	73%	11.3%	0%		-	3.1%	56.7%	40.3%	0%		-	-	-
Totals %	16.1%	4.8%	6.3%	0%		27.2%	5.7%	20.9%	0.8%	0%		27.5%	1%	4.5%	0.7%	0%		6.1%	1.2%	22.2%	15.8%	0%		39.2%	-	-
Heavy	12	4	2	0		-	6	44	1	0		-	0	2	3	0		-	1	28	15	0		-	-	-
Heavy %	2.9%	3.3%	1.2%	0%		-	4.1%	8.1%	4.8%	0%		-	0%	1.7%	16.7%	0%		-	3.2%	4.9%	3.7%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-



Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)

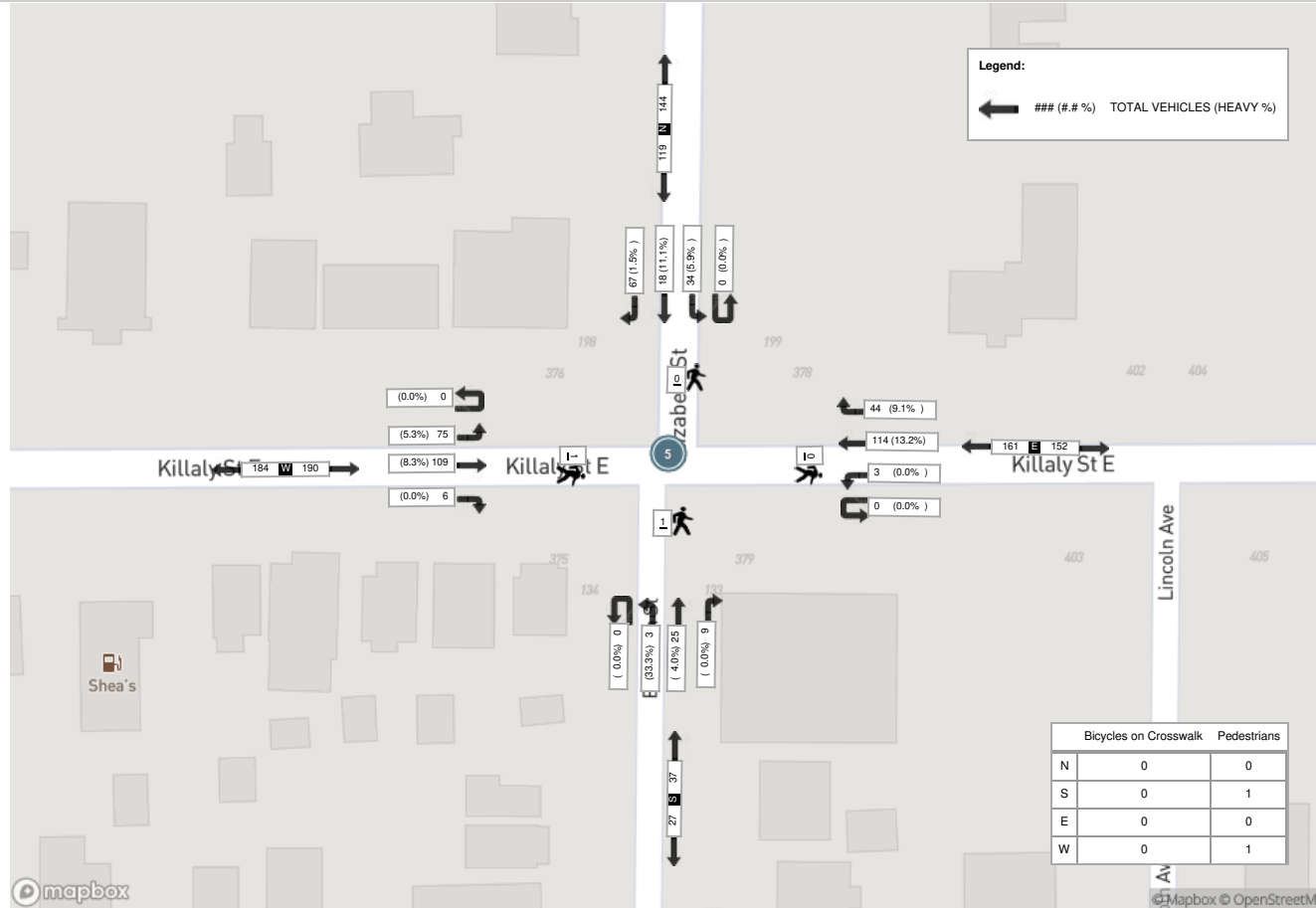
Start Time	N Approach ELIZABETH ST						E Approach KILLALY ST E						S Approach ELIZABETH ST						W Approach KILLALY ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	15	4	5	0	0	24	11	24	0	0	0	35	1	7	1	0	0	9	0	24	25	0	0	49	117
08:30:00	12	5	11	0	0	28	9	25	2	0	0	36	4	7	1	0	0	12	1	33	13	0	0	47	123
08:45:00	19	7	11	0	0	37	14	35	1	0	0	50	3	7	1	0	1	11	3	26	12	0	0	41	139
09:00:00	21	2	7	0	0	30	10	30	0	0	0	40	1	4	0	0	0	5	2	26	25	0	1	53	128
Grand Total	67	18	34	0	0	119	44	114	3	0	0	161	9	25	3	0	1	37	6	109	75	0	1	190	507
Approach%	56.3%	15.1%	28.6%	0%		-	27.3%	70.8%	1.9%	0%		-	24.3%	67.6%	8.1%	0%		-	3.2%	57.4%	39.5%	0%		-	-
Totals %	13.2%	3.6%	6.7%	0%		23.5%	8.7%	22.5%	0.6%	0%		31.8%	1.8%	4.9%	0.6%	0%		7.3%	1.2%	21.5%	14.8%	0%		37.5%	-
PHF	0.8	0.64	0.77	0		0.8	0.79	0.81	0.38	0		0.81	0.56	0.89	0.75	0		0.77	0.5	0.83	0.75	0		0.9	-
Heavy	1	2	2	0		5	4	15	0	0		19	0	1	1	0		2	0	9	4	0		13	-
Heavy %	1.5%	11.1%	5.9%	0%		4.2%	9.1%	13.2%	0%	0%		11.8%	0%	4%	33.3%	0%		5.4%	0%	8.3%	5.3%	0%		6.8%	-
Lights	66	16	32	0		114	40	99	3	0		142	9	24	2	0		35	6	100	71	0		177	-
Lights %	98.5%	88.9%	94.1%	0%		95.8%	90.9%	86.8%	100%	0%		88.2%	100%	96%	66.7%	0%		94.6%	100%	91.7%	94.7%	0%		93.2%	-
Single-Unit Trucks	0	2	0	0		2	1	3	0	0		4	0	1	1	0		2	0	1	0	0		1	-
Single-Unit Trucks %	0%	11.1%	0%	0%		1.7%	2.3%	2.6%	0%	0%		2.5%	0%	4%	33.3%	0%		5.4%	0%	0.9%	0%	0%		0.5%	-
Buses	1	0	2	0		3	3	11	0	0		14	0	0	0	0		0	0	7	2	0		9	-
Buses %	1.5%	0%	5.9%	0%		2.5%	6.8%	9.6%	0%	0%		8.7%	0%	0%	0%	0%		0%	0%	6.4%	2.7%	0%		4.7%	-
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	1	2	0		3	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.6%	0%	0%	0%	0%		0%	0%	0.9%	2.7%	0%		1.6%	-
Pedestrians	-	-	-	-	0		-	-	-	0		-	-	-	-	1		-	-	-	-	1		-	-
Pedestrians%	-	-	-	-	0%		-	-	-	0%		-	-	-	-	50%		-	-	-	-	50%		-	-
Bicycles on Crosswalk	-	-	-	-	0		-	-	-	0		-	-	-	-	0		-	-	-	-	0		-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-



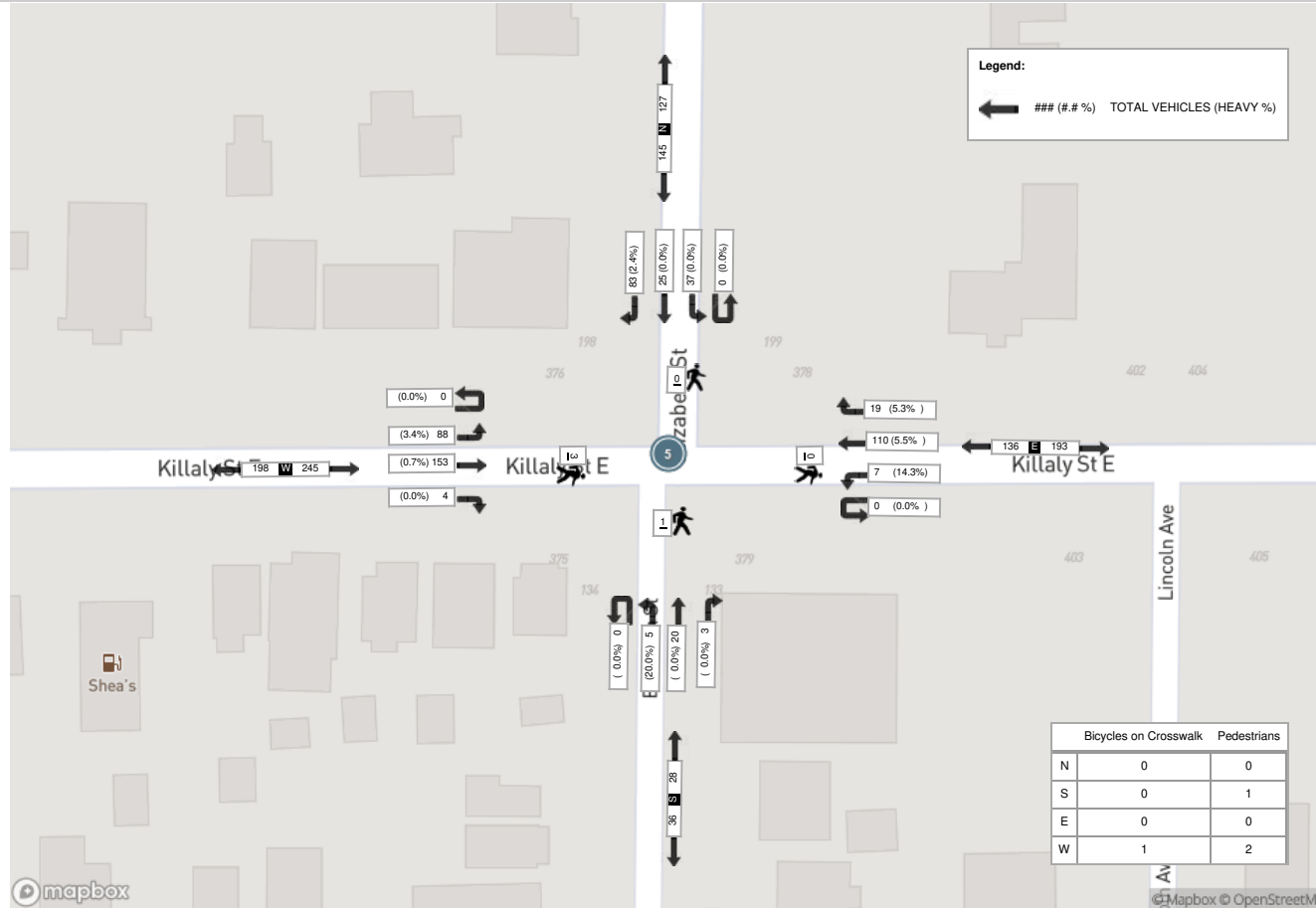
Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)

Start Time	N Approach ELIZABETH ST						E Approach KILLALY ST E						S Approach ELIZABETH ST						W Approach KILLALY ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:00:00	18	6	14	0	0	38	4	25	3	0	0	32	2	2	1	0	0	5	0	38	23	0	1	61	136
16:15:00	28	7	8	0	0	43	6	37	3	0	0	46	0	4	0	0	1	4	0	37	16	0	1	53	146
16:30:00	14	8	4	0	0	26	6	29	1	0	0	36	0	4	2	0	0	6	3	41	21	0	0	65	133
16:45:00	23	4	11	0	0	38	3	19	0	0	0	22	1	10	2	0	0	13	1	37	28	0	1	66	139
Grand Total	83	25	37	0	0	145	19	110	7	0	0	136	3	20	5	0	1	28	4	153	88	0	3	245	554
Approach%	57.2%	17.2%	25.5%	0%		-	14%	80.9%	5.1%	0%		-	10.7%	71.4%	17.9%	0%		-	1.6%	62.4%	35.9%	0%		-	-
Totals %	15%	4.5%	6.7%	0%		26.2%	3.4%	19.9%	1.3%	0%		24.5%	0.5%	3.6%	0.9%	0%		5.1%	0.7%	27.6%	15.9%	0%		44.2%	-
PHF	0.74	0.78	0.66	0		0.84	0.79	0.74	0.58	0		0.74	0.38	0.5	0.63	0		0.54	0.33	0.93	0.79	0		0.93	-
Heavy	2	0	0	0		2	1	6	1	0		8	0	0	1	0		1	0	1	3	0		4	-
Heavy %	2.4%	0%	0%	0%		1.4%	5.3%	5.5%	14.3%	0%		5.9%	0%	0%	20%	0%		3.6%	0%	0.7%	3.4%	0%		1.6%	-
Lights	81	25	37	0		143	18	104	6	0		128	3	20	4	0		27	4	152	85	0		241	-
Lights %	97.6%	100%	100%	0%		98.6%	94.7%	94.5%	85.7%	0%		94.1%	100%	100%	80%	0%		96.4%	100%	99.3%	96.6%	0%		98.4%	-
Single-Unit Trucks	1	0	0	0		1	1	2	1	0		4	0	0	1	0		1	0	0	1	0		1	-
Single-Unit Trucks %	1.2%	0%	0%	0%		0.7%	5.3%	1.8%	14.3%	0%		2.9%	0%	0%	20%	0%		3.6%	0%	0%	1.1%	0%		0.4%	-
Buses	0	0	0	0		0	0	4	0	0		4	0	0	0	0		0	0	1	0	0		1	-
Buses %	0%	0%	0%	0%		0%	0%	3.6%	0%	0%		2.9%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.4%	-
Articulated Trucks	1	0	0	0		1	0	0	0	0		0	0	0	0	0		0	0	0	2	0		2	-
Articulated Trucks %	1.2%	0%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	2.3%	0%			0.8%	-
Pedestrians	-	-	-	-	0	-	-	-	-	0		-	-	-	-	1		-	-	-	-	-	2	-	-
Pedestrians%	-	-	-	-	0%	-	-	-	-	0%		-	-	-	-	25%		-	-	-	-	-	50%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0		-	-	-	-	0		-	-	-	-	-	1	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	-	25%	-	-

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (4.78 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Scattered Clouds (6.31 °C)





Turning Movement Count (5 . KILLALY ST E & ELIZABETH ST)

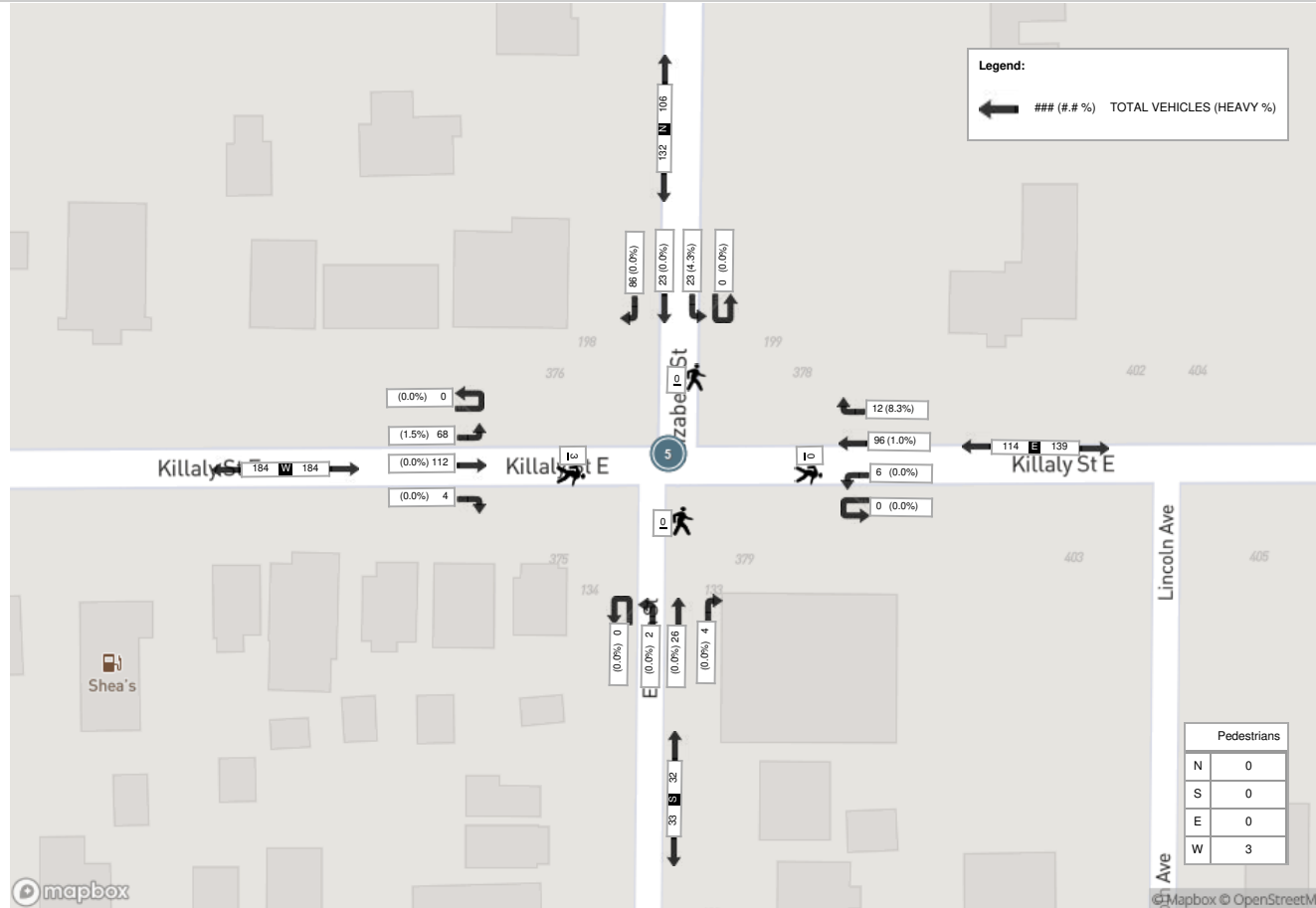
Start Time	N Approach ELIZABETH ST						E Approach KILLALY ST E						S Approach ELIZABETH ST						W Approach KILLALY ST E						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
10:00:00	18	2	2	0	0	22	3	22	0	0	0	25	2	4	4	0	0	10	0	15	17	0	0	32	89	
10:15:00	27	4	4	0	0	35	4	21	0	0	0	25	2	4	1	0	0	7	0	15	23	0	0	38	105	
10:30:00	21	5	8	0	0	34	3	23	2	0	0	28	0	6	3	0	0	9	3	19	28	0	2	50	121	
10:45:00	12	1	3	0	0	16	3	20	2	0	0	25	0	4	0	0	0	4	0	16	17	0	0	33	78	393
11:00:00	18	6	6	0	0	30	7	17	0	0	0	24	0	6	1	0	0	7	1	24	27	0	0	52	113	417
11:15:00	26	6	6	0	0	38	2	31	1	0	0	34	0	4	1	0	0	5	0	27	25	0	1	52	129	441
11:30:00	10	7	5	0	0	22	3	30	0	0	0	33	3	2	1	0	0	6	1	24	20	0	0	45	106	426
11:45:00	16	5	5	0	0	26	9	19	1	0	0	29	1	3	0	0	0	4	0	21	23	0	0	44	103	451
12:00:00	15	3	6	0	0	24	8	16	1	0	0	25	1	2	1	0	0	4	1	23	17	0	0	41	94	432
12:15:00	18	4	1	0	0	23	4	26	2	0	0	32	1	6	0	0	0	7	0	23	22	0	3	45	107	410
12:30:00	31	7	6	0	0	44	2	24	1	0	0	27	2	4	0	0	0	6	0	23	18	0	1	41	118	422
12:45:00	19	7	1	0	0	27	2	26	2	0	0	30	0	8	1	0	0	9	2	29	22	0	0	53	119	438
13:00:00	20	3	10	0	0	33	4	20	2	0	0	26	1	7	0	0	0	8	0	33	14	0	2	47	114	458
13:15:00	16	6	6	0	0	28	4	26	1	0	0	31	1	7	1	0	0	9	2	27	14	0	0	43	111	462
13:30:00	12	4	5	0	0	21	4	27	0	0	0	31	0	8	0	0	0	8	1	26	17	0	1	44	104	448
13:45:00	13	9	1	0	0	23	4	15	0	0	0	19	2	4	1	0	0	7	0	22	17	0	0	39	88	417
Grand Total	292	79	75	0	0	446	66	363	15	0	0	444	16	79	15	0	0	110	11	367	321	0	10	699	1699	-
Approach%	65.5%	17.7%	16.8%	0%	-	-	14.9%	81.8%	3.4%	0%	-	-	14.5%	71.8%	13.6%	0%	-	-	1.6%	52.5%	45.9%	0%	-	-	-	-
Totals %	17.2%	4.6%	4.4%	0%	26.3%	-	3.9%	21.4%	0.9%	0%	26.1%	-	0.9%	4.6%	0.9%	0%	6.5%	-	0.6%	21.6%	18.9%	0%	41.1%	-	-	-
Heavy	3	0	1	0	-	-	1	3	0	0	-	-	0	0	0	0	-	-	0	1	3	0	-	-	-	-
Heavy %	1%	0%	1.3%	0%	-	-	1.5%	0.8%	0%	0%	-	-	0%	0%	0%	0%	-	-	0%	0.3%	0.9%	0%	-	-	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 12:30 PM - 01:30 PM Weather: Overcast Clouds (1.02 °C)

Start Time	N Approach ELIZABETH ST						E Approach KILLALY ST E						S Approach ELIZABETH ST						W Approach KILLALY ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
12:30:00	31	7	6	0	0	44	2	24	1	0	0	27	2	4	0	0	0	6	0	23	18	0	1	41	118
12:45:00	19	7	1	0	0	27	2	26	2	0	0	30	0	8	1	0	0	9	2	29	22	0	0	53	119
13:00:00	20	3	10	0	0	33	4	20	2	0	0	26	1	7	0	0	0	8	0	33	14	0	2	47	114
13:15:00	16	6	6	0	0	28	4	26	1	0	0	31	1	7	1	0	0	9	2	27	14	0	0	43	111
Grand Total	86	23	23	0	0	132	12	96	6	0	0	114	4	26	2	0	0	32	4	112	68	0	3	184	462
Approach%	65.2%	17.4%	17.4%	0%		-	10.5%	84.2%	5.3%	0%		-	12.5%	81.3%	6.3%	0%		-	2.2%	60.9%	37%	0%		-	-
Totals %	18.6%	5%	5%	0%		28.6%	2.6%	20.8%	1.3%	0%		24.7%	0.9%	5.6%	0.4%	0%		6.9%	0.9%	24.2%	14.7%	0%		39.8%	-
PHF	0.69	0.82	0.58	0		0.75	0.75	0.92	0.75	0		0.92	0.5	0.81	0.5	0		0.89	0.5	0.85	0.77	0		0.87	-
Heavy	0	0	1	0		1	1	1	0	0		2	0	0	0	0		0	0	0	1	0		1	-
Heavy %	0%	0%	4.3%	0%		0.8%	8.3%	1%	0%	0%		1.8%	0%	0%	0%	0%		0%	0%	0%	1.5%	0%		0.5%	-
Lights	86	23	22	0		131	11	95	6	0		112	4	26	2	0		32	4	112	67	0		183	-
Lights %	100%	100%	95.7%	0%		99.2%	91.7%	99%	100%	0%		98.2%	100%	100%	100%	0%		100%	100%	100%	98.5%	0%		99.5%	-
Single-Unit Trucks	0	0	1	0		1	1	0	0	0		1	0	0	0	0		0	0	0	1	0		1	-
Single-Unit Trucks %	0%	0%	4.3%	0%		0.8%	8.3%	0%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	0%	1.5%	0%		0.5%	-
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	1%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	3	-	-
Pedestrians%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-	-	100%	-	-

Peak Hour: 12:30 PM - 01:30 PM Weather: Overcast Clouds (1.02 °C)



Signal Code: HW3H14

Intersection: HWY #3 & HWY #140

Municipality: ptcoborne

Owner: MTO

Last Modified: 2021-10-20 1:14:27 PM

Timing Parameters	EBD & WBD HWY #3	NBD & SBD HWY #140	n/a	n/a	n/a	n/a
Min Green	15	10	0	0	0	0
Walk	10	10	0	0	0	0
Ped Clearance	15	15	0	0	0	0
Vehicle Ext.	4.5	3	0	0	0	0
Max Green	35	30	0	0	0	0
Yellow	5.9	5.4	0	0	0	0
All Red	2	2	0	0	0	0

	Offset
Minimum Cycle	40.3 0
Pedestrian Cycle	65.3
Maximum Cycle	80.3 0
Operation	SA

Installed On: 2011-08-18

Count Date: --/--/----

FA = Fully Actuated SA = Semi Actuated FT = Fixed Time

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APPENDIX D

2023 Existing Conditions Detailed Capacity Analysis

Lanes, Volumes, Timings

2023 Existing AM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	129	72	47	180	51	69	113	38	23	75	144
Future Volume (vph)	109	129	72	47	180	51	69	113	38	23	75	144
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.98						
Frt			0.850			0.850		0.962				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1403	1630	1471	1390	1646	1607	0	1554	1716	1240
Flt Permitted	0.634			0.668			0.704			0.653		
Satd. Flow (perm)	997	1535	1403	1146	1471	1368	1220	1607	0	1068	1716	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78			60			24			157
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
Confl. Peds. (#/hr)	4					4						
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 (%)	11%	14%	6%	2%	19%	7%	1%	6%	1%	7%	2%	20%
Adj. Flow (vph)	118	140	78	51	196	55	75	123	41	25	82	157
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	140	78	51	196	55	75	164	0	25	82	157
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0



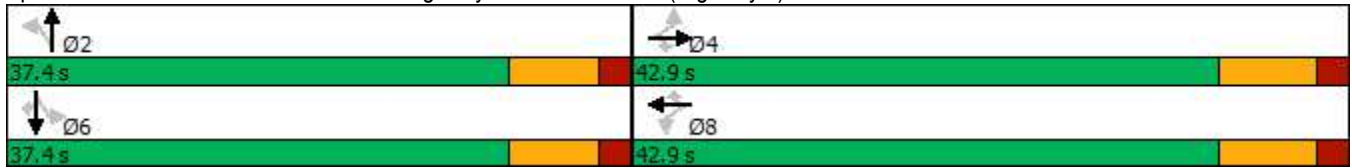
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	16.4	16.4	16.4	16.4	16.4	16.4	30.0	30.0		30.0	30.0	30.0
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.49	0.49		0.49	0.49	0.49
v/c Ratio	0.45	0.34	0.18	0.17	0.50	0.13	0.13	0.21		0.05	0.10	0.23
Control Delay	24.8	20.8	5.9	18.7	24.1	5.8	10.1	9.0		9.6	9.7	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	24.8	20.8	5.9	18.7	24.1	5.8	10.1	9.0		9.6	9.7	3.0
LOS	C	C	A	B	C	A	B	A		A	A	A
Approach Delay		18.8			19.9			9.4			5.7	
Approach LOS		B			B			A			A	
Queue Length 50th (m)	11.7	13.5	0.0	4.7	19.8	0.0	4.3	8.3		1.4	4.7	0.0
Queue Length 95th (m)	25.4	26.7	8.3	12.1	37.0	6.5	12.6	21.2		5.6	12.9	9.0
Internal Link Dist (m)		383.5			817.1			1020.5			134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0			115.0		25.0
Base Capacity (vph)	565	870	829	650	834	801	592	793		519	834	683
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	0.21	0.16	0.09	0.08	0.24	0.07	0.13	0.21		0.05	0.10	0.23

Intersection Summary

Area Type:	Other
Cycle Length:	80.3
Actuated Cycle Length:	61.8
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.50
Intersection Signal Delay:	14.1
Intersection Capacity Utilization:	66.1%
Intersection LOS:	B
ICU Level of Service:	C

Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2023 Existing AM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	118	140	78	51	196	55	75	164	25	82	157
v/c Ratio	0.45	0.34	0.18	0.17	0.50	0.13	0.13	0.21	0.05	0.10	0.23
Control Delay	24.8	20.8	5.9	18.7	24.1	5.8	10.1	9.0	9.6	9.7	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	20.8	5.9	18.7	24.1	5.8	10.1	9.0	9.6	9.7	3.0
Queue Length 50th (m)	11.7	13.5	0.0	4.7	19.8	0.0	4.3	8.3	1.4	4.7	0.0
Queue Length 95th (m)	25.4	26.7	8.3	12.1	37.0	6.5	12.6	21.2	5.6	12.9	9.0
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	565	870	829	650	834	801	592	793	519	834	683
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	0.21	0.16	0.09	0.08	0.24	0.07	0.13	0.21	0.05	0.10	0.23

Intersection Summary

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2023 Existing AM
12/14/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	175	0	0	261	0	0	0	0	0	0	2
Future Volume (vph)	1	175	0	0	261	0	0	0	0	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t												0.865
Fl _t Protected												
Satd. Flow (prot)	0	1447	0	0	1389	0	0	1716	0	0	1484	0
Fl _t Permitted												
Satd. Flow (perm)	0	1447	0	0	1389	0	0	1716	0	0	1484	0
Link Speed (k/h)	70				80				50		50	
Link Distance (m)	841.1				852.0				103.0		194.5	
Travel Time (s)	43.3				38.3				7.4		14.0	
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%	21%	2%	2%	26%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	190	0	0	284	0	0	0	0	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	191	0	0	284	0	0	0	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6				3.6				0.0		0.0	
Link Offset(m)	0.0				0.0				0.0		0.0	
Crosswalk Width(m)	4.8				4.8				4.8		4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15		25		15		25		15	
Sign Control	Free				Free				Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2023 Existing AM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	175	0	0	261	0	0	0	0	0	0	2
Future Volume (Veh/h)	1	175	0	0	261	0	0	0	0	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	190	0	0	284	0	0	0	0	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	284			190			478	476	190	476	476	284
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284			190			478	476	190	476	476	284
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1278			1384			496	487	852	499	487	755
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	191	284	0	2								
Volume Left	1	0	0	0								
Volume Right	0	0	0	2								
cSH	1278	1384	1700	755								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.0	0.0	0.0	0.1								
Control Delay (s)	0.0	0.0	0.0	9.8								
Lane LOS	A		A	A								
Approach Delay (s)	0.0	0.0	0.0	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			24.9%		ICU Level of Service				A			
Analysis Period (min)			15									




















Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2023 Existing AM
 12/14/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	168	7	2	244	0	12	0	2	0	2	2
Future Volume (vph)	1	168	7	2	244	0	12	0	2	0	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.982			0.932	
Flt Protected								0.958				
Satd. Flow (prot)	0	1460	1473	0	1413	1716	0	1628	0	0	1607	0
Flt Permitted								0.958				
Satd. Flow (perm)	0	1460	1473	0	1413	1716	0	1628	0	0	1607	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	20%	1%	1%	24%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	1	183	8	2	265	0	13	0	2	0	2	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	184	8	0	267	0	0	15	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	30.7%						ICU Level of Service A					
Analysis Period (min)	15											

















HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2023 Existing AM
 12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	168	7	2	244	0	12	0	2	0	2	2
Future Volume (Veh/h)	1	168	7	2	244	0	12	0	2	0	2	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	183	8	2	265	0	13	0	2	0	2	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	265			191			457	454	183	456	462	265
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	265			191			457	454	183	456	462	265
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1299			1389			512	501	859	513	496	776
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	184	8	267	0	15	4						
Volume Left	1	0	2	0	13	0						
Volume Right	0	8	0	0	2	2						
cSH	1299	1700	1389	1700	541	605						
Volume to Capacity	0.00	0.00	0.00	0.00	0.03	0.01						
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.7	0.2						
Control Delay (s)	0.0	0.0	0.1	0.0	11.8	11.0						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.0		0.1		11.8	11.0						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			30.7%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2023 Existing AM
12/14/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	91	6	7	86	2	5	5	4	2	4	1
Future Volume (vph)	1	91	6	7	86	2	5	5	4	2	4	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.991			0.997			0.961			0.981	
Fl _t Protected					0.996			0.982			0.986	
Satd. Flow (prot)	0	1656	0	0	1604	0	0	1625	0	0	1669	0
Fl _t Permitted					0.996			0.982			0.986	
Satd. Flow (perm)	0	1656	0	0	1604	0	0	1625	0	0	1669	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	5%	1%	2%	9%	2%	2%	1%	2%	2%	1%	2%
Adj. Flow (vph)	1	99	7	8	93	2	5	5	4	2	4	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	0	0	103	0	0	14	0	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2023 Existing AM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	91	6	7	86	2	5	5	4	2	4	1
Future Volume (Veh/h)	1	91	6	7	86	2	5	5	4	2	4	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	99	7	8	93	2	5	5	4	2	4	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	95			106			218	216	102	221	218	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			106			218	216	102	221	218	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	99	100	100	99	100
cM capacity (veh/h)	1499			1485			731	680	953	724	678	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	107	103	14	7								
Volume Left	1	8	5	2								
Volume Right	7	2	4	1								
cSH	1499	1485	761	722								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (m)	0.0	0.1	0.4	0.2								
Control Delay (s)	0.1	0.6	9.8	10.0								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.1	0.6	9.8	10.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			19.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2023 Existing AM
12/14/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	75	109	6	3	114	44	3	25	9	34	18	67
Future Volume (vph)	75	109	6	3	114	44	3	25	9	34	18	67
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.963			0.966			0.924	
Flt Protected		0.981			0.999			0.996			0.986	
Satd. Flow (prot)	0	1600	0	0	1506	0	0	1663	0	0	1572	0
Flt Permitted		0.981			0.999			0.996			0.986	
Satd. Flow (perm)	0	1600	0	0	1506	0	0	1663	0	0	1572	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		1	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 (%)	4%	9%	2%	2%	15%	4%	1%	1%	2%	2%	2%	1%
Adj. Flow (vph)	82	118	7	3	124	48	3	27	10	37	20	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	0	0	175	0	0	40	0	0	130	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2023 Existing AM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	109	6	3	114	44	3	25	9	34	18	67
Future Volume (Veh/h)	75	109	6	3	114	44	3	25	9	34	18	67
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	82	118	7	3	124	48	3	27	10	37	20	73
Pedestrians					1						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	173			125			522	464	122	465	444	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	173			125			522	464	122	465	444	149
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			99	94	99	92	96	92
cM capacity (veh/h)	1391			1462			395	466	928	457	477	900
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	207	175	40	130								
Volume Left	82	3	3	37								
Volume Right	7	48	10	73								
cSH	1391	1462	524	637								
Volume to Capacity	0.06	0.00	0.08	0.20								
Queue Length 95th (m)	1.5	0.0	2.0	6.1								
Control Delay (s)	3.4	0.1	12.4	12.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.4	0.1	12.4	12.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			45.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings

2023 Existing PM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	211	37	21	229	45	53	124	37	62	94	277
Future Volume (vph)	190	211	37	21	229	45	53	124	37	62	94	277
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.966				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1649	0	1614	1716	1352
Flt Permitted	0.605			0.616			0.691			0.647		
Satd. Flow (perm)	954	1535	1365	1057	1683	1473	1186	1649	0	1099	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			60		21				301
Link Speed (k/h)		70			70			50			60	
Link Distance (m)		407.5			841.1			1044.5			158.6	
Travel Time (s)		21.0			43.3			75.2			9.5	
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	207	229	40	23	249	49	58	135	40	67	102	301
Shared Lane Traffic (%)												
Lane Group Flow (vph)	207	229	40	23	249	49	58	175	0	67	102	301
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

2023 Existing PM
 12/14/2023

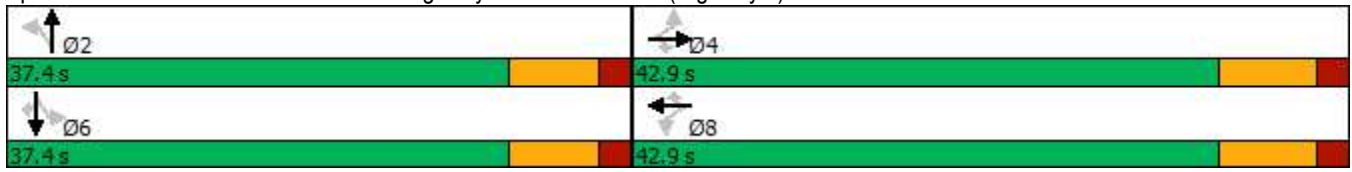


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	21.8	21.8	21.8	21.8	21.8	21.8	30.3	30.3		30.3	30.3	30.3
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.45	0.45		0.45	0.45	0.45
v/c Ratio	0.67	0.46	0.08	0.07	0.46	0.10	0.11	0.23		0.14	0.13	0.39
Control Delay	30.9	20.8	2.8	15.0	20.5	3.8	14.1	12.9		14.5	13.8	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	30.9	20.8	2.8	15.0	20.5	3.8	14.1	12.9		14.5	13.8	3.9
LOS	C	C	A	B	C	A	B	B		B	B	A
Approach Delay		23.7			17.5			13.2				7.5
Approach LOS		C			B			B				A
Queue Length 50th (m)	23.1	23.5	0.0	2.1	25.5	0.0	4.0	11.1		4.7	7.1	0.0
Queue Length 95th (m)	43.9	40.7	3.5	6.4	43.2	4.8	13.9	31.1		15.8	21.0	15.5
Internal Link Dist (m)		383.5			817.1			1020.5				134.6
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0			115.0		25.0
Base Capacity (vph)	499	803	742	553	880	799	532	750		492	769	772
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	0.41	0.29	0.05	0.04	0.28	0.06	0.11	0.23		0.14	0.13	0.39

Intersection Summary

Area Type:	Other
Cycle Length:	80.3
Actuated Cycle Length:	67.6
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	15.7
Intersection LOS:	B
Intersection Capacity Utilization:	68.9%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2023 Existing PM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	207	229	40	23	249	49	58	175	67	102	301
v/c Ratio	0.67	0.46	0.08	0.07	0.46	0.10	0.11	0.23	0.14	0.13	0.39
Control Delay	30.9	20.8	2.8	15.0	20.5	3.8	14.1	12.9	14.5	13.8	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	20.8	2.8	15.0	20.5	3.8	14.1	12.9	14.5	13.8	3.9
Queue Length 50th (m)	23.1	23.5	0.0	2.1	25.5	0.0	4.0	11.1	4.7	7.1	0.0
Queue Length 95th (m)	43.9	40.7	3.5	6.4	43.2	4.8	13.9	31.1	15.8	21.0	15.5
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	499	803	742	553	880	799	532	750	492	769	772
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	0.41	0.29	0.05	0.04	0.28	0.06	0.11	0.23	0.14	0.13	0.39

Intersection Summary

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2023 Existing PM
12/14/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Volume (vph)	1	287	0	1	274	0	1	1	0	0	0	1	
Future Volume (vph)	1	287	0	1	274	0	1	1	0	0	0	1	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt												0.865	
Flt Protected									0.976				
Satd. Flow (prot)	0	1536	0	0	1667	0	0	1675	0	0	1484	0	
Flt Permitted									0.976				
Satd. Flow (perm)	0	1536	0	0	1667	0	0	1675	0	0	1484	0	
Link Speed (k/h)	70				80				50		50		
Link Distance (m)	841.1				852.0				103.0		194.5		
Travel Time (s)	43.3				38.3				7.4		14.0		
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%	
Adj. Flow (vph)	1	312	0	1	298	0	1	1	0	0	0	1	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	313	0	0	299	0	0	2	0	0	1	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	3.6				3.6				0.0		0.0		
Link Offset(m)	0.0				0.0				0.0		0.0		
Crosswalk Width(m)	4.8				4.8				4.8		4.8		
Two way Left Turn Lane													
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	
Turning Speed (k/h)	25		15		25		15		25		15		
Sign Control	Free				Free				Stop		Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2023 Existing PM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	287	0	1	274	0	1	1	0	0	0	1
Future Volume (Veh/h)	1	287	0	1	274	0	1	1	0	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	312	0	1	298	0	1	1	0	0	0	1
Pedestrians												1
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												0
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	299			312			615	615	312	616	615	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	299			312			615	615	312	616	615	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1261			1248			402	406	728	401	406	740
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	313	299	2	1								
Volume Left	1	1	1	0								
Volume Right	0	0	0	1								
cSH	1261	1248	404	740								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.0	0.0	0.1	0.0								
Control Delay (s)	0.0	0.0	14.0	9.9								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.0	0.0	14.0	9.9								
Approach LOS			B	A								
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			27.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2023 Existing PM
 12/14/2023






















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (vph)	0	271	16	0	260	0	9	0	3	0	0	2
Future Volume (vph)	0	271	16	0	260	0	9	0	3	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.969			0.865	
Flt Protected								0.963				
Satd. Flow (prot)	0	1549	1473	0	1667	1716	0	1613	0	0	1499	0
Flt Permitted								0.963				
Satd. Flow (perm)	0	1549	1473	0	1667	1716	0	1613	0	0	1499	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	13%	1%	1%	5%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	0	295	17	0	283	0	10	0	3	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	295	17	0	283	0	0	13	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.5%
ICU Level of Service	A
Analysis Period (min)	15

















HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2023 Existing PM
 12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	271	16	0	260	0	9	0	3	0	0	2
Future Volume (Veh/h)	0	271	16	0	260	0	9	0	3	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	295	17	0	283	0	10	0	3	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	283			312			580	578	295	581	595	283
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	283			312			580	578	295	581	595	283
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1279			1254			426	427	744	423	417	758
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	295	17	283	0	13	2						
Volume Left	0	0	0	0	10	0						
Volume Right	0	17	0	0	3	2						
cSH	1279	1700	1254	1700	473	758						
Volume to Capacity	0.00	0.01	0.00	0.00	0.03	0.00						
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.7	0.1						
Control Delay (s)	0.0	0.0	0.0	0.0	12.8	9.8						
Lane LOS					B	A						
Approach Delay (s)	0.0		0.0		12.8	9.8						
Approach LOS					B	A						
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			31.5%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2023 Existing PM
12/14/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	141	6	6	103	2	7	4	8	2	10	2
Future Volume (vph)	4	141	6	6	103	2	7	4	8	2	10	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.998			0.942			0.982	
Flt Protected		0.999			0.997			0.981			0.993	
Satd. Flow (prot)	0	1720	0	0	1619	0	0	1594	0	0	1685	0
Flt Permitted		0.999			0.997			0.981			0.993	
Satd. Flow (perm)	0	1720	0	0	1619	0	0	1594	0	0	1685	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	1%	1%	2%	8%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	4	153	7	7	112	2	8	4	9	2	11	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	0	121	0	0	21	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.8%
ICU Level of Service	A
Analysis Period (min)	15

















HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2023 Existing PM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	141	6	6	103	2	7	4	8	2	10	2
Future Volume (Veh/h)	4	141	6	6	103	2	7	4	8	2	10	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	4	153	7	7	112	2	8	4	9	2	11	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	114			160			299	292	156	302	295	113
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			160			299	292	156	302	295	113
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	99	100	98	100
cM capacity (veh/h)	1475			1419			641	615	889	636	613	940
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	164	121	21	15								
Volume Left	4	7	8	2								
Volume Right	7	2	9	2								
cSH	1475	1419	722	646								
Volume to Capacity	0.00	0.00	0.03	0.02								
Queue Length 95th (m)	0.1	0.1	0.7	0.6								
Control Delay (s)	0.2	0.5	10.1	10.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	10.1	10.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			19.8%		ICU Level of Service				A			
Analysis Period (min)			15									

















Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2023 Existing PM
12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	153	4	7	110	19	5	20	3	37	25	83
Future Volume (vph)	88	153	4	7	110	19	5	20	3	37	25	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.981			0.986			0.923	
Flt Protected		0.982			0.997			0.992			0.987	
Satd. Flow (prot)	0	1686	0	0	1630	0	0	1693	0	0	1571	0
Flt Permitted		0.982			0.997			0.992			0.987	
Satd. Flow (perm)	0	1686	0	0	1630	0	0	1693	0	0	1571	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)	1					1			3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	96	166	4	8	120	21	5	22	3	40	27	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	266	0	0	149	0	0	30	0	0	157	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	46.6%					ICU Level of Service A						
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 6: Elizabeth Street & Killaly St. E

2023 Existing PM
 12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	153	4	7	110	19	5	20	3	37	25	83
Future Volume (Veh/h)	88	153	4	7	110	19	5	20	3	37	25	83
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	96	166	4	8	120	21	5	22	3	40	27	90
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	142			170			610	518	171	524	510	132
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	142			170			610	518	171	524	510	132
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			98	95	100	90	94	90
cM capacity (veh/h)	1434			1413			331	429	871	421	433	917
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	266	149	30	157								
Volume Left	96	8	5	40								
Volume Right	4	21	3	90								
cSH	1434	1413	430	614								
Volume to Capacity	0.07	0.01	0.07	0.26								
Queue Length 95th (m)	1.7	0.1	1.8	8.1								
Control Delay (s)	3.1	0.5	14.0	12.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.1	0.5	14.0	12.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			46.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings

2023 Existing SAT

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	152	56	40	194	36	116	111	42	19	64	132
Future Volume (vph)	144	152	56	40	194	36	116	111	42	19	64	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1750	1900	1900	1900	1900	1900
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.959				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1626	1845	1482	1805	1827	1599	1630	1779	0	1752	1845	1468
Flt Permitted	0.626			0.653			0.711			0.651		
Satd. Flow (perm)	1072	1845	1482	1241	1827	1599	1220	1779	0	1201	1845	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61			60		27				143
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	3%	9%	0%	4%	1%	2%	3%	1%	3%	3%	10%
Adj. Flow (vph)	157	165	61	43	211	39	126	121	46	21	70	143
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	165	61	43	211	39	126	167	0	21	70	143
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.11	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

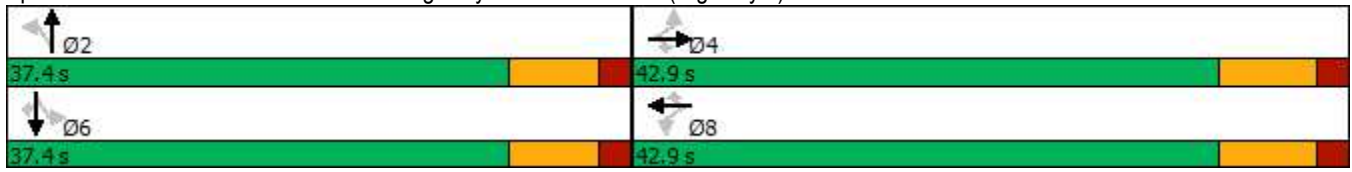


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	17.4	17.4	17.4	17.4	17.4	17.4	30.1	30.1		30.1	30.1	30.1
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.48	0.48		0.48	0.48	0.48
v/c Ratio	0.53	0.32	0.13	0.12	0.42	0.08	0.22	0.19		0.04	0.08	0.18
Control Delay	26.2	19.6	5.8	17.5	21.1	3.2	11.7	9.3		10.3	10.2	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	26.2	19.6	5.8	17.5	21.1	3.2	11.7	9.3		10.3	10.2	3.0
LOS	C	B	A	B	C	A	B	A		B	B	A
Approach Delay		20.1			18.2			10.3				5.8
Approach LOS		C			B			B				A
Queue Length 50th (m)	16.1	15.8	0.0	3.9	20.8	0.0	7.7	8.3		1.2	4.0	0.0
Queue Length 95th (m)	32.4	29.6	7.2	10.4	37.3	3.8	21.1	22.5		5.3	12.1	9.0
Internal Link Dist (m)		383.5			817.1			1020.5				134.6
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0			115.0		25.0
Base Capacity (vph)	598	1030	854	692	1020	919	583	865		574	882	777
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	0.26	0.16	0.07	0.06	0.21	0.04	0.22	0.19		0.04	0.08	0.18

Intersection Summary

Area Type:	Other
Cycle Length:	80.3
Actuated Cycle Length:	62.9
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.53
Intersection Signal Delay:	14.5
Intersection Capacity Utilization:	60.1%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2023 Existing SAT

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	157	165	61	43	211	39	126	167	21	70	143
v/c Ratio	0.53	0.32	0.13	0.12	0.42	0.08	0.22	0.19	0.04	0.08	0.18
Control Delay	26.2	19.6	5.8	17.5	21.1	3.2	11.7	9.3	10.3	10.2	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	19.6	5.8	17.5	21.1	3.2	11.7	9.3	10.3	10.2	3.0
Queue Length 50th (m)	16.1	15.8	0.0	3.9	20.8	0.0	7.7	8.3	1.2	4.0	0.0
Queue Length 95th (m)	32.4	29.6	7.2	10.4	37.3	3.8	21.1	22.5	5.3	12.1	9.0
Internal Link Dist (m)	383.5		817.1				1020.5			134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0	25.0	
Base Capacity (vph)	598	1030	854	692	1020	919	583	865	574	882	777
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	0.26	0.16	0.07	0.06	0.21	0.04	0.22	0.19	0.04	0.08	0.18

Intersection Summary

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2023 Existing SAT
12/14/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	235	0	0	245	0	0	0	0	0	0	0
Future Volume (vph)	0	235	0	0	245	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	1845	0	0	1863	0	0	1863	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	1863	0	0	1863	0	0	1863	0
Link Speed (k/h)		70			80			50			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			7.4			14.0	
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%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	255	0	0	266	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	255	0	0	266	0	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2023 Existing SAT
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	235	0	0	245	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	235	0	0	245	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	255	0	0	266	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	266			255			521	521	255	521	521	266
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			255			521	521	255	521	521	266
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1298			1310			466	460	784	466	460	773
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	255	266	0	0								
Volume Left	0	0	0	0								
Volume Right	0	0	0	0								
cSH	1298	1310	1700	1700								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.0	0.0	0.0	0.0								
Control Delay (s)	0.0	0.0	0.0	0.0								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	0.0	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.0									
Intersection Capacity Utilization			16.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2023 Existing SAT
 12/14/2023





















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	0	228	7	1	236	2	2	1	2	0	1	0
Future Volume (vph)	0	228	7	1	236	2	2	1	2	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.946				
Flt Protected								0.980				
Satd. Flow (prot)	0	1845	1599	0	1863	1583	0	1734	0	0	1863	0
Flt Permitted								0.980				
Satd. Flow (perm)	0	1845	1599	0	1863	1583	0	1734	0	0	1863	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	3%	1%	1%	2%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	0	248	8	1	257	2	2	1	2	0	1	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	8	0	258	2	0	5	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.1%
Analysis Period (min)	15
	ICU Level of Service A

















HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2023 Existing SAT
 12/14/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	228	7	1	236	2	2	1	2	0	1	0	
Future Volume (Veh/h)	0	228	7	1	236	2	2	1	2	0	1	0	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			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	
Hourly flow rate (vph)	0	248	8	1	257	2	2	1	2	0	1	0	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)													
Median type		None					None						
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	259			256			508	509	248	510	515	257	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	259			256			508	509	248	510	515	257	
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)													
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	100			100			100	100	100	100	100	100	
cM capacity (veh/h)	1306			1315			476	467	791	472	463	784	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	248	8	258	2	5	1							
Volume Left	0	0	1	0	2	0							
Volume Right	0	8	0	2	2	0							
cSH	1306	1700	1315	1700	564	463							
Volume to Capacity	0.00	0.00	0.00	0.00	0.01	0.00							
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.2	0.1							
Control Delay (s)	0.0	0.0	0.0	0.0	11.4	12.8							
Lane LOS			A		B	B							
Approach Delay (s)	0.0		0.0		11.4	12.8							
Approach LOS					B	B							
Intersection Summary													
Average Delay			0.2										
Intersection Capacity Utilization			29.1%		ICU Level of Service		A						
Analysis Period (min)			15										

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2023 Existing SAT
12/14/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	114	8	6	86	1	3	2	9	4	7	3
Future Volume (vph)	0	114	8	6	86	1	3	2	9	4	7	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.991			0.999			0.910			0.973	
Fl _t Protected					0.997			0.990			0.987	
Satd. Flow (prot)	0	1864	0	0	1872	0	0	1684	0	0	1798	0
Fl _t Permitted					0.997			0.990			0.987	
Satd. Flow (perm)	0	1864	0	0	1872	0	0	1684	0	0	1798	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	1%	1%	2%	1%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	0	124	9	7	93	1	3	2	10	4	8	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	101	0	0	15	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2023 Existing SAT
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	114	8	6	86	1	3	2	9	4	7	3
Future Volume (Veh/h)	0	114	8	6	86	1	3	2	9	4	7	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	124	9	7	93	1	3	2	10	4	8	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	94			133			243	236	128	247	240	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	94			133			243	236	128	247	240	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	99	99	100
cM capacity (veh/h)	1500			1452			702	663	921	695	659	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	101	15	15								
Volume Left	0	7	3	4								
Volume Right	9	1	10	3								
cSH	1500	1452	827	714								
Volume to Capacity	0.00	0.00	0.02	0.02								
Queue Length 95th (m)	0.0	0.1	0.4	0.5								
Control Delay (s)	0.0	0.6	9.4	10.1								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.6	9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			19.5%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2023 Existing SAT
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	68	112	4	6	96	12	2	25	4	23	23	86
Future Volume (vph)	68	112	4	6	96	12	2	25	4	23	23	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.986			0.984			0.912	
Flt Protected		0.982			0.997			0.997			0.991	
Satd. Flow (prot)	0	1842	0	0	1849	0	0	1843	0	0	1686	0
Flt Permitted		0.982			0.997			0.997			0.991	
Satd. Flow (perm)	0	1842	0	0	1849	0	0	1843	0	0	1686	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)									3	3		
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 (%)	1%	1%	0%	1%	1%	1%	1%	1%	2%	1%	2%	2%
Adj. Flow (vph)	74	122	4	7	104	13	2	27	4	25	25	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	200	0	0	124	0	0	33	0	0	143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

















Intersection Capacity Utilization 37.7%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2023 Existing SAT
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	112	4	6	96	12	2	25	4	23	23	86
Future Volume (Veh/h)	68	112	4	6	96	12	2	25	4	23	23	86
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	74	122	4	7	104	13	2	27	4	25	25	93
Pedestrians					3							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	117			126			502	403	127	417	398	110
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	117			126			502	403	127	417	398	110
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	95	100	95	95	90
cM capacity (veh/h)	1478			1467			400	508	921	501	510	943
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	200	124	33	143								
Volume Left	74	7	2	25								
Volume Right	4	13	4	93								
cSH	1478	1467	528	724								
Volume to Capacity	0.05	0.00	0.06	0.20								
Queue Length 95th (m)	1.3	0.1	1.6	5.9								
Control Delay (s)	3.1	0.5	12.3	11.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.1	0.5	12.3	11.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization			37.7%		ICU Level of Service				A			
Analysis Period (min)			15									

APPENDIX E

Growth Rate Analysis

LHRS	Offset	Year	Hwy No	Hwy Letter	Hwy Type	Location Description	Station #	Region	PDCS #	Pattern	DHV %	Design Hr.	Design Hr.	AAADT	Count Code
32780	0	2010	58	A	KING	HWY 140	210	CENTRAL	5	LR	21	0	N/A	6,750	4
32780	0	2011	58	A	KING	HWY 140	210	CENTRAL	5	LR	19	0	N/A	6,800	1
32780	0	2012	58	A	KING	HWY 140	210	CENTRAL	5	LR	19	0	N/A	9,000	2
32780	0	2013	58	A	KING	HWY 140	210	CENTRAL	2	CTR	10	55	W	8,800	2
32780	0	2014	58	A	KING	HWY 140	210	CENTRAL	2	CTR	10	55	W	7,700	1
32780	0	2015	58	A	KING	HWY 140	210	CENTRAL	2	CTR	10	55	N/A	6,950	4
32780	0	2016	58	A	KING	HWY 140	210	CENTRAL	2	CTR	10	55	N/A	7,750	1
32780	0	2017	58	A	KING	HWY 140	210	CENTRAL	9	CTR	12	55	N/A	7,800	1
32780	0	2018	58	A	KING	HWY 140	210	CENTRAL	9	CTR	12	55	N/A	7,900	1
32780	0	2019	58	A	KING	HWY 140	210	CENTRAL	9	CTR	12	55	N/A	8,000	1
45700	0	2010	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	34	UC	10	51	N/A	7,700	4
45700	0	2011	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	34	UC	9	51	N/A	7,500	2
45700	0	2012	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	74	UC	9	51	N/A	8,000	4
45700	0	2013	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	74	UC	9	52	S	8,600	4
45700	0	2014	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	74	UC	9	52	S	8,000	1
45700	0	2015	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	74	UC	9	57	S	8,500	4
45700	0	2016	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	74	UC	9	57	S	7,800	2
45700	0	2017	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	74	UC	9	57	N/A	9,400	1
45700	0	2018	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	74	UC	9	57	N/A	9,650	1
45700	0	2019	140		KING	HWY 3 MAIN ST E PORT COLBORNE	5	CENTRAL	74	UC	9	57	N/A	9,900	1

Compounded Growth Rate		
1	Highway 140	1.7%
2	Main Street East (Highway 3)	2.5%

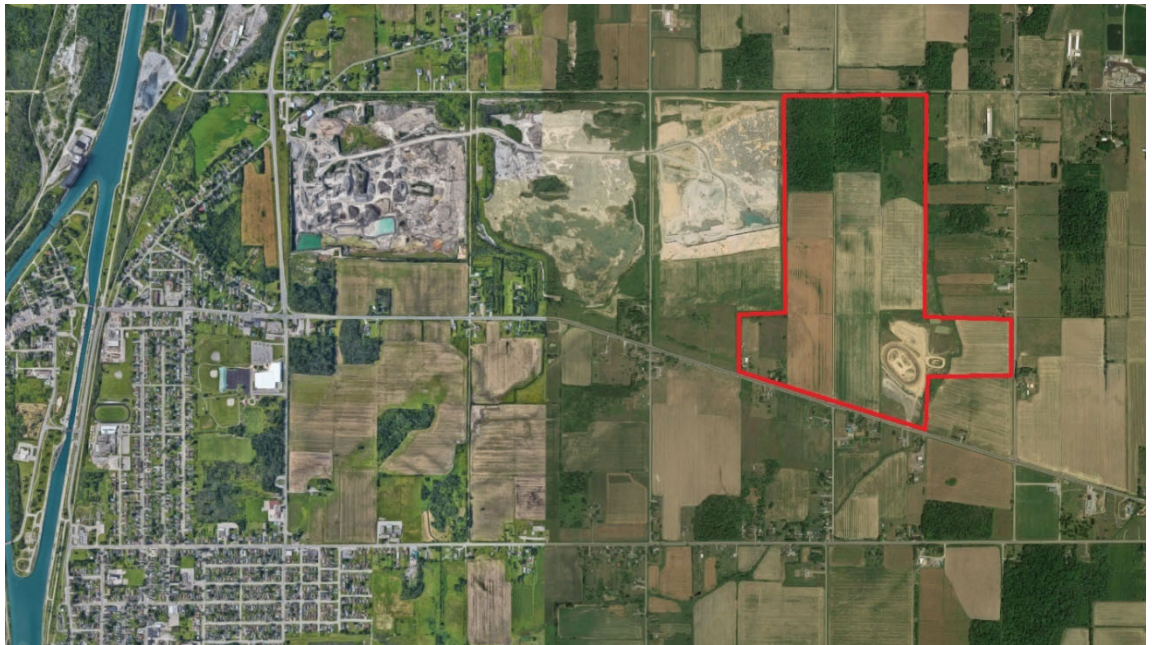
APPENDIX F

Background Development Trips



Traffic Impact Study

Port Colborne Quarries Pit 3 Expansion



Prepared for Port Colborne Quarries Inc.
by IBI Group
October 19, 2020

Document Control Page

CLIENT:	Port Colborne Quarries Inc.
PROJECT NAME:	Port Colborne Quarries Pit 3 Expansion
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HISTORY:	1.0 – Draft Report – Issued for Client Review – July 12, 2019 2.0 – Draft Report – Issued for Client Review – May 5, 2020 3.0 – Final Report – Issued for Approval – October 19, 2020

6.4 Trip Generation

Based on information provided by Port Colborne Quarries Inc. (PCQI) staff, an annual extraction rate of 1,000,000 tonnes per year is considered a reasonable annual extraction rate for the planned Pit 3 expansion operations, based on past performance. Given that there is no intention to increase extraction capacity, an annual extraction rate of 1,000,000 tonnes per year will be used to estimate the number of truck trips generated by subject site Pit 3 expansion operations through to the 2041 horizon.

PCQI staff indicate that truck volumes are steady throughout the day with no peaking. With approximately 250 workdays per year, 10 work hours per work day, and an average load of 26 tonnes per truck, it is expected that the subject site Pit 3 expansion operations will generate an average of 15.4 truck trips per hour.

For the purposes of the Synchro traffic capacity analysis, the truck volumes have been converted into equivalent passenger car volumes. Based on the Transportation Research Board's Highway Capacity Manual 2010 (HCM), a heavy vehicle is equivalent to two passenger cars and therefore the passenger car equivalent (PCE) trips generated by the subject site (i.e. automobile and truck traffic combined) are provided.

The traffic counts recorded in February 2019 found that during the weekday morning peak hour, the subject site generated nine truck and six automobile trips. During the afternoon peak hour, six truck and 23 automobile trips were observed. This is well below the volume of truck-only trips calculated based on received PCQI operations information. This may be due to the traffic count being conducted during the winter, when trucking volumes may be lower than during the summer.

This trip estimate is compared to observed existing traffic activity at the subject site below in **Exhibit 6-5**. The trips determined to be most appropriate for usage in this TIS traffic analysis is also provided.

Exhibit 6-5 - Trip Generation Results

SUBJECT SITE LAND USE	TRIP CALCULATION METHOD	AM PEAK HOUR TRIPS (PCE)			PM PEAK HOUR TRIPS (PCE)		
		IN	OUT	TOTAL	IN	OUT	TOTAL
PCQI quarry operations	PCQI extraction rate, work scheduling, truck capacity	31	31	62	0	0	0
	February 2019 traffic data observations	16	8	24	6	29	35
	Trips applied for TIS analysis	47	39	86	6	29	35

Notes:
 PCE = Passenger Car Equivalent

PCQI staff have indicated that trucking activities begin around 6:00 am and the last truck leaves the site around 4:00 pm. As such, no significant volume of trucking activity is expected to occur at the site during the afternoon peak hour. Afternoon peak hour traffic will consist of employees completing their shift.

It is not anticipated that there will be an increase in the number of employees as a result of the Pit 3 expansion and employee parking is expected to remain in its current location. Existing employee trips to/from the site have already been captured in the traffic counts and no new employee trips are expected.

To be conservative, for Pit 3 expansion trucking operations, the calculated subject site truck traffic volumes are utilized in this TIS report's future total traffic analysis. The existing site traffic activity was not subtracted from the future total traffic analysis and kept as-is due to the minimal volumes observed.

6.5 Trip Distribution and Assignment

PCQI staff have indicated that during the early phases of the Pit 3 Expansion, until the Highway 3 access is constructed, all truck traffic will enter and exit the site from the existing Ramey Road access and head north or south via Highway 140.

Once the Highway 3 access is constructed but while Pit 1 is not fully backfilled, truck traffic will enter the site via the Ramey Road access to dump a load of clean fill in Pit 1, then traverse the site internally to the Pit 3 Expansion to pick up a load of new material, then exit via the Highway 3 access.

Once Pit 1 is fully backfilled, it is expected that all truck traffic will enter and exit via the Highway 3 access.

The truck trip distribution was determined based on discussions with PCQI staff.

Given the timing for the opening of the Highway 3 access and the projected time required to backfill Pit 1, a separate trip distribution has been assumed for each analysis year:

2031:

- 100% inbound and outbound trips via Ramey Road access:
 - 50% to/from the North via Highway 140
 - 50% to/from the West via Highway 3

2036:

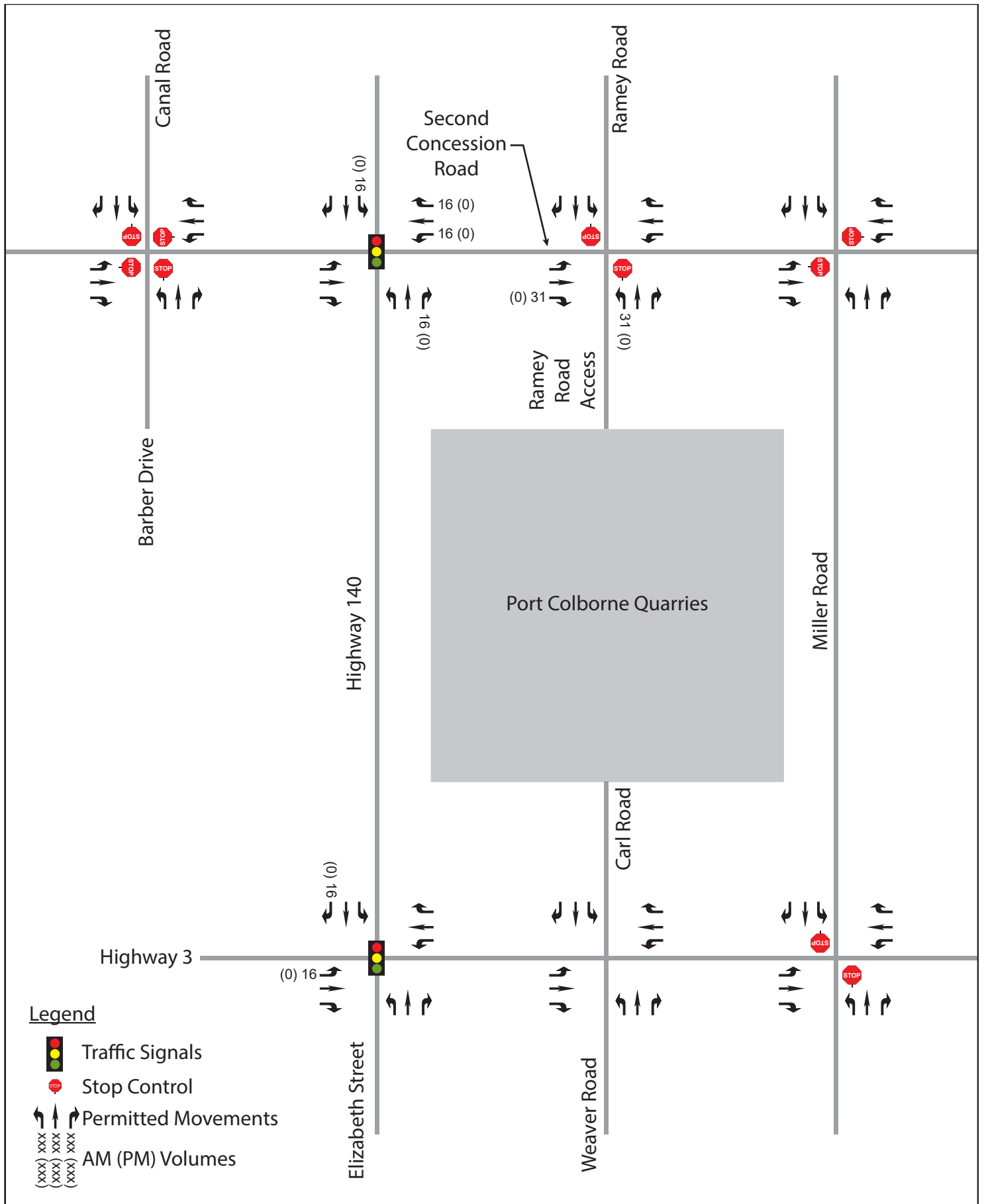
- 100% inbound trips via Ramey Road access and 100% of outbound trips via Highway 3 access:
 - 45% to/from the North via Highway 140
 - 45% to/from the West via Highway 3
 - 10% to/from the East via Highway 3

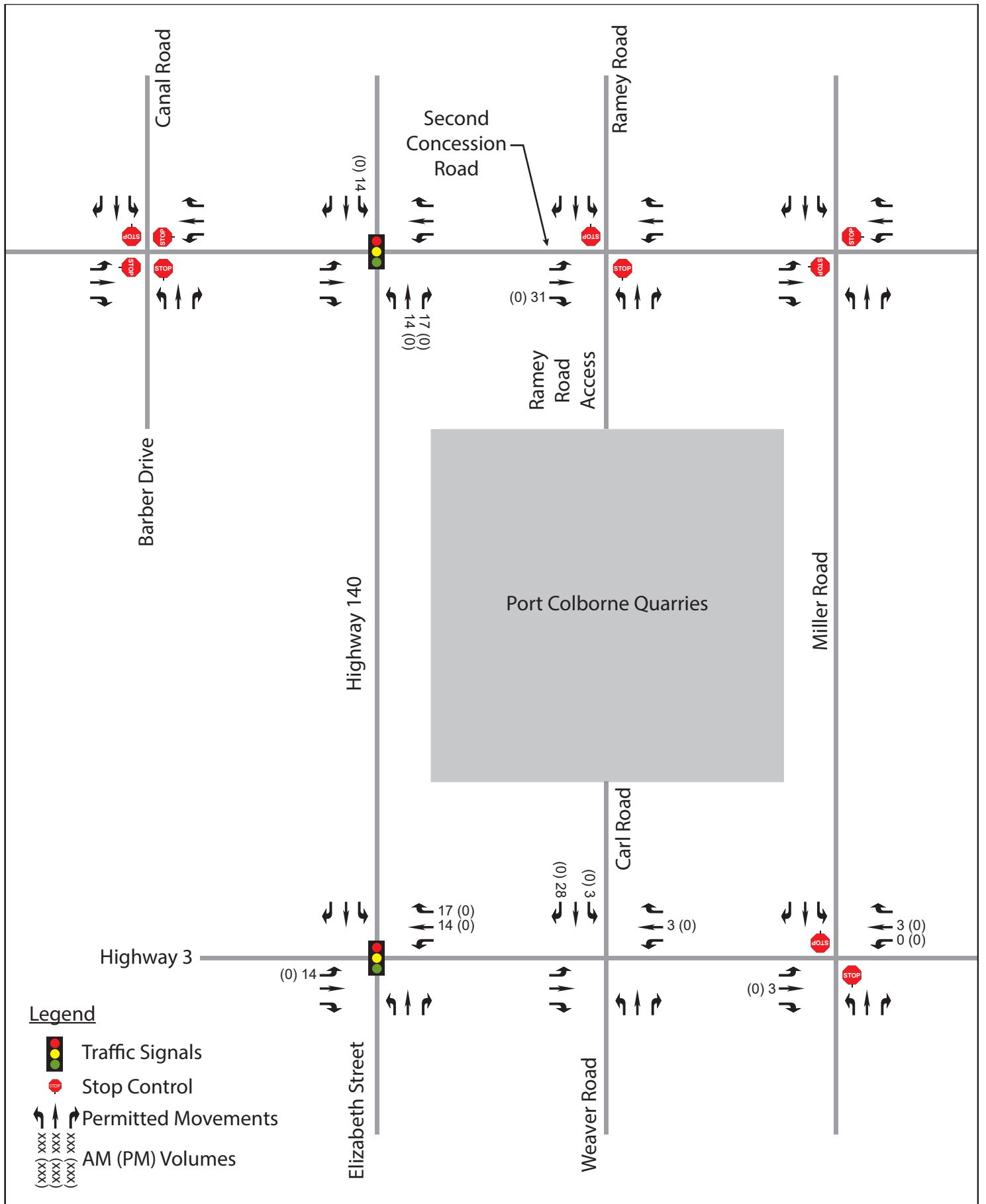
2041:

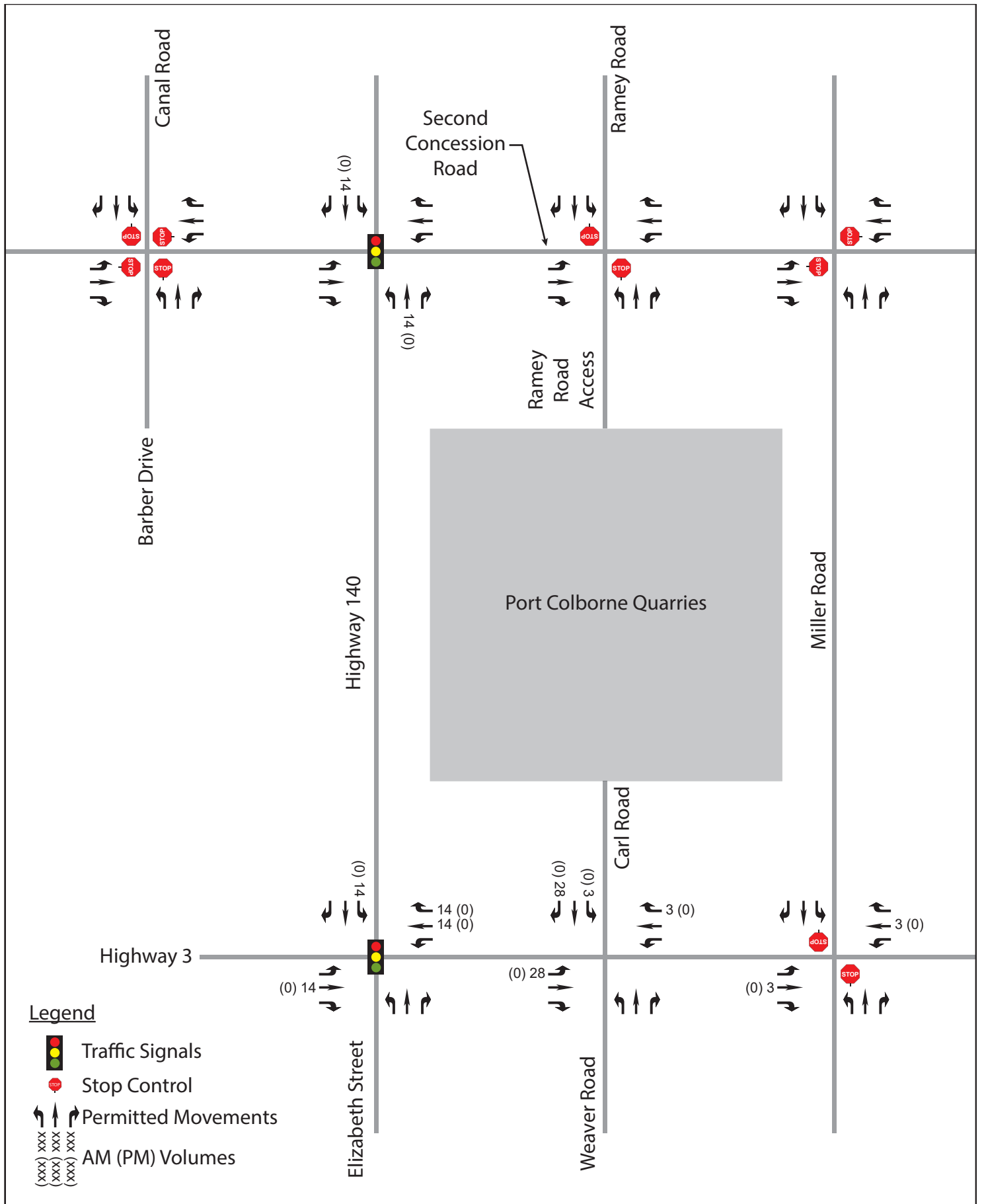
- 100% inbound and outbound trips via Highway 3 access:
 - 45% to/from the North via Highway 140
 - 45% to/from the West via Highway 3
 - 10% to/from the East via Highway 3

Using the above distributions, the estimated 2031, 2036 and, 2041 site-generated peak hour traffic volumes were assigned to the adjacent road network along logical routes, as shown in **Exhibits 6-6 to 6-8**, respectively.

Given the seasonal reduced load restrictions and the rural residential nature of Second Concession Road and Miller Road, the distribution of site-generated traffic did not assign additional traffic to these roadways nor have these roadways been identified as planned trucking routes by PCQI staff.







APPENDIX G

2031 Future Background Detailed Capacity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	158	88	58	220	63	69	113	38	27	86	165
Future Volume (vph)	133	158	88	58	220	63	69	113	38	27	86	165
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.98						
Frt			0.850			0.850		0.962				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1403	1630	1471	1390	1646	1607	0	1554	1716	1240
Flt Permitted	0.610			0.649			0.697			0.653		
Satd. Flow (perm)	959	1535	1403	1113	1471	1368	1208	1607	0	1068	1716	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			96			68		24				179
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
Confl. Peds. (#/hr)	4					4						
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 (%)	11%	14%	6%	2%	19%	7%	1%	6%	1%	7%	2%	20%
Adj. Flow (vph)	145	172	96	63	239	68	75	123	41	29	93	179
Shared Lane Traffic (%)												
Lane Group Flow (vph)	145	172	96	63	239	68	75	164	0	29	93	179
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

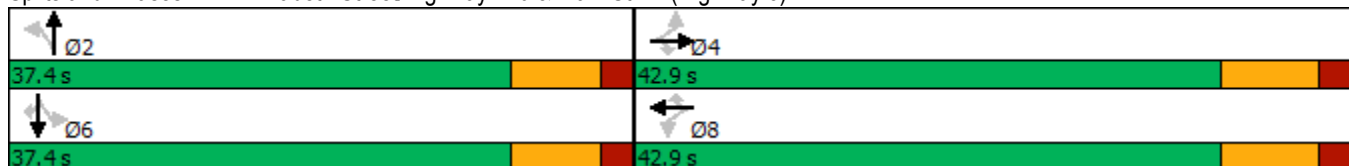


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	18.1	18.1	18.1	18.1	18.1	18.1	30.1	30.1		30.1	30.1	30.1
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.47	0.47		0.47	0.47	0.47
v/c Ratio	0.53	0.39	0.21	0.20	0.57	0.16	0.13	0.21		0.06	0.11	0.26
Control Delay	26.8	20.9	5.3	18.4	25.1	5.6	11.5	10.1		11.0	11.0	3.4
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	26.8	20.9	5.3	18.4	25.1	5.6	11.5	10.1		11.0	11.0	3.4
LOS	C	C	A	B	C	A	B	B		B	B	A
Approach Delay		19.3			20.4			10.5			6.5	
Approach LOS		B			C			B			A	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 63.6
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 15.1
 Intersection LOS: B
 Intersection Capacity Utilization 68.9%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2031 FB AM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	145	172	96	63	239	68	75	164	29	93	179
v/c Ratio	0.53	0.39	0.21	0.20	0.57	0.16	0.13	0.21	0.06	0.11	0.26
Control Delay	26.8	20.9	5.3	18.4	25.1	5.6	11.5	10.1	11.0	11.0	3.4
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	26.8	20.9	5.3	18.4	25.1	5.6	11.5	10.1	11.0	11.0	3.4
Queue Length 50th (m)	15.0	17.0	0.0	5.9	24.9	0.0	4.5	8.7	1.7	5.6	0.0
Queue Length 95th (m)	30.6	31.6	8.8	14.0	44.5	7.5	14.2	24.0	7.0	16.1	10.6
Internal Link Dist (m)	383.5			817.1			1020.5			134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0	25.0	
Base Capacity (vph)	529	848	818	615	813	786	572	773	505	813	681
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	0.27	0.20	0.12	0.10	0.29	0.09	0.13	0.21	0.06	0.11	0.26

Intersection Summary

Lanes, Volumes, Timings
 2: Snider Road & Main St. E. (Highway 3)

2031 FB AM
 12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	214	0	0	319	0	0	0	0	0	0	2
Future Volume (vph)	1	214	0	0	319	0	0	0	0	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865											
Fl _t Protected												
Satd. Flow (prot)	0	1447	0	0	1389	0	0	1716	0	0	1484	0
Fl _t Permitted												
Satd. Flow (perm)	0	1447	0	0	1389	0	0	1716	0	0	1484	0
Link Speed (k/h)	70		80				50			50		
Link Distance (m)	841.1				852.0			103.0			194.5	
Travel Time (s)	43.3				38.3			7.4			14.0	
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%	21%	2%	2%	26%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	233	0	0	347	0	0	0	0	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	234	0	0	347	0	0	0	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6		3.6				0.0			0.0		
Link Offset(m)	0.0				0.0			0.0			0.0	
Crosswalk Width(m)	4.8				4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15		25		15		25		15	
Sign Control	Free				Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2031 FB AM
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	214	0	0	319	0	0	0	0	0	0	2
Future Volume (Veh/h)	1	214	0	0	319	0	0	0	0	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	233	0	0	347	0	0	0	0	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	347			233			584	582	233	582	582	347
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	347			233			584	582	233	582	582	347
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1212			1335			422	424	806	424	424	696
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	234	347	0	2								
Volume Left	1	0	0	0								
Volume Right	0	0	0	2								
cSH	1212	1335	1700	696								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.0	0.0	0.0	0.1								
Control Delay (s)	0.0	0.0	0.0	10.2								
Lane LOS	A		A	B								
Approach Delay (s)	0.0	0.0	0.0	10.2								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			28.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2031 FB AM
 12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	1	205	7	2	298	0	12	0	2	0	2	2
Future Volume (vph)	1	205	7	2	298	0	12	0	2	0	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.982			0.932	
Flt Protected								0.958				
Satd. Flow (prot)	0	1459	1473	0	1413	1716	0	1628	0	0	1607	0
Flt Permitted								0.958				
Satd. Flow (perm)	0	1459	1473	0	1413	1716	0	1628	0	0	1607	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	20%	1%	1%	24%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	1	223	8	2	324	0	13	0	2	0	2	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	224	8	0	326	0	0	15	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

















2031 FB AM
 12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (veh/h)	1	205	7	2	298	0	12	0	2	0	2	2
Future Volume (Veh/h)	1	205	7	2	298	0	12	0	2	0	2	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	223	8	2	324	0	13	0	2	0	2	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	324			231			556	553	223	555	561	324
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324			231			556	553	223	555	561	324
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1236			1343			440	440	817	440	435	719
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	224	8	326	0	15	4						
Volume Left	1	0	2	0	13	0						
Volume Right	0	8	0	0	2	2						
cSH	1236	1700	1343	1700	468	542						
Volume to Capacity	0.00	0.00	0.00	0.00	0.03	0.01						
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.8	0.2						
Control Delay (s)	0.0	0.0	0.1	0.0	12.9	11.7						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.0		0.1		12.9	11.7						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			33.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2031 FB AM
12/14/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	91	6	7	86	2	5	5	4	2	4	1
Future Volume (vph)	1	91	6	7	86	2	5	5	4	2	4	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991			0.997			0.961			0.981	
Flt Protected					0.996			0.982			0.986	
Satd. Flow (prot)	0	1656	0	0	1604	0	0	1625	0	0	1669	0
Flt Permitted					0.996			0.982			0.986	
Satd. Flow (perm)	0	1656	0	0	1604	0	0	1625	0	0	1669	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	5%	1%	2%	9%	2%	2%	1%	2%	2%	1%	2%
Adj. Flow (vph)	1	99	7	8	93	2	5	5	4	2	4	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	0	0	103	0	0	14	0	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2031 FB AM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	91	6	7	86	2	5	5	4	2	4	1
Future Volume (Veh/h)	1	91	6	7	86	2	5	5	4	2	4	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	99	7	8	93	2	5	5	4	2	4	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	95			106			218	216	102	221	218	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			106			218	216	102	221	218	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	99	100	100	99	100
cM capacity (veh/h)	1499			1485			731	680	953	724	678	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	107	103	14	7								
Volume Left	1	8	5	2								
Volume Right	7	2	4	1								
cSH	1499	1485	761	722								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (m)	0.0	0.1	0.4	0.2								
Control Delay (s)	0.1	0.6	9.8	10.0								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.1	0.6	9.8	10.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			19.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2031 FB AM
12/14/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	75	109	6	3	114	44	3	25	9	34	18	67
Future Volume (vph)	75	109	6	3	114	44	3	25	9	34	18	67
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.963			0.966			0.924	
Flt Protected		0.981			0.999			0.996			0.986	
Satd. Flow (prot)	0	1600	0	0	1506	0	0	1663	0	0	1572	0
Flt Permitted		0.981			0.999			0.996			0.986	
Satd. Flow (perm)	0	1600	0	0	1506	0	0	1663	0	0	1572	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1			1	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 (%)	4%	9%	2%	2%	15%	4%	1%	1%	2%	2%	2%	1%
Adj. Flow (vph)	82	118	7	3	124	48	3	27	10	37	20	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	0	0	175	0	0	40	0	0	130	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2031 FB AM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	109	6	3	114	44	3	25	9	34	18	67
Future Volume (Veh/h)	75	109	6	3	114	44	3	25	9	34	18	67
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	82	118	7	3	124	48	3	27	10	37	20	73
Pedestrians					1						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	173			125			522	464	122	465	444	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	173			125			522	464	122	465	444	149
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			99	94	99	92	96	92
cM capacity (veh/h)	1391			1462			395	466	928	457	477	900
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	207	175	40	130								
Volume Left	82	3	3	37								
Volume Right	7	48	10	73								
cSH	1391	1462	524	637								
Volume to Capacity	0.06	0.00	0.08	0.20								
Queue Length 95th (m)	1.5	0.0	2.0	6.1								
Control Delay (s)	3.4	0.1	12.4	12.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.4	0.1	12.4	12.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			45.1%		ICU Level of Service				A			
Analysis Period (min)			15									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	258	46	26	280	55	53	124	37	71	108	317
Future Volume (vph)	232	258	46	26	280	55	53	124	37	71	108	317
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.966				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1649	0	1614	1716	1352
Flt Permitted	0.544			0.576			0.682			0.647		
Satd. Flow (perm)	858	1535	1365	988	1683	1473	1170	1649	0	1099	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			60		21				345
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	252	280	50	28	304	60	58	135	40	77	117	345
Shared Lane Traffic (%)												
Lane Group Flow (vph)	252	280	50	28	304	60	58	175	0	77	117	345
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

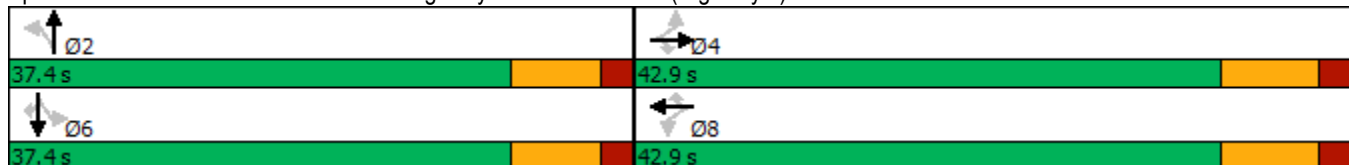


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	26.1	26.1	26.1	26.1	26.1	26.1	30.4	30.4		30.4	30.4	30.4
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36	0.42	0.42		0.42	0.42	0.42
v/c Ratio	0.81	0.50	0.09	0.08	0.50	0.10	0.12	0.25		0.17	0.16	0.45
Control Delay	41.2	20.6	3.7	14.3	20.2	4.4	16.3	15.0		16.9	16.2	4.3
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	41.2	20.6	3.7	14.3	20.2	4.4	16.3	15.0		16.9	16.2	4.3
LOS	D	C	A	B	C	A	B	B		B	B	A
Approach Delay		28.1			17.3			15.3			8.7	
Approach LOS		C			B			B			A	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 72
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 18.0
 Intersection Capacity Utilization 73.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	252	280	50	28	304	60	58	175	77	117	345
v/c Ratio	0.81	0.50	0.09	0.08	0.50	0.10	0.12	0.25	0.17	0.16	0.45
Control Delay	41.2	20.6	3.7	14.3	20.2	4.4	16.3	15.0	16.9	16.2	4.3
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	41.2	20.6	3.7	14.3	20.2	4.4	16.3	15.0	16.9	16.2	4.3
Queue Length 50th (m)	31.2	30.0	0.0	2.5	32.4	0.0	5.0	13.9	6.8	10.3	0.0
Queue Length 95th (m)	#66.9	50.2	5.0	7.3	53.1	6.5	14.2	31.7	18.0	23.8	16.6
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	421	755	701	486	828	755	493	707	463	723	769
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	0.37	0.07	0.06	0.37	0.08	0.12	0.25	0.17	0.16	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Volume (vph)	1	350	0	1	334	0	1	1	0	0	0	1	
Future Volume (vph)	1	350	0	1	334	0	1	1	0	0	0	1	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt												0.865	
Flt Protected									0.976				
Satd. Flow (prot)	0	1536	0	0	1667	0	0	1675	0	0	1484	0	
Flt Permitted									0.976				
Satd. Flow (perm)	0	1536	0	0	1667	0	0	1675	0	0	1484	0	
Link Speed (k/h)	70				80				50		50		
Link Distance (m)	841.1				852.0				103.0		194.5		
Travel Time (s)	43.3				38.3				7.4		14.0		
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%	
Adj. Flow (vph)	1	380	0	1	363	0	1	1	0	0	0	1	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	381	0	0	364	0	0	2	0	0	1	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	3.6				3.6				0.0		0.0		
Link Offset(m)	0.0				0.0				0.0		0.0		
Crosswalk Width(m)	4.8				4.8				4.8		4.8		
Two way Left Turn Lane													
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	
Turning Speed (k/h)	25	15		25	15		25	15		25	15		
Sign Control	Free				Free				Stop		Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2031 FB PM
 12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	350	0	1	334	0	1	1	0	0	0	1
Future Volume (Veh/h)	1	350	0	1	334	0	1	1	0	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	380	0	1	363	0	1	1	0	0	0	1
Pedestrians												1
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												0
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	364			380			748	748	380	748	748	364
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	364			380			748	748	380	748	748	364
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1194			1178			327	340	667	327	340	680
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	381	364	2	1								
Volume Left	1	1	1	0								
Volume Right	0	0	0	1								
cSH	1194	1178	334	680								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (m)	0.0	0.0	0.1	0.0								
Control Delay (s)	0.0	0.0	15.9	10.3								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.0	0.0	15.9	10.3								
Approach LOS			C	B								
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			30.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2031 FB PM
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	0	331	16	0	317	0	9	0	3	0	0	2
Future Volume (vph)	0	331	16	0	317	0	9	0	3	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.969			0.865	
Flt Protected								0.963				
Satd. Flow (prot)	0	1549	1473	0	1667	1716	0	1613	0	0	1499	0
Flt Permitted								0.963				
Satd. Flow (perm)	0	1549	1473	0	1667	1716	0	1613	0	0	1499	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	13%	1%	1%	5%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	0	360	17	0	345	0	10	0	3	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	360	17	0	345	0	0	13	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

















2031 FB PM
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↔	↔		↔	↔		↔			↔			
Traffic Volume (veh/h)	0	331	16	0	317	0	9	0	3	0	0	2		
Future Volume (Veh/h)	0	331	16	0	317	0	9	0	3	0	0	2		
Sign Control		Free			Free			Stop			Stop			
Grade		0%			0%			0%			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		
Hourly flow rate (vph)	0	360	17	0	345	0	10	0	3	0	0	2		
Pedestrians														
Lane Width (m)														
Walking Speed (m/s)														
Percent Blockage														
Right turn flare (veh)														
Median type	None					None								
Median storage (veh)														
Upstream signal (m)														
pX, platoon unblocked														
vC, conflicting volume	345		377		707		705		360		708		722	345
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	345		377		707		705		360		708		722	345
tC, single (s)	4.1		4.1		7.1		6.5		6.2		7.1		6.5	6.2
tC, 2 stage (s)														
tF (s)	2.2		2.2		3.5		4.0		3.3		3.5		4.0	3.3
p0 queue free %	100		100		97		100		100		100		100	100
cM capacity (veh/h)	1214		1187		350		361		684		348		353	700
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1								
Volume Total	360	17	345	0	13	2								
Volume Left	0	0	0	0	10	0								
Volume Right	0	17	0	0	3	2								
cSH	1214	1700	1187	1700	395	700								
Volume to Capacity	0.00	0.01	0.00	0.00	0.03	0.00								
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.8	0.1								
Control Delay (s)	0.0	0.0	0.0	0.0	14.4	10.2								
Lane LOS					B	B								
Approach Delay (s)	0.0		0.0		14.4		10.2							
Approach LOS					B	B								
Intersection Summary														
Average Delay			0.3											
Intersection Capacity Utilization			34.8%		ICU Level of Service		A							
Analysis Period (min)			15											

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2031 FB PM
12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	141	6	6	103	2	7	4	8	2	10	2
Future Volume (vph)	4	141	6	6	103	2	7	4	8	2	10	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.998			0.942			0.982	
Flt Protected		0.999			0.997			0.981			0.993	
Satd. Flow (prot)	0	1720	0	0	1619	0	0	1594	0	0	1685	0
Flt Permitted		0.999			0.997			0.981			0.993	
Satd. Flow (perm)	0	1720	0	0	1619	0	0	1594	0	0	1685	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	1%	1%	2%	8%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	4	153	7	7	112	2	8	4	9	2	11	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	0	121	0	0	21	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2031 FB PM
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	4	141	6	6	103	2	7	4	8	2	10	2
Future Volume (Veh/h)	4	141	6	6	103	2	7	4	8	2	10	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	4	153	7	7	112	2	8	4	9	2	11	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	114			160			299	292	156	302	295	113
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			160			299	292	156	302	295	113
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	99	100	98	100
cM capacity (veh/h)	1475			1419			641	615	889	636	613	940
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	164	121	21	15								
Volume Left	4	7	8	2								
Volume Right	7	2	9	2								
cSH	1475	1419	722	646								
Volume to Capacity	0.00	0.00	0.03	0.02								
Queue Length 95th (m)	0.1	0.1	0.7	0.6								
Control Delay (s)	0.2	0.5	10.1	10.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	10.1	10.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			19.8%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2031 FB PM
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	88	153	4	7	110	19	5	20	3	37	25	83
Future Volume (vph)	88	153	4	7	110	19	5	20	3	37	25	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.981			0.986			0.923	
Flt Protected		0.982			0.997			0.992			0.987	
Satd. Flow (prot)	0	1686	0	0	1630	0	0	1693	0	0	1571	0
Flt Permitted		0.982			0.997			0.992			0.987	
Satd. Flow (perm)	0	1686	0	0	1630	0	0	1693	0	0	1571	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)	1					1			3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	96	166	4	8	120	21	5	22	3	40	27	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	266	0	0	149	0	0	30	0	0	157	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

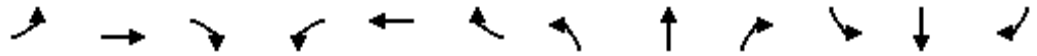
2031 FB PM
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	88	153	4	7	110	19	5	20	3	37	25	83
Future Volume (Veh/h)	88	153	4	7	110	19	5	20	3	37	25	83
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	96	166	4	8	120	21	5	22	3	40	27	90
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	142			170			610	518	171	524	510	132
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	142			170			610	518	171	524	510	132
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			98	95	100	90	94	90
cM capacity (veh/h)	1434			1413			331	429	871	421	433	917
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	266	149	30	157								
Volume Left	96	8	5	40								
Volume Right	4	21	3	90								
cSH	1434	1413	430	614								
Volume to Capacity	0.07	0.01	0.07	0.26								
Queue Length 95th (m)	1.7	0.1	1.8	8.1								
Control Delay (s)	3.1	0.5	14.0	12.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.1	0.5	14.0	12.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			46.6%		ICU Level of Service				A			
Analysis Period (min)			15									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	152	56	40	194	36	116	111	42	19	64	132
Future Volume (vph)	144	152	56	40	194	36	116	111	42	19	64	132
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.959				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1699	1365	1662	1683	1473	1630	1638	0	1614	1699	1352
Flt Permitted	0.626			0.653			0.711			0.651		
Satd. Flow (perm)	987	1699	1365	1143	1683	1473	1220	1638	0	1106	1699	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61			60		27				143
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	3%	9%	0%	4%	1%	2%	3%	1%	3%	3%	10%
Adj. Flow (vph)	157	165	61	43	211	39	126	121	46	21	70	143
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	165	61	43	211	39	126	167	0	21	70	143
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

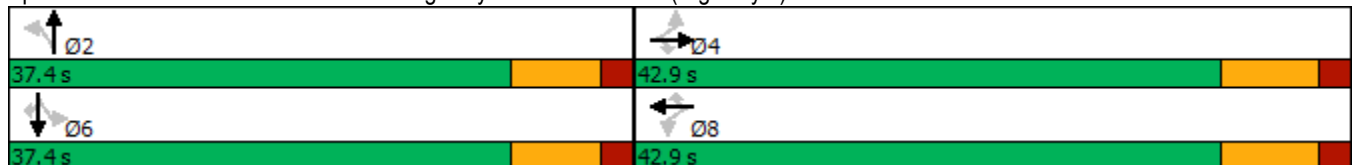


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	18.2	18.2	18.2	18.2	18.2	18.2	30.1	30.1		30.1	30.1	30.1
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.47	0.47		0.47	0.47	0.47
v/c Ratio	0.56	0.34	0.14	0.13	0.44	0.08	0.22	0.21		0.04	0.09	0.20
Control Delay	27.5	19.8	5.7	17.3	21.4	3.1	12.3	10.0		11.0	10.9	3.3
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	27.5	19.8	5.7	17.3	21.4	3.1	12.3	10.0		11.0	10.9	3.3
LOS	C	B	A	B	C	A	B	A		B	B	A
Approach Delay		20.7			18.4			11.0			6.3	
Approach LOS		C			B			B			A	

Intersection Summary

Area Type:	Other
Cycle Length:	80.3
Actuated Cycle Length:	63.6
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.56
Intersection Signal Delay:	15.0
Intersection LOS:	B
Intersection Capacity Utilization:	61.5%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2031 FB SAT

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	157	165	61	43	211	39	126	167	21	70	143
v/c Ratio	0.56	0.34	0.14	0.13	0.44	0.08	0.22	0.21	0.04	0.09	0.20
Control Delay	27.5	19.8	5.7	17.3	21.4	3.1	12.3	10.0	11.0	10.9	3.3
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	27.5	19.8	5.7	17.3	21.4	3.1	12.3	10.0	11.0	10.9	3.3
Queue Length 50th (m)	16.3	16.0	0.0	3.9	21.1	0.0	7.9	8.6	1.2	4.1	0.0
Queue Length 95th (m)	33.2	29.8	7.1	10.4	37.6	3.7	22.2	23.9	5.6	12.8	9.5
Internal Link Dist (m)	383.5			817.1			1020.5			134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0	25.0	
Base Capacity (vph)	544	938	780	631	928	840	577	789	523	804	715
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	0.29	0.18	0.08	0.07	0.23	0.05	0.22	0.21	0.04	0.09	0.20

Intersection Summary

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2031 FB SAT
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	235	0	0	245	0	0	0	0	0	0	0
Future Volume (vph)	0	235	0	0	245	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	1699	0	0	1716	0	0	1716	0	0	1716	0
Flt Permitted												
Satd. Flow (perm)	0	1699	0	0	1716	0	0	1716	0	0	1716	0
Link Speed (k/h)		70			80			50			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			7.4			14.0	
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%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	255	0	0	266	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	255	0	0	266	0	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	17.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2031 FB SAT
 12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	235	0	0	245	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	235	0	0	245	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	255	0	0	266	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	266			255			521	521	255	521	521	266
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			255			521	521	255	521	521	266
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1298			1310			466	460	784	466	460	773
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	255	266	0	0								
Volume Left	0	0	0	0								
Volume Right	0	0	0	0								
cSH	1298	1310	1700	1700								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (m)	0.0	0.0	0.0	0.0								
Control Delay (s)	0.0	0.0	0.0	0.0								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	0.0	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.0									
Intersection Capacity Utilization			17.3%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2031 FB SAT
 12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (vph)	0	228	7	1	236	2	2	1	2	0	1	0
Future Volume (vph)	0	228	7	1	236	2	2	1	2	0	1	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.946				
Flt Protected								0.980				
Satd. Flow (prot)	0	1699	1473	0	1716	1458	0	1597	0	0	1716	0
Flt Permitted								0.980				
Satd. Flow (perm)	0	1699	1473	0	1716	1458	0	1597	0	0	1716	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	3%	1%	1%	2%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	0	248	8	1	257	2	2	1	2	0	1	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	8	0	258	2	0	5	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

















2031 FB SAT
 12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕↗			↕↗	
Traffic Volume (veh/h)	0	228	7	1	236	2	2	1	2	0	1	0
Future Volume (Veh/h)	0	228	7	1	236	2	2	1	2	0	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	248	8	1	257	2	2	1	2	0	1	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	259			256			508	509	248	510	515	257
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	259			256			508	509	248	510	515	257
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1306			1315			476	467	791	472	463	784
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	248	8	258	2	5	1						
Volume Left	0	0	1	0	2	0						
Volume Right	0	8	0	2	2	0						
cSH	1306	1700	1315	1700	564	463						
Volume to Capacity	0.00	0.00	0.00	0.00	0.01	0.00						
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.2	0.1						
Control Delay (s)	0.0	0.0	0.0	0.0	11.4	12.8						
Lane LOS			A		B	B						
Approach Delay (s)	0.0		0.0		11.4	12.8						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization			30.2%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2031 FB SAT
12/14/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	114	8	6	86	1	3	2	9	4	7	3
Future Volume (vph)	0	114	8	6	86	1	3	2	9	4	7	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991			0.999			0.910			0.973	
Flt Protected					0.997			0.990			0.987	
Satd. Flow (prot)	0	1717	0	0	1724	0	0	1551	0	0	1656	0
Flt Permitted					0.997			0.990			0.987	
Satd. Flow (perm)	0	1717	0	0	1724	0	0	1551	0	0	1656	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	1%	1%	2%	1%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	0	124	9	7	93	1	3	2	10	4	8	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	101	0	0	15	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2031 FB SAT
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	114	8	6	86	1	3	2	9	4	7	3
Future Volume (Veh/h)	0	114	8	6	86	1	3	2	9	4	7	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	124	9	7	93	1	3	2	10	4	8	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	94			133			243	236	128	247	240	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	94			133			243	236	128	247	240	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	99	99	100
cM capacity (veh/h)	1500			1452			702	663	921	695	659	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	101	15	15								
Volume Left	0	7	3	4								
Volume Right	9	1	10	3								
cSH	1500	1452	827	714								
Volume to Capacity	0.00	0.00	0.02	0.02								
Queue Length 95th (m)	0.0	0.1	0.4	0.5								
Control Delay (s)	0.0	0.6	9.4	10.1								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.6	9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			20.3%	ICU Level of Service		A						
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2031 FB SAT
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	68	112	4	6	96	12	2	25	4	23	23	86
Future Volume (vph)	68	112	4	6	96	12	2	25	4	23	23	86
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.986			0.984			0.912	
Flt Protected		0.982			0.997			0.997			0.991	
Satd. Flow (prot)	0	1697	0	0	1703	0	0	1698	0	0	1553	0
Flt Permitted		0.982			0.997			0.997			0.991	
Satd. Flow (perm)	0	1697	0	0	1703	0	0	1698	0	0	1553	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)									3	3		
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 (%)	1%	1%	0%	1%	1%	1%	1%	1%	2%	1%	2%	2%
Adj. Flow (vph)	74	122	4	7	104	13	2	27	4	25	25	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	200	0	0	124	0	0	33	0	0	143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2031 FB SAT
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	68	112	4	6	96	12	2	25	4	23	23	86
Future Volume (Veh/h)	68	112	4	6	96	12	2	25	4	23	23	86
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	74	122	4	7	104	13	2	27	4	25	25	93
Pedestrians					3							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	117			126			502	403	127	417	398	110
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	117			126			502	403	127	417	398	110
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	95	100	95	95	90
cM capacity (veh/h)	1478			1467			400	508	921	501	510	943
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	200	124	33	143								
Volume Left	74	7	2	25								
Volume Right	4	13	4	93								
cSH	1478	1467	528	724								
Volume to Capacity	0.05	0.00	0.06	0.20								
Queue Length 95th (m)	1.3	0.1	1.6	5.9								
Control Delay (s)	3.1	0.5	12.3	11.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.1	0.5	12.3	11.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization			39.2%		ICU Level of Service				A			
Analysis Period (min)			15									

APPENDIX H

2036 Future Background Detailed Capacity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	178	100	65	263	88	69	113	38	29	94	180
Future Volume (vph)	165	178	100	65	263	88	69	113	38	29	94	180
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.98						
Frt			0.850			0.850		0.962				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1403	1630	1471	1390	1646	1607	0	1554	1716	1240
Flt Permitted	0.564			0.636			0.691			0.653		
Satd. Flow (perm)	887	1535	1403	1091	1471	1368	1197	1607	0	1068	1716	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			96		24				196
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
Confl. Peds. (#/hr)	4					4						
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 (%)	11%	14%	6%	2%	19%	7%	1%	6%	1%	7%	2%	20%
Adj. Flow (vph)	179	193	109	71	286	96	75	123	41	32	102	196
Shared Lane Traffic (%)												
Lane Group Flow (vph)	179	193	109	71	286	96	75	164	0	32	102	196
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

2036 FB AM
 12/14/2023

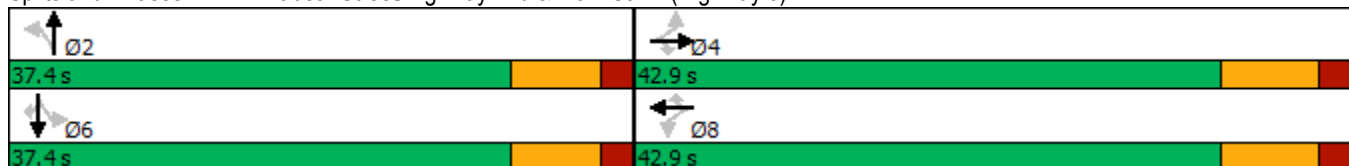


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	20.7	20.7	20.7	20.7	20.7	20.7	30.2	30.2		30.2	30.2	30.2
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.31	0.45	0.45		0.45	0.45	0.45
v/c Ratio	0.65	0.40	0.21	0.21	0.62	0.19	0.14	0.22		0.07	0.13	0.29
Control Delay	31.0	20.1	4.5	17.6	25.6	4.7	13.6	11.8		13.2	13.1	3.8
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	31.0	20.1	4.5	17.6	25.6	4.7	13.6	11.8		13.2	13.1	3.8
LOS	C	C	A	B	C	A	B	B		B	B	A
Approach Delay		20.6			19.9			12.4			7.6	
Approach LOS		C			B			B			A	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 66.4
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 16.2
 Intersection LOS: B
 Intersection Capacity Utilization 71.1%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	179	193	109	71	286	96	75	164	32	102	196
v/c Ratio	0.65	0.40	0.21	0.21	0.62	0.19	0.14	0.22	0.07	0.13	0.29
Control Delay	31.0	20.1	4.5	17.6	25.6	4.7	13.6	11.8	13.2	13.1	3.8
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	31.0	20.1	4.5	17.6	25.6	4.7	13.6	11.8	13.2	13.1	3.8
Queue Length 50th (m)	19.6	19.3	0.0	6.6	31.0	0.0	5.0	9.6	2.1	6.8	0.0
Queue Length 95th (m)	38.9	34.5	8.8	15.1	52.7	8.3	16.4	27.8	8.6	20.1	12.5
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	471	815	796	579	781	772	545	745	486	781	671
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	0.38	0.24	0.14	0.12	0.37	0.12	0.14	0.22	0.07	0.13	0.29

Intersection Summary

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2036 FB AM
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	242	0	0	391	0	0	0	0	0	0	2
Future Volume (vph)	1	242	0	0	391	0	0	0	0	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t												0.865
Fl _t Protected												
Satd. Flow (prot)	0	1447	0	0	1389	0	0	1716	0	0	1484	0
Fl _t Permitted												
Satd. Flow (perm)	0	1447	0	0	1389	0	0	1716	0	0	1484	0
Link Speed (k/h)		70			80			50			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			7.4			14.0	
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%	21%	2%	2%	26%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	263	0	0	425	0	0	0	0	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	425	0	0	0	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2036 FB AM
 12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	242	0	0	391	0	0	0	0	0	0	2
Future Volume (Veh/h)	1	242	0	0	391	0	0	0	0	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	263	0	0	425	0	0	0	0	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	425			263			692	690	263	690	690	425
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425			263			692	690	263	690	690	425
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1134			1301			357	368	776	359	368	629
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	264	425	0	2								
Volume Left	1	0	0	0								
Volume Right	0	0	0	2								
cSH	1134	1301	1700	629								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.0	0.0	0.0	0.1								
Control Delay (s)	0.0	0.0	0.0	10.7								
Lane LOS	A		A	B								
Approach Delay (s)	0.0	0.0	0.0	10.7								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.0									
Intersection Capacity Utilization			32.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2036 FB AM
 12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	1	232	7	2	368	0	12	0	2	0	2	2
Future Volume (vph)	1	232	7	2	368	0	12	0	2	0	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.982			0.932	
Flt Protected								0.958				
Satd. Flow (prot)	0	1459	1473	0	1413	1716	0	1628	0	0	1607	0
Flt Permitted								0.958				
Satd. Flow (perm)	0	1459	1473	0	1413	1716	0	1628	0	0	1607	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	20%	1%	1%	24%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	1	252	8	2	400	0	13	0	2	0	2	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	253	8	0	402	0	0	15	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

















2036 FB AM
 12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕↗			↕↗	
Traffic Volume (veh/h)	1	232	7	2	368	0	12	0	2	0	2	2
Future Volume (Veh/h)	1	232	7	2	368	0	12	0	2	0	2	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	252	8	2	400	0	13	0	2	0	2	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	400			260			661	658	252	660	666	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	400			260			661	658	252	660	666	400
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	99	100
cM capacity (veh/h)	1159			1310			374	383	787	375	379	652
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	253	8	402	0	15	4						
Volume Left	1	0	2	0	13	0						
Volume Right	0	8	0	0	2	2						
cSH	1159	1700	1310	1700	402	480						
Volume to Capacity	0.00	0.00	0.00	0.00	0.04	0.01						
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.9	0.2						
Control Delay (s)	0.0	0.0	0.1	0.0	14.3	12.6						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.0		0.1		14.3	12.6						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			37.8%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2036 FB AM
12/14/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	91	6	7	86	2	5	5	4	2	4	1
Future Volume (vph)	1	91	6	7	86	2	5	5	4	2	4	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991			0.997			0.961			0.981	
Flt Protected					0.996			0.982			0.986	
Satd. Flow (prot)	0	1656	0	0	1604	0	0	1625	0	0	1669	0
Flt Permitted					0.996			0.982			0.986	
Satd. Flow (perm)	0	1656	0	0	1604	0	0	1625	0	0	1669	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	5%	1%	2%	9%	2%	2%	1%	2%	2%	1%	2%
Adj. Flow (vph)	1	99	7	8	93	2	5	5	4	2	4	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	0	0	103	0	0	14	0	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2036 FB AM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	91	6	7	86	2	5	5	4	2	4	1
Future Volume (Veh/h)	1	91	6	7	86	2	5	5	4	2	4	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	99	7	8	93	2	5	5	4	2	4	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	95			106			218	216	102	221	218	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			106			218	216	102	221	218	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	99	100	100	99	100
cM capacity (veh/h)	1499			1485			731	680	953	724	678	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	107	103	14	7								
Volume Left	1	8	5	2								
Volume Right	7	2	4	1								
cSH	1499	1485	761	722								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (m)	0.0	0.1	0.4	0.2								
Control Delay (s)	0.1	0.6	9.8	10.0								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.1	0.6	9.8	10.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			19.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2036 FB AM
12/14/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	75	109	6	3	114	44	3	25	9	34	18	67
Future Volume (vph)	75	109	6	3	114	44	3	25	9	34	18	67
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.963			0.966			0.924	
Flt Protected		0.981			0.999			0.996			0.986	
Satd. Flow (prot)	0	1600	0	0	1506	0	0	1663	0	0	1572	0
Flt Permitted		0.981			0.999			0.996			0.986	
Satd. Flow (perm)	0	1600	0	0	1506	0	0	1663	0	0	1572	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		1	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 (%)	4%	9%	2%	2%	15%	4%	1%	1%	2%	2%	2%	1%
Adj. Flow (vph)	82	118	7	3	124	48	3	27	10	37	20	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	0	0	175	0	0	40	0	0	130	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2036 FB AM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	109	6	3	114	44	3	25	9	34	18	67
Future Volume (Veh/h)	75	109	6	3	114	44	3	25	9	34	18	67
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	82	118	7	3	124	48	3	27	10	37	20	73
Pedestrians					1						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	173			125			522	464	122	465	444	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	173			125			522	464	122	465	444	149
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			99	94	99	92	96	92
cM capacity (veh/h)	1391			1462			395	466	928	457	477	900
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	207	175	40	130								
Volume Left	82	3	3	37								
Volume Right	7	48	10	73								
cSH	1391	1462	524	637								
Volume to Capacity	0.06	0.00	0.08	0.20								
Queue Length 95th (m)	1.5	0.0	2.0	6.1								
Control Delay (s)	3.4	0.1	12.4	12.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.4	0.1	12.4	12.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			45.1%		ICU Level of Service				A			
Analysis Period (min)			15									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	291	52	29	316	63	53	124	37	78	118	345
Future Volume (vph)	262	291	52	29	316	63	53	124	37	78	118	345
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.966				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1649	0	1614	1716	1352
Flt Permitted	0.504			0.536			0.675			0.647		
Satd. Flow (perm)	795	1535	1365	920	1683	1473	1158	1649	0	1099	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			68		21				375
Link Speed (k/h)		70			70			50			60	
Link Distance (m)		407.5			841.1			1044.5			158.6	
Travel Time (s)		21.0			43.3			75.2			9.5	
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	285	316	57	32	343	68	58	135	40	85	128	375
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	316	57	32	343	68	58	175	0	85	128	375
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

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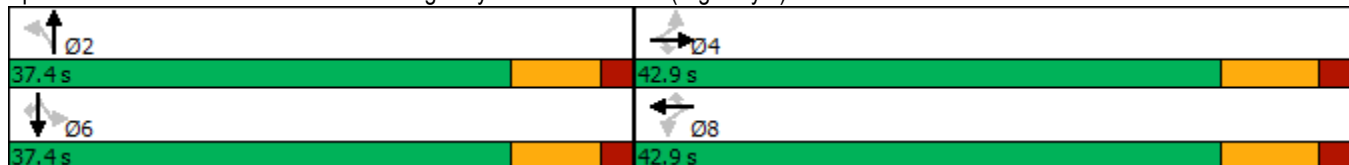


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	30.7	30.7	30.7	30.7	30.7	30.7	30.2	30.2		30.2	30.2	30.2
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		0.40	0.40	0.40
v/c Ratio	0.89	0.51	0.10	0.09	0.51	0.11	0.13	0.26		0.20	0.19	0.49
Control Delay	52.6	20.2	4.2	14.2	19.8	4.2	17.4	16.2		18.4	17.5	4.6
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	52.6	20.2	4.2	14.2	19.8	4.2	17.4	16.2		18.4	17.5	4.6
LOS	D	C	A	B	B	A	B	B		B	B	A
Approach Delay		32.8			17.0			16.5			9.4	
Approach LOS		C			B			B			A	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 76.3
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 20.0
 Intersection Capacity Utilization 77.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	285	316	57	32	343	68	58	175	85	128	375
v/c Ratio	0.89	0.51	0.10	0.09	0.51	0.11	0.13	0.26	0.20	0.19	0.49
Control Delay	52.6	20.2	4.2	14.2	19.8	4.2	17.4	16.2	18.4	17.5	4.6
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	52.6	20.2	4.2	14.2	19.8	4.2	17.4	16.2	18.4	17.5	4.6
Queue Length 50th (m)	38.9	34.8	0.0	2.9	37.6	0.0	6.0	16.7	9.1	13.6	0.0
Queue Length 95th (m)	#85.1	57.6	6.1	8.2	60.7	6.9	14.2	31.7	19.5	25.9	17.1
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	367	709	662	424	777	717	458	665	435	679	762
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	0.78	0.45	0.09	0.08	0.44	0.09	0.13	0.26	0.20	0.19	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	396	0	1	378	0	1	1	0	0	0	1
Future Volume (vph)	1	396	0	1	378	0	1	1	0	0	0	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												0.865
Flt Protected								0.976				
Satd. Flow (prot)	0	1535	0	0	1667	0	0	1675	0	0	1484	0
Flt Permitted								0.976				
Satd. Flow (perm)	0	1535	0	0	1667	0	0	1675	0	0	1484	0
Link Speed (k/h)	70		80				50			50		
Link Distance (m)	841.1				852.0			103.0			194.5	
Travel Time (s)	43.3				38.3			7.4			14.0	
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	430	0	1	411	0	1	1	0	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	431	0	0	412	0	0	2	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6		3.6				0.0			0.0		
Link Offset(m)	0.0				0.0			0.0			0.0	
Crosswalk Width(m)	4.8				4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15		25		15		25		15	
Sign Control	Free				Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2036 FB PM
 12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	396	0	1	378	0	1	1	0	0	0	1
Future Volume (Veh/h)	1	396	0	1	378	0	1	1	0	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	430	0	1	411	0	1	1	0	0	0	1
Pedestrians												1
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												0
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	412			430			846	846	430	846	846	412
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	412			430			846	846	430	846	846	412
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1146			1129			281	298	625	280	298	639
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	431	412	2	1								
Volume Left	1	1	1	0								
Volume Right	0	0	0	1								
cSH	1146	1129	290	639								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (m)	0.0	0.0	0.2	0.0								
Control Delay (s)	0.0	0.0	17.5	10.6								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.0	0.0	17.5	10.6								
Approach LOS			C	B								
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			33.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

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 12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (vph)	0	374	16	0	359	0	9	0	3	0	0	2
Future Volume (vph)	0	374	16	0	359	0	9	0	3	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.969			0.865	
Flt Protected								0.963				
Satd. Flow (prot)	0	1549	1473	0	1667	1716	0	1613	0	0	1499	0
Flt Permitted								0.963				
Satd. Flow (perm)	0	1549	1473	0	1667	1716	0	1613	0	0	1499	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	13%	1%	1%	5%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	0	407	17	0	390	0	10	0	3	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	407	17	0	390	0	0	13	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔		↔			↔	
Traffic Volume (veh/h)	0	374	16	0	359	0	9	0	3	0	0	2
Future Volume (Veh/h)	0	374	16	0	359	0	9	0	3	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	407	17	0	390	0	10	0	3	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	390			424			799	797	407	800	814	390
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	390			424			799	797	407	800	814	390
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1169			1141			304	319	644	302	312	661
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	407	17	390	0	13	2						
Volume Left	0	0	0	0	10	0						
Volume Right	0	17	0	0	3	2						
cSH	1169	1700	1141	1700	346	661						
Volume to Capacity	0.00	0.01	0.00	0.00	0.04	0.00						
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.9	0.1						
Control Delay (s)	0.0	0.0	0.0	0.0	15.8	10.5						
Lane LOS					C	B						
Approach Delay (s)	0.0		0.0		15.8	10.5						
Approach LOS					C	B						
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			37.2%	ICU Level of Service	A							
Analysis Period (min)	15											

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2036 FB PM
12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	141	6	6	103	2	7	4	8	2	10	2
Future Volume (vph)	4	141	6	6	103	2	7	4	8	2	10	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.994			0.998			0.942			0.982	
Fl _t Protected		0.999			0.997			0.981			0.993	
Satd. Flow (prot)	0	1720	0	0	1619	0	0	1594	0	0	1685	0
Fl _t Permitted		0.999			0.997			0.981			0.993	
Satd. Flow (perm)	0	1720	0	0	1619	0	0	1594	0	0	1685	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	1%	1%	2%	8%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	4	153	7	7	112	2	8	4	9	2	11	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	0	121	0	0	21	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2036 FB PM
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	4	141	6	6	103	2	7	4	8	2	10	2
Future Volume (Veh/h)	4	141	6	6	103	2	7	4	8	2	10	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	4	153	7	7	112	2	8	4	9	2	11	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	114			160			299	292	156	302	295	113
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			160			299	292	156	302	295	113
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	99	100	98	100
cM capacity (veh/h)	1475			1419			641	615	889	636	613	940
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	164	121	21	15								
Volume Left	4	7	8	2								
Volume Right	7	2	9	2								
cSH	1475	1419	722	646								
Volume to Capacity	0.00	0.00	0.03	0.02								
Queue Length 95th (m)	0.1	0.1	0.7	0.6								
Control Delay (s)	0.2	0.5	10.1	10.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	10.1	10.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			19.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2036 FB PM
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	88	153	4	7	110	19	5	20	3	37	25	83
Future Volume (vph)	88	153	4	7	110	19	5	20	3	37	25	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.981			0.986			0.923	
Flt Protected		0.982			0.997			0.992			0.987	
Satd. Flow (prot)	0	1686	0	0	1630	0	0	1693	0	0	1571	0
Flt Permitted		0.982			0.997			0.992			0.987	
Satd. Flow (perm)	0	1686	0	0	1630	0	0	1693	0	0	1571	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)	1					1			3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	96	166	4	8	120	21	5	22	3	40	27	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	266	0	0	149	0	0	30	0	0	157	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

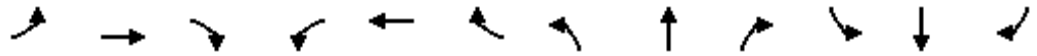
2036 FB PM
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	88	153	4	7	110	19	5	20	3	37	25	83
Future Volume (Veh/h)	88	153	4	7	110	19	5	20	3	37	25	83
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	96	166	4	8	120	21	5	22	3	40	27	90
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	142			170			610	518	171	524	510	132
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	142			170			610	518	171	524	510	132
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			98	95	100	90	94	90
cM capacity (veh/h)	1434			1413			331	429	871	421	433	917
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	266	149	30	157								
Volume Left	96	8	5	40								
Volume Right	4	21	3	90								
cSH	1434	1413	430	614								
Volume to Capacity	0.07	0.01	0.07	0.26								
Queue Length 95th (m)	1.7	0.1	1.8	8.1								
Control Delay (s)	3.1	0.5	14.0	12.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.1	0.5	14.0	12.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			46.6%		ICU Level of Service				A			
Analysis Period (min)			15									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	210	78	56	268	50	116	111	42	24	80	165
Future Volume (vph)	199	210	78	56	268	50	116	111	42	24	80	165
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.959				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1699	1365	1662	1683	1473	1630	1638	0	1614	1699	1352
Flt Permitted	0.560			0.616			0.701			0.651		
Satd. Flow (perm)	883	1699	1365	1078	1683	1473	1203	1638	0	1106	1699	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85			60		27				179
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	3%	9%	0%	4%	1%	2%	3%	1%	3%	3%	10%
Adj. Flow (vph)	216	228	85	61	291	54	126	121	46	26	87	179
Shared Lane Traffic (%)												
Lane Group Flow (vph)	216	228	85	61	291	54	126	167	0	26	87	179
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

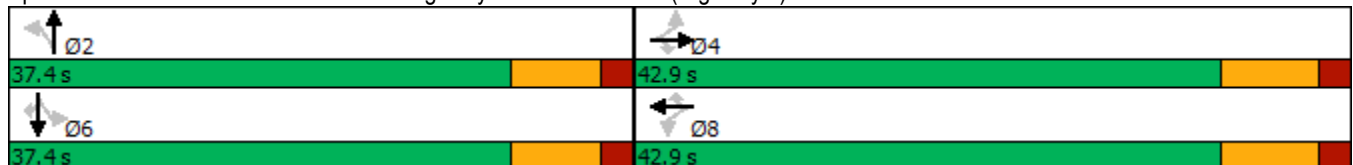


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	23.4	23.4	23.4	23.4	23.4	23.4	30.3	30.3		30.3	30.3	30.3
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.44	0.44		0.44	0.44	0.44
v/c Ratio	0.72	0.40	0.16	0.17	0.51	0.10	0.24	0.23		0.05	0.12	0.26
Control Delay	34.4	19.0	4.4	16.2	21.1	4.2	16.1	13.0		14.7	14.5	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	34.4	19.0	4.4	16.2	21.1	4.2	16.1	13.0		14.7	14.5	4.0
LOS	C	B	A	B	C	A	B	B		B	B	A
Approach Delay		22.9			18.1			14.3			8.1	
Approach LOS		C			B			B			A	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 69.2
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 17.1
 Intersection LOS: B
 Intersection Capacity Utilization 68.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2036 FB SAT

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	216	228	85	61	291	54	126	167	26	87	179
v/c Ratio	0.72	0.40	0.16	0.17	0.51	0.10	0.24	0.23	0.05	0.12	0.26
Control Delay	34.4	19.0	4.4	16.2	21.1	4.2	16.1	13.0	14.7	14.5	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	19.0	4.4	16.2	21.1	4.2	16.1	13.0	14.7	14.5	4.0
Queue Length 50th (m)	25.0	23.0	0.0	5.7	30.7	0.0	10.2	11.1	1.9	6.6	0.0
Queue Length 95th (m)	48.3	39.2	7.7	13.2	50.6	5.7	27.2	29.3	7.8	18.7	12.3
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	451	869	739	551	860	782	527	733	485	745	693
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	0.48	0.26	0.12	0.11	0.34	0.07	0.24	0.23	0.05	0.12	0.26

Intersection Summary

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2036 FB SAT
12/14/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	324	0	0	338	0	0	0	0	0	0	0
Future Volume (vph)	0	324	0	0	338	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	1699	0	0	1716	0	0	1716	0	0	1716	0
Flt Permitted												
Satd. Flow (perm)	0	1699	0	0	1716	0	0	1716	0	0	1716	0
Link Speed (k/h)		70			80			50			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			7.4			14.0	
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%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	352	0	0	367	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	352	0	0	367	0	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2036 FB SAT
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	324	0	0	338	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	324	0	0	338	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	352	0	0	367	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	367			352			719	719	352	719	719	367
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	367			352			719	719	352	719	719	367
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1192			1207			344	354	692	344	354	678
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	352	367	0	0								
Volume Left	0	0	0	0								
Volume Right	0	0	0	0								
cSH	1192	1207	1700	1700								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (m)	0.0	0.0	0.0	0.0								
Control Delay (s)	0.0	0.0	0.0	0.0								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	0.0	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.0									
Intersection Capacity Utilization			22.6%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2036 FB SAT
 12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (vph)	0	315	7	1	326	2	2	1	2	0	1	0
Future Volume (vph)	0	315	7	1	326	2	2	1	2	0	1	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.946				
Flt Protected								0.980				
Satd. Flow (prot)	0	1699	1473	0	1716	1458	0	1597	0	0	1716	0
Flt Permitted								0.980				
Satd. Flow (perm)	0	1699	1473	0	1716	1458	0	1597	0	0	1716	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	3%	1%	1%	2%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	0	342	8	1	354	2	2	1	2	0	1	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	342	8	0	355	2	0	5	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

















2036 FB SAT
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕↗			↕↗	
Traffic Volume (veh/h)	0	315	7	1	326	2	2	1	2	0	1	0
Future Volume (Veh/h)	0	315	7	1	326	2	2	1	2	0	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	342	8	1	354	2	2	1	2	0	1	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	356			350			698	700	342	700	706	354
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	356			350			698	700	342	700	706	354
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1203			1214			355	363	701	352	360	692
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	342	8	355	2	5	1						
Volume Left	0	0	1	0	2	0						
Volume Right	0	8	0	2	2	0						
cSH	1203	1700	1214	1700	445	360						
Volume to Capacity	0.00	0.00	0.00	0.00	0.01	0.00						
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	0.1						
Control Delay (s)	0.0	0.0	0.0	0.0	13.2	15.0						
Lane LOS			A		B	C						
Approach Delay (s)	0.0		0.0		13.2	15.0						
Approach LOS					B	C						
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			35.4%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2036 FB SAT
12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	114	8	6	86	1	3	2	9	4	7	3
Future Volume (vph)	0	114	8	6	86	1	3	2	9	4	7	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.991			0.999			0.910			0.973	
Fl _t Protected					0.997			0.990			0.987	
Satd. Flow (prot)	0	1717	0	0	1724	0	0	1551	0	0	1656	0
Fl _t Permitted					0.997			0.990			0.987	
Satd. Flow (perm)	0	1717	0	0	1724	0	0	1551	0	0	1656	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	1%	1%	2%	1%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	0	124	9	7	93	1	3	2	10	4	8	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	101	0	0	15	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2036 FB SAT
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	114	8	6	86	1	3	2	9	4	7	3
Future Volume (Veh/h)	0	114	8	6	86	1	3	2	9	4	7	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	124	9	7	93	1	3	2	10	4	8	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	94			133			243	236	128	247	240	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	94			133			243	236	128	247	240	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	99	99	100
cM capacity (veh/h)	1500			1452			702	663	921	695	659	963
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	101	15	15								
Volume Left	0	7	3	4								
Volume Right	9	1	10	3								
cSH	1500	1452	827	714								
Volume to Capacity	0.00	0.00	0.02	0.02								
Queue Length 95th (m)	0.0	0.1	0.4	0.5								
Control Delay (s)	0.0	0.6	9.4	10.1								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.6	9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			20.3%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2036 FB SAT
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	68	112	4	6	96	12	2	25	4	23	23	86
Future Volume (vph)	68	112	4	6	96	12	2	25	4	23	23	86
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.986			0.984			0.912	
Flt Protected		0.982			0.997			0.997			0.991	
Satd. Flow (prot)	0	1697	0	0	1703	0	0	1698	0	0	1553	0
Flt Permitted		0.982			0.997			0.997			0.991	
Satd. Flow (perm)	0	1697	0	0	1703	0	0	1698	0	0	1553	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)									3	3		
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 (%)	1%	1%	0%	1%	1%	1%	1%	1%	2%	1%	2%	2%
Adj. Flow (vph)	74	122	4	7	104	13	2	27	4	25	25	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	200	0	0	124	0	0	33	0	0	143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2036 FB SAT
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	68	112	4	6	96	12	2	25	4	23	23	86
Future Volume (Veh/h)	68	112	4	6	96	12	2	25	4	23	23	86
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	74	122	4	7	104	13	2	27	4	25	25	93
Pedestrians					3							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	117			126			502	403	127	417	398	110
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	117			126			502	403	127	417	398	110
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	95	100	95	95	90
cM capacity (veh/h)	1478			1467			400	508	921	501	510	943
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	200	124	33	143								
Volume Left	74	7	2	25								
Volume Right	4	13	4	93								
cSH	1478	1467	528	724								
Volume to Capacity	0.05	0.00	0.06	0.20								
Queue Length 95th (m)	1.3	0.1	1.6	5.9								
Control Delay (s)	3.1	0.5	12.3	11.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.1	0.5	12.3	11.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization			39.2%		ICU Level of Service				A			
Analysis Period (min)			15									

APPENDIX I

2041 Future Background Detailed Capacity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	216	113	74	295	94	69	113	38	46	102	196
Future Volume (vph)	171	216	113	74	295	94	69	113	38	46	102	196
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.98						
Frt			0.850			0.850		0.962				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1403	1630	1471	1390	1646	1607	0	1554	1716	1240
Flt Permitted	0.516			0.612			0.685			0.653		
Satd. Flow (perm)	812	1535	1403	1050	1471	1368	1187	1607	0	1068	1716	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			123			102		24				213
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
Confl. Peds. (#/hr)	4					4						
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 (%)	11%	14%	6%	2%	19%	7%	1%	6%	1%	7%	2%	20%
Adj. Flow (vph)	186	235	123	80	321	102	75	123	41	50	111	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	235	123	80	321	102	75	164	0	50	111	213
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

2041 FB AM
 12/14/2023

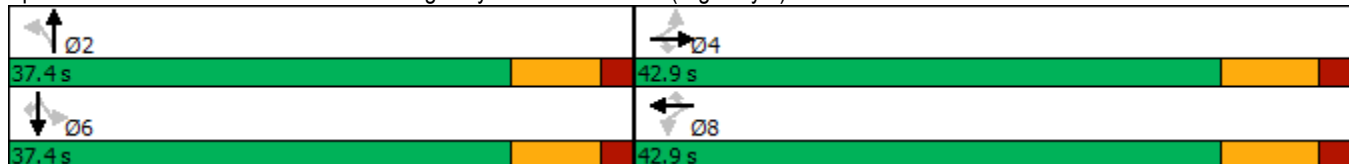


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	22.7	22.7	22.7	22.7	22.7	22.7	30.3	30.3		30.3	30.3	30.3
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.44	0.44		0.44	0.44	0.44
v/c Ratio	0.69	0.46	0.22	0.23	0.66	0.20	0.14	0.23		0.11	0.15	0.32
Control Delay	33.6	20.6	4.2	17.3	26.1	4.3	14.9	13.0		14.7	14.3	4.1
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	33.6	20.6	4.2	17.3	26.1	4.3	14.9	13.0		14.7	14.3	4.1
LOS	C	C	A	B	C	A	B	B		B	B	A
Approach Delay		21.3			20.3			13.6			8.6	
Approach LOS		C			C			B			A	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 68.5
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 17.0
 Intersection LOS: B
 Intersection Capacity Utilization 72.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2041 FB AM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	235	123	80	321	102	75	164	50	111	213
v/c Ratio	0.69	0.46	0.22	0.23	0.66	0.20	0.14	0.23	0.11	0.15	0.32
Control Delay	33.6	20.6	4.2	17.3	26.1	4.3	14.9	13.0	14.7	14.3	4.1
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	33.6	20.6	4.2	17.3	26.1	4.3	14.9	13.0	14.7	14.3	4.1
Queue Length 50th (m)	21.1	24.2	0.0	7.6	35.9	0.0	5.5	10.5	3.6	8.1	0.0
Queue Length 95th (m)	42.1	41.7	9.2	16.6	59.6	8.4	17.3	29.4	12.7	22.8	13.6
Internal Link Dist (m)	383.5			817.1			1020.5			134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0	25.0	
Base Capacity (vph)	419	792	783	542	759	755	525	724	472	759	667
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	0.44	0.30	0.16	0.15	0.42	0.14	0.14	0.23	0.11	0.15	0.32

Intersection Summary

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FB AM
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	301	0	0	436	0	0	0	0	0	0	2
Future Volume (vph)	1	301	0	0	436	0	0	0	0	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t												0.865
Fl _t Protected												
Satd. Flow (prot)	0	1447	0	0	1389	0	0	1716	0	0	1484	0
Fl _t Permitted												
Satd. Flow (perm)	0	1447	0	0	1389	0	0	1716	0	0	1484	0
Link Speed (k/h)	70		80				50			50		
Link Distance (m)	841.1				852.0			103.0			194.5	
Travel Time (s)	43.3		38.3				7.4			14.0		
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%	21%	2%	2%	26%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	327	0	0	474	0	0	0	0	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	328	0	0	474	0	0	0	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6		3.6				0.0			0.0		
Link Offset(m)	0.0				0.0			0.0			0.0	
Crosswalk Width(m)	4.8		4.8				4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15		25		15		25		15	
Sign Control	Free				Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2041 FB AM
 12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	301	0	0	436	0	0	0	0	0	0	2
Future Volume (Veh/h)	1	301	0	0	436	0	0	0	0	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	327	0	0	474	0	0	0	0	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	474			327			805	803	327	803	803	474
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	474			327			805	803	327	803	803	474
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1088			1233			300	317	714	301	317	590
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	328	474	0	2								
Volume Left	1	0	0	0								
Volume Right	0	0	0	2								
cSH	1088	1233	1700	590								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.0	0.0	0.0	0.1								
Control Delay (s)	0.0	0.0	0.0	11.1								
Lane LOS	A		A	B								
Approach Delay (s)	0.0	0.0	0.0	11.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.0									
Intersection Capacity Utilization			34.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FB AM
 12/14/2023






















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	1	291	7	2	409	0	12	0	2	0	2	2
Future Volume (vph)	1	291	7	2	409	0	12	0	2	0	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.982			0.932	
Flt Protected								0.958				
Satd. Flow (prot)	0	1459	1473	0	1412	1716	0	1628	0	0	1607	0
Flt Permitted								0.958				
Satd. Flow (perm)	0	1459	1473	0	1412	1716	0	1628	0	0	1607	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	20%	1%	1%	24%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	1	316	8	2	445	0	13	0	2	0	2	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	317	8	0	447	0	0	15	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.2%
ICU Level of Service	A
Analysis Period (min)	15

















HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FB AM
 12/14/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	1	291	7	2	409	0	12	0	2	0	2	2	
Future Volume (Veh/h)	1	291	7	2	409	0	12	0	2	0	2	2	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			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	
Hourly flow rate (vph)	1	316	8	2	445	0	13	0	2	0	2	2	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)													
Median type		None					None						
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	445			324			770	767	316	769	775	445	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	445			324			770	767	316	769	775	445	
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)													
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	100			100			96	100	100	100	99	100	
cM capacity (veh/h)	1115			1241			316	332	724	317	328	615	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	317	8	447	0	15	4							
Volume Left	1	0	2	0	13	0							
Volume Right	0	8	0	0	2	2							
cSH	1115	1700	1241	1700	341	428							
Volume to Capacity	0.00	0.00	0.00	0.00	0.04	0.01							
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.1	0.2							
Control Delay (s)	0.0	0.0	0.1	0.0	16.0	13.5							
Lane LOS	A		A		C	B							
Approach Delay (s)	0.0		0.1		16.0	13.5							
Approach LOS					C	B							
Intersection Summary													
Average Delay			0.4										
Intersection Capacity Utilization			40.2%		ICU Level of Service		A						
Analysis Period (min)			15										

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2041 FB AM
12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	91	6	7	86	2	5	5	4	2	4	1
Future Volume (vph)	1	91	6	7	86	2	5	5	4	2	4	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.991			0.997			0.961			0.981	
Fl _t Protected					0.996			0.982			0.986	
Satd. Flow (prot)	0	1656	0	0	1604	0	0	1625	0	0	1669	0
Fl _t Permitted					0.996			0.982			0.986	
Satd. Flow (perm)	0	1656	0	0	1604	0	0	1625	0	0	1669	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	5%	1%	2%	9%	2%	2%	1%	2%	2%	1%	2%
Adj. Flow (vph)	1	99	7	8	93	2	5	5	4	2	4	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	0	0	103	0	0	14	0	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2041 FB AM
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	91	6	7	86	2	5	5	4	2	4	1
Future Volume (Veh/h)	1	91	6	7	86	2	5	5	4	2	4	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	99	7	8	93	2	5	5	4	2	4	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	95			106			218	216	102	221	218	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			106			218	216	102	221	218	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	99	100	100	99	100
cM capacity (veh/h)	1499			1485			731	680	953	724	678	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	107	103	14	7								
Volume Left	1	8	5	2								
Volume Right	7	2	4	1								
cSH	1499	1485	761	722								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (m)	0.0	0.1	0.4	0.2								
Control Delay (s)	0.1	0.6	9.8	10.0								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.1	0.6	9.8	10.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			19.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2041 FB AM
12/14/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	75	109	6	3	114	44	3	25	9	34	18	67
Future Volume (vph)	75	109	6	3	114	44	3	25	9	34	18	67
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.963			0.966			0.924	
Flt Protected		0.981			0.999			0.996			0.986	
Satd. Flow (prot)	0	1600	0	0	1506	0	0	1663	0	0	1572	0
Flt Permitted		0.981			0.999			0.996			0.986	
Satd. Flow (perm)	0	1600	0	0	1506	0	0	1663	0	0	1572	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		1	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 (%)	4%	9%	2%	2%	15%	4%	1%	1%	2%	2%	2%	1%
Adj. Flow (vph)	82	118	7	3	124	48	3	27	10	37	20	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	0	0	175	0	0	40	0	0	130	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.1%
ICU Level of Service	A
Analysis Period (min)	15

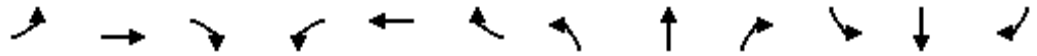
HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2041 FB AM
12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	109	6	3	114	44	3	25	9	34	18	67
Future Volume (Veh/h)	75	109	6	3	114	44	3	25	9	34	18	67
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	82	118	7	3	124	48	3	27	10	37	20	73
Pedestrians					1						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	173			125			522	464	122	465	444	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	173			125			522	464	122	465	444	149
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			99	94	99	92	96	92
cM capacity (veh/h)	1391			1462			395	466	928	457	477	900
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	207	175	40	130								
Volume Left	82	3	3	37								
Volume Right	7	48	10	73								
cSH	1391	1462	524	637								
Volume to Capacity	0.06	0.00	0.08	0.20								
Queue Length 95th (m)	1.5	0.0	2.0	6.1								
Control Delay (s)	3.4	0.1	12.4	12.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.4	0.1	12.4	12.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			45.1%		ICU Level of Service				A			
Analysis Period (min)			15									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	297	330	58	33	358	71	53	124	37	84	128	376
Future Volume (vph)	297	330	58	33	358	71	53	124	37	84	128	376
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.966				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1649	0	1614	1716	1352
Flt Permitted	0.462			0.494			0.668			0.647		
Satd. Flow (perm)	728	1535	1365	848	1683	1473	1146	1649	0	1099	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			63			75		21				343
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	323	359	63	36	389	77	58	135	40	91	139	409
Shared Lane Traffic (%)												
Lane Group Flow (vph)	323	359	63	36	389	77	58	175	0	91	139	409
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

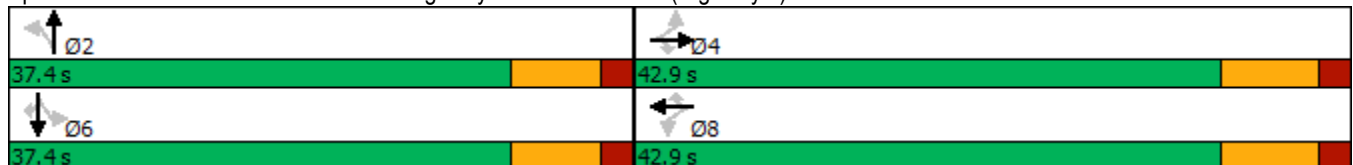


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44	0.44	0.37	0.37		0.37	0.37	0.37
v/c Ratio	1.02	0.54	0.10	0.10	0.53	0.11	0.14	0.28		0.22	0.22	0.57
Control Delay	81.9	20.4	4.3	14.3	19.9	4.2	17.8	16.9		19.0	18.3	7.4
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	81.9	20.4	4.3	14.3	19.9	4.2	17.8	16.9		19.0	18.3	7.4
LOS	F	C	A	B	B	A	B	B		B	B	A
Approach Delay		45.7			17.1			17.1			11.5	
Approach LOS		D			B			B			B	

Intersection Summary

Area Type:	Other
Cycle Length:	80.3
Actuated Cycle Length:	80.3
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.02
Intersection Signal Delay:	25.5
Intersection LOS:	C
Intersection Capacity Utilization:	81.7%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	323	359	63	36	389	77	58	175	91	139	409
v/c Ratio	1.02	0.54	0.10	0.10	0.53	0.11	0.14	0.28	0.22	0.22	0.57
Control Delay	81.9	20.4	4.3	14.3	19.9	4.2	17.8	16.9	19.0	18.3	7.4
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	81.9	20.4	4.3	14.3	19.9	4.2	17.8	16.9	19.0	18.3	7.4
Queue Length 50th (m)	~52.4	41.0	0.0	3.3	44.2	0.2	6.0	16.7	9.8	14.9	6.8
Queue Length 95th (m)	#105.3	66.9	6.6	9.0	70.4	7.6	14.2	31.7	20.6	27.7	30.6
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	317	669	630	369	733	684	428	629	410	641	719
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	1.02	0.54	0.10	0.10	0.53	0.11	0.14	0.28	0.22	0.22	0.57

Intersection Summary

~ 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.

Lanes, Volumes, Timings
 2: Snider Road & Main St. E. (Highway 3)

2041 FB PM
 12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Volume (vph)	1	448	0	1	428	0	1	1	0	0	0	1	
Future Volume (vph)	1	448	0	1	428	0	1	1	0	0	0	1	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt												0.865	
Flt Protected									0.976				
Satd. Flow (prot)	0	1535	0	0	1667	0	0	1675	0	0	1484	0	
Flt Permitted									0.976				
Satd. Flow (perm)	0	1535	0	0	1667	0	0	1675	0	0	1484	0	
Link Speed (k/h)	70				80				50		50		
Link Distance (m)	841.1				852.0				103.0		194.5		
Travel Time (s)	43.3				38.3				7.4		14.0		
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%	
Adj. Flow (vph)	1	487	0	1	465	0	1	1	0	0	0	1	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	488	0	0	466	0	0	2	0	0	1	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	3.6				3.6				0.0		0.0		
Link Offset(m)	0.0				0.0				0.0		0.0		
Crosswalk Width(m)	4.8				4.8				4.8		4.8		
Two way Left Turn Lane													
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	
Turning Speed (k/h)	25		15		25		15		25		15		
Sign Control	Free				Free				Stop		Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2041 FB PM
 12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	448	0	1	428	0	1	1	0	0	0	1
Future Volume (Veh/h)	1	448	0	1	428	0	1	1	0	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	487	0	1	465	0	1	1	0	0	0	1
Pedestrians												1
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												0
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	466			487			957	957	487	958	957	466
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	466			487			957	957	487	958	957	466
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1095			1076			236	257	581	236	257	596
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	488	466	2	1								
Volume Left	1	1	1	0								
Volume Right	0	0	0	1								
cSH	1095	1076	246	596								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (m)	0.0	0.0	0.2	0.0								
Control Delay (s)	0.0	0.0	19.7	11.0								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.0	0.0	19.7	11.0								
Approach LOS			C	B								
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			36.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FB PM
 12/14/2023























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (vph)	0	423	16	0	406	0	9	0	3	0	0	2
Future Volume (vph)	0	423	16	0	406	0	9	0	3	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.969			0.865	
Flt Protected								0.963				
Satd. Flow (prot)	0	1549	1473	0	1667	1716	0	1613	0	0	1499	0
Flt Permitted								0.963				
Satd. Flow (perm)	0	1549	1473	0	1667	1716	0	1613	0	0	1499	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	13%	1%	1%	5%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	0	460	17	0	441	0	10	0	3	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	460	17	0	441	0	0	13	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.9%
ICU Level of Service	A
Analysis Period (min)	15

















HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FB PM
 12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	423	16	0	406	0	9	0	3	0	0	2
Future Volume (Veh/h)	0	423	16	0	406	0	9	0	3	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	460	17	0	441	0	10	0	3	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	441			477			903	901	460	904	918	441
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	441			477			903	901	460	904	918	441
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	100	100	100	100
cM capacity (veh/h)	1119			1090			258	278	601	257	272	618
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	460	17	441	0	13	2						
Volume Left	0	0	0	0	10	0						
Volume Right	0	17	0	0	3	2						
cSH	1119	1700	1090	1700	298	618						
Volume to Capacity	0.00	0.01	0.00	0.00	0.04	0.00						
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.1	0.1						
Control Delay (s)	0.0	0.0	0.0	0.0	17.6	10.8						
Lane LOS					C	B						
Approach Delay (s)	0.0		0.0		17.6	10.8						
Approach LOS					C	B						
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			39.9%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2041 FB PM
12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	141	6	6	103	2	7	4	8	2	10	2
Future Volume (vph)	4	141	6	6	103	2	7	4	8	2	10	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.998			0.942			0.982	
Flt Protected		0.999			0.997			0.981			0.993	
Satd. Flow (prot)	0	1720	0	0	1619	0	0	1594	0	0	1685	0
Flt Permitted		0.999			0.997			0.981			0.993	
Satd. Flow (perm)	0	1720	0	0	1619	0	0	1594	0	0	1685	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	1%	1%	2%	8%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	4	153	7	7	112	2	8	4	9	2	11	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	0	121	0	0	21	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2041 FB PM
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	4	141	6	6	103	2	7	4	8	2	10	2
Future Volume (Veh/h)	4	141	6	6	103	2	7	4	8	2	10	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	4	153	7	7	112	2	8	4	9	2	11	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	114			160			299	292	156	302	295	113
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			160			299	292	156	302	295	113
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	99	100	98	100
cM capacity (veh/h)	1475			1419			641	615	889	636	613	940
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	164	121	21	15								
Volume Left	4	7	8	2								
Volume Right	7	2	9	2								
cSH	1475	1419	722	646								
Volume to Capacity	0.00	0.00	0.03	0.02								
Queue Length 95th (m)	0.1	0.1	0.7	0.6								
Control Delay (s)	0.2	0.5	10.1	10.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	10.1	10.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			19.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2041 FB PM
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	88	153	4	7	110	19	5	20	3	37	25	83
Future Volume (vph)	88	153	4	7	110	19	5	20	3	37	25	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.981			0.986			0.923	
Flt Protected		0.982			0.997			0.992			0.987	
Satd. Flow (prot)	0	1686	0	0	1630	0	0	1693	0	0	1571	0
Flt Permitted		0.982			0.997			0.992			0.987	
Satd. Flow (perm)	0	1686	0	0	1630	0	0	1693	0	0	1571	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)	1					1			3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	96	166	4	8	120	21	5	22	3	40	27	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	266	0	0	149	0	0	30	0	0	157	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

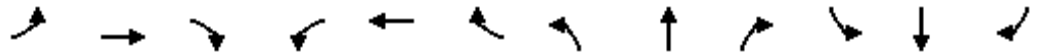
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2041 FB PM
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	88	153	4	7	110	19	5	20	3	37	25	83
Future Volume (Veh/h)	88	153	4	7	110	19	5	20	3	37	25	83
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	96	166	4	8	120	21	5	22	3	40	27	90
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	142			170			610	518	171	524	510	132
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	142			170			610	518	171	524	510	132
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			98	95	100	90	94	90
cM capacity (veh/h)	1434			1413			331	429	871	421	433	917
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	266	149	30	157								
Volume Left	96	8	5	40								
Volume Right	4	21	3	90								
cSH	1434	1413	430	614								
Volume to Capacity	0.07	0.01	0.07	0.26								
Queue Length 95th (m)	1.7	0.1	1.8	8.1								
Control Delay (s)	3.1	0.5	14.0	12.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.1	0.5	14.0	12.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			46.6%		ICU Level of Service				A			
Analysis Period (min)			15									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	238	88	63	303	57	116	111	42	26	87	179
Future Volume (vph)	225	238	88	63	303	57	116	111	42	26	87	179
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.959				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1699	1365	1662	1683	1473	1630	1638	0	1614	1699	1352
Flt Permitted	0.513			0.599			0.695			0.651		
Satd. Flow (perm)	809	1699	1365	1048	1683	1473	1192	1638	0	1106	1699	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			96			62		27				195
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	3%	9%	0%	4%	1%	2%	3%	1%	3%	3%	10%
Adj. Flow (vph)	245	259	96	68	329	62	126	121	46	28	95	195
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	259	96	68	329	62	126	167	0	28	95	195
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

2041 FB SAT
 12/14/2023

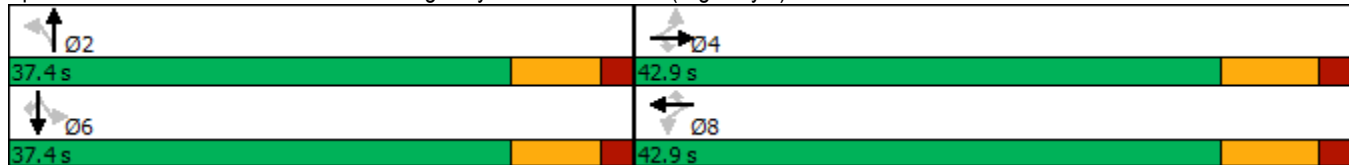


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	26.5	26.5	26.5	26.5	26.5	26.5	30.4	30.4		30.4	30.4	30.4
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.42	0.42		0.42	0.42	0.42
v/c Ratio	0.83	0.42	0.17	0.18	0.53	0.11	0.25	0.24		0.06	0.13	0.29
Control Delay	44.2	18.6	4.1	15.7	20.9	4.4	17.9	14.4		16.0	16.2	4.1
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	44.2	18.6	4.1	15.7	20.9	4.4	17.9	14.4		16.0	16.2	4.1
LOS	D	B	A	B	C	A	B	B		B	B	A
Approach Delay		26.8			17.9			15.9			8.8	
Approach LOS		C			B			B			A	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 72.4
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 19.0
 Intersection Capacity Utilization 73.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	245	259	96	68	329	62	126	167	28	95	195
v/c Ratio	0.83	0.42	0.17	0.18	0.53	0.11	0.25	0.24	0.06	0.13	0.29
Control Delay	44.2	18.6	4.1	15.7	20.9	4.4	17.9	14.4	16.0	16.2	4.1
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	44.2	18.6	4.1	15.7	20.9	4.4	17.9	14.4	16.0	16.2	4.1
Queue Length 50th (m)	30.7	26.7	0.0	6.4	35.7	0.0	11.9	12.9	2.4	8.5	0.0
Queue Length 95th (m)	#67.4	44.5	8.2	14.5	58.0	6.6	27.3	29.3	8.2	20.1	12.9
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	396	831	717	513	824	753	500	702	464	712	680
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	0.62	0.31	0.13	0.13	0.40	0.08	0.25	0.24	0.06	0.13	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FB SAT
12/14/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	367	0	0	383	0	0	0	0	0	0	0
Future Volume (vph)	0	367	0	0	383	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	1699	0	0	1716	0	0	1716	0	0	1716	0
Flt Permitted												
Satd. Flow (perm)	0	1699	0	0	1716	0	0	1716	0	0	1716	0
Link Speed (k/h)		70			80			50			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			7.4			14.0	
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%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	399	0	0	416	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	399	0	0	416	0	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	25.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2041 FB SAT
 12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	367	0	0	383	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	367	0	0	383	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	399	0	0	416	0	0	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	416			399			815	815	399	815	815	416
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	416			399			815	815	399	815	815	416
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1143			1160			296	312	651	296	312	637
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	399	416	0	0								
Volume Left	0	0	0	0								
Volume Right	0	0	0	0								
cSH	1143	1160	1700	1700								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (m)	0.0	0.0	0.0	0.0								
Control Delay (s)	0.0	0.0	0.0	0.0								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	0.0	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.0									
Intersection Capacity Utilization			25.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FB SAT
 12/14/2023





















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (vph)	0	356	7	1	369	2	2	1	2	0	1	0
Future Volume (vph)	0	356	7	1	369	2	2	1	2	0	1	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.946				
Flt Protected								0.980				
Satd. Flow (prot)	0	1699	1473	0	1716	1458	0	1597	0	0	1716	0
Flt Permitted								0.980				
Satd. Flow (perm)	0	1699	1473	0	1716	1458	0	1597	0	0	1716	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	3%	1%	1%	2%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	0	387	8	1	401	2	2	1	2	0	1	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	387	8	0	402	2	0	5	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.8%
ICU Level of Service	A
Analysis Period (min)	15

















HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FB SAT
 12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	356	7	1	369	2	2	1	2	0	1	0
Future Volume (Veh/h)	0	356	7	1	369	2	2	1	2	0	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	387	8	1	401	2	2	1	2	0	1	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None					None					
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	403			395			790	792	387	792	798	401
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	403			395			790	792	387	792	798	401
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1156			1169			308	321	661	305	319	651
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	387	8	402	2	5	1						
Volume Left	0	0	1	0	2	0						
Volume Right	0	8	0	2	2	0						
cSH	1156	1700	1169	1700	396	319						
Volume to Capacity	0.00	0.00	0.00	0.00	0.01	0.00						
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	0.1						
Control Delay (s)	0.0	0.0	0.0	0.0	14.2	16.3						
Lane LOS			A		B	C						
Approach Delay (s)	0.0		0.0		14.2	16.3						
Approach LOS					B	C						
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			37.8%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2041 FB SAT
12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	114	8	6	86	1	3	2	9	4	7	3
Future Volume (vph)	0	114	8	6	86	1	3	2	9	4	7	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991			0.999			0.910			0.973	
Flt Protected					0.997			0.990			0.987	
Satd. Flow (prot)	0	1717	0	0	1724	0	0	1551	0	0	1656	0
Flt Permitted					0.997			0.990			0.987	
Satd. Flow (perm)	0	1717	0	0	1724	0	0	1551	0	0	1656	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		840.4			560.6			68.7			892.0	
Travel Time (s)		50.4			33.6			4.9			53.5	
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%	1%	1%	2%	1%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	0	124	9	7	93	1	3	2	10	4	8	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	101	0	0	15	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2041 FB SAT
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	114	8	6	86	1	3	2	9	4	7	3
Future Volume (Veh/h)	0	114	8	6	86	1	3	2	9	4	7	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	124	9	7	93	1	3	2	10	4	8	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	94			133			243	236	128	247	240	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	94			133			243	236	128	247	240	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	99	99	100
cM capacity (veh/h)	1500			1452			702	663	921	695	659	963
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	101	15	15								
Volume Left	0	7	3	4								
Volume Right	9	1	10	3								
cSH	1500	1452	827	714								
Volume to Capacity	0.00	0.00	0.02	0.02								
Queue Length 95th (m)	0.0	0.1	0.4	0.5								
Control Delay (s)	0.0	0.6	9.4	10.1								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.6	9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			20.3%	ICU Level of Service		A						
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2041 FB SAT
12/14/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	68	112	4	6	96	12	2	25	4	23	23	86
Future Volume (vph)	68	112	4	6	96	12	2	25	4	23	23	86
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.986			0.984			0.912	
Flt Protected		0.982			0.997			0.997			0.991	
Satd. Flow (prot)	0	1697	0	0	1703	0	0	1698	0	0	1553	0
Flt Permitted		0.982			0.997			0.997			0.991	
Satd. Flow (perm)	0	1697	0	0	1703	0	0	1698	0	0	1553	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			822.5			155.4			1044.5	
Travel Time (s)		14.5			59.2			11.2			94.0	
Confl. Peds. (#/hr)									3	3		
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 (%)	1%	1%	0%	1%	1%	1%	1%	1%	2%	1%	2%	2%
Adj. Flow (vph)	74	122	4	7	104	13	2	27	4	25	25	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	200	0	0	124	0	0	33	0	0	143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2041 FB SAT
12/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	68	112	4	6	96	12	2	25	4	23	23	86
Future Volume (Veh/h)	68	112	4	6	96	12	2	25	4	23	23	86
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	74	122	4	7	104	13	2	27	4	25	25	93
Pedestrians					3							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	117			126			502	403	127	417	398	110
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	117			126			502	403	127	417	398	110
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	95	100	95	95	90
cM capacity (veh/h)	1478			1467			400	508	921	501	510	943
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	200	124	33	143								
Volume Left	74	7	2	25								
Volume Right	4	13	4	93								
cSH	1478	1467	528	724								
Volume to Capacity	0.05	0.00	0.06	0.20								
Queue Length 95th (m)	1.3	0.1	1.6	5.9								
Control Delay (s)	3.1	0.5	12.3	11.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.1	0.5	12.3	11.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization			39.2%		ICU Level of Service				A			
Analysis Period (min)			15									

APPENDIX J

2041 Future Background Optimized Detailed Capacity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	297	330	58	33	358	71	53	124	37	84	128	376
Future Volume (vph)	297	330	58	33	358	71	53	124	37	84	128	376
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.966				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1649	0	1614	1716	1352
Flt Permitted	0.298			0.547			0.668			0.647		
Satd. Flow (perm)	470	1535	1365	938	1683	1473	1146	1649	0	1099	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			63			116		19				409
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	323	359	63	36	389	77	58	135	40	91	139	409
Shared Lane Traffic (%)												
Lane Group Flow (vph)	323	359	63	36	389	77	58	175	0	91	139	409
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	7	4			8			2				6

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

2024 FB PM Optimized
 12/14/2023

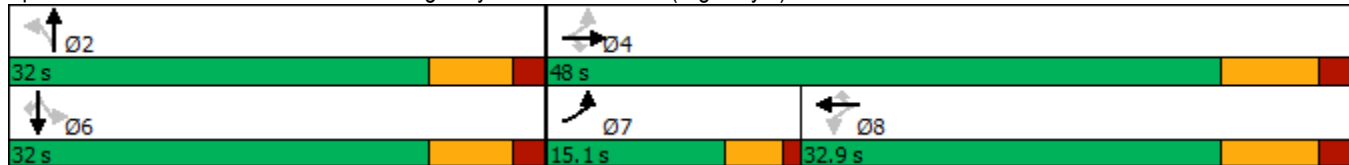


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	7	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	9.5	32.9	32.9	32.9	32.9	32.9	32.0	32.0		32.0	32.0	32.0
Total Split (s)	15.1	48.0	48.0	32.9	32.9	32.9	32.0	32.0		32.0	32.0	32.0
Total Split (%)	18.9%	60.0%	60.0%	41.1%	41.1%	41.1%	40.0%	40.0%		40.0%	40.0%	40.0%
Maximum Green (s)	10.6	40.1	40.1	25.0	25.0	25.0	25.0	25.0		25.0	25.0	25.0
Yellow Time (s)	3.5	5.9	5.9	5.9	5.9	5.9	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	1.0	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		0.0	0.0	0.0
Total Lost Time (s)	4.5	7.9	7.9	7.9	7.9	7.9	7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	40.8	37.4	37.4	22.3	22.3	22.3	25.1	25.1		25.1	25.1	25.1
Actuated g/C Ratio	0.53	0.48	0.48	0.29	0.29	0.29	0.32	0.32		0.32	0.32	0.32
v/c Ratio	0.83	0.48	0.09	0.13	0.81	0.15	0.16	0.32		0.26	0.25	0.57
Control Delay	32.6	16.0	3.4	21.4	39.6	2.5	21.2	20.3		22.8	21.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	32.6	16.0	3.4	21.4	39.6	2.5	21.2	20.3		22.8	21.7	6.0
LOS	C	B	A	C	D	A	C	C		C	C	A
Approach Delay		22.1			32.6			20.5			11.8	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 77.4
 Natural Cycle: 80
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 21.3
 Intersection LOS: C
 Intersection Capacity Utilization 78.2%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	323	359	63	36	389	77	58	175	91	139	409
v/c Ratio	0.83	0.48	0.09	0.13	0.81	0.15	0.16	0.32	0.26	0.25	0.57
Control Delay	32.6	16.0	3.4	21.4	39.6	2.5	21.2	20.3	22.8	21.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	16.0	3.4	21.4	39.6	2.5	21.2	20.3	22.8	21.7	6.0
Queue Length 50th (m)	28.0	35.3	0.0	4.1	55.1	0.0	6.7	18.8	10.8	16.5	0.0
Queue Length 95th (m)	#63.0	57.7	5.8	11.1	#95.7	4.6	15.7	35.4	22.8	30.7	20.8
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	388	797	739	303	544	555	371	546	355	555	714
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	0.83	0.45	0.09	0.12	0.72	0.14	0.16	0.32	0.26	0.25	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

APPENDIX K

ITE Excerpts

Single-Family Detached Housing (210)

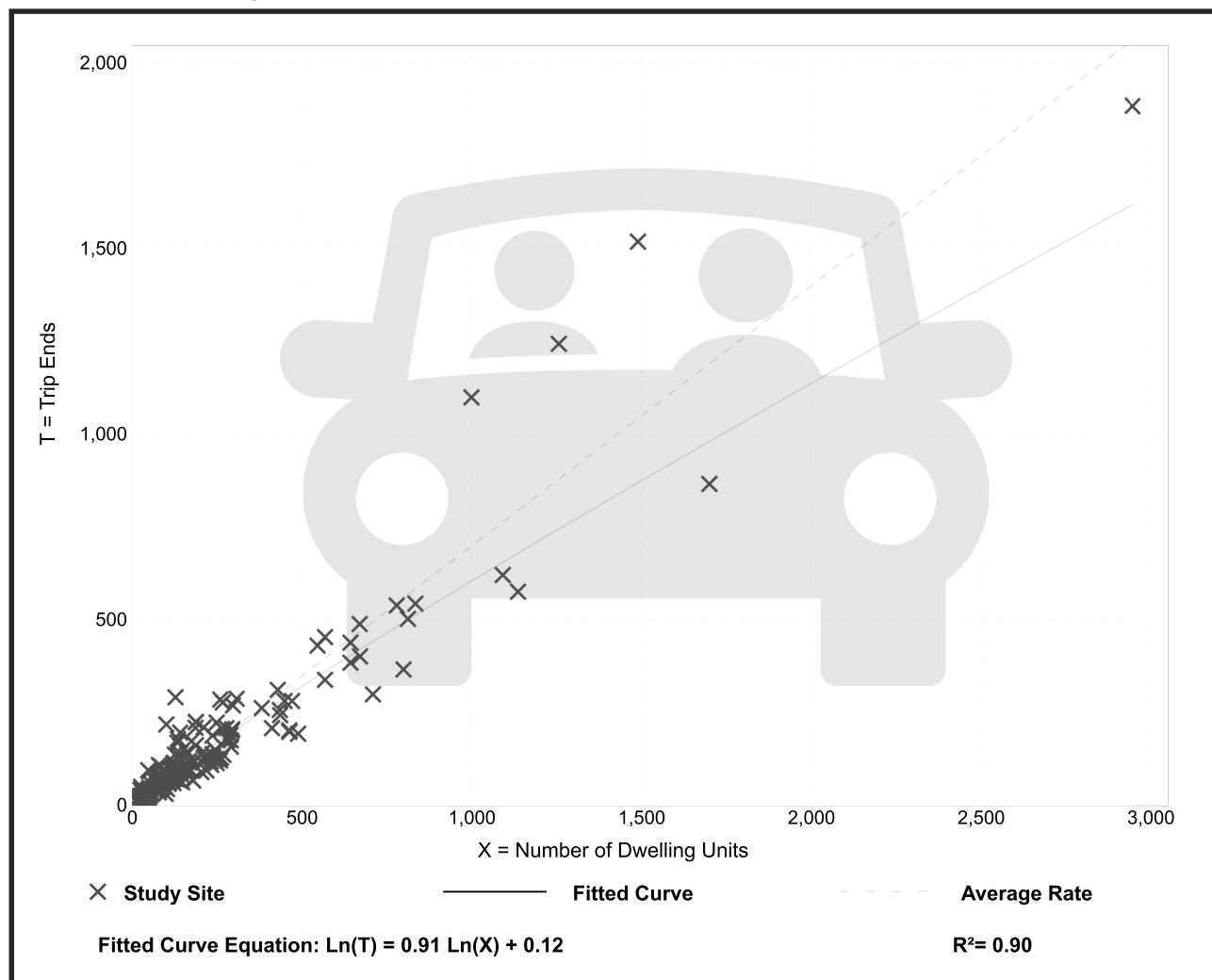
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban
 Number of Studies: 192
 Avg. Num. of Dwelling Units: 226
 Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



Single-Family Detached Housing (210)

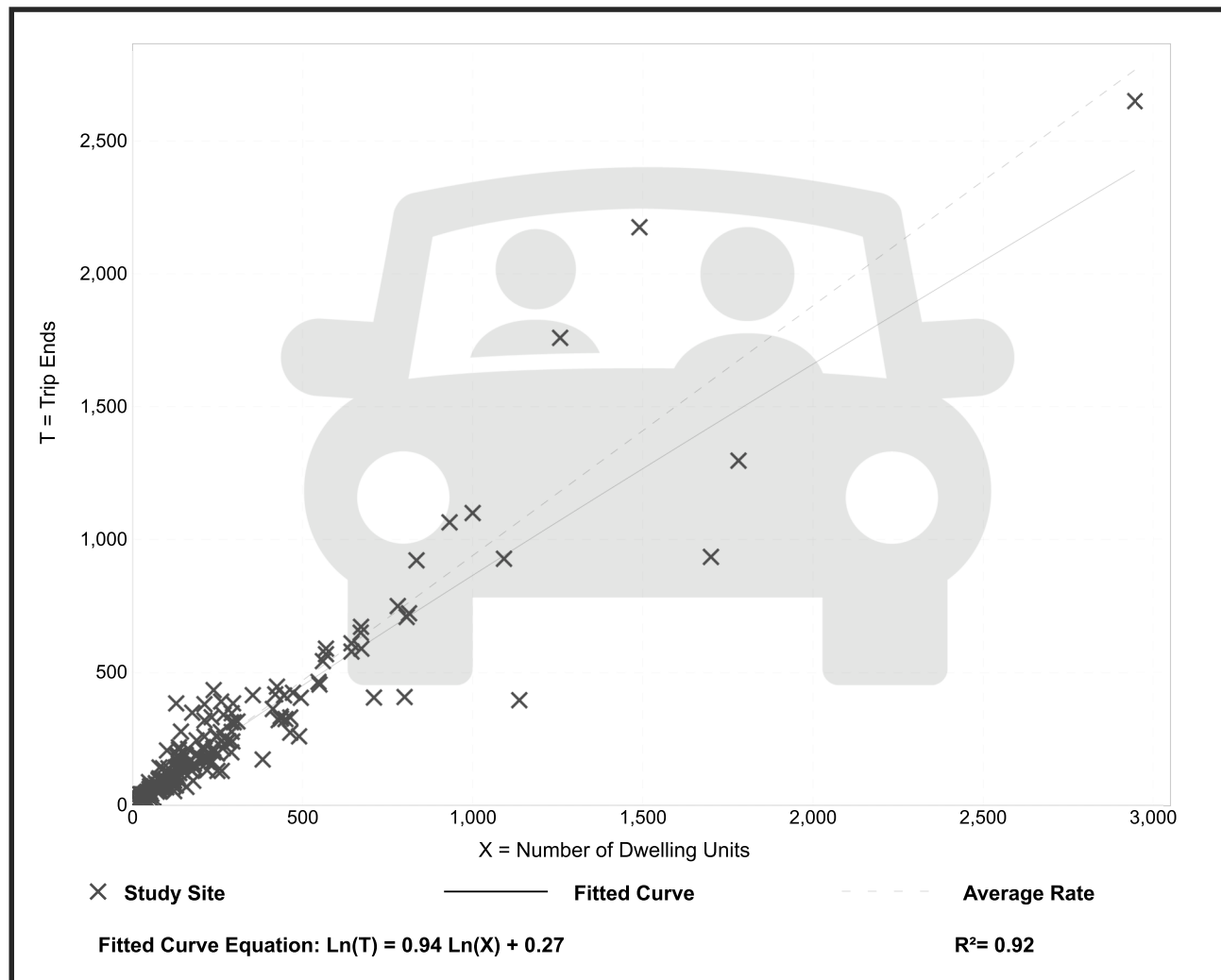
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban
 Number of Studies: 208
 Avg. Num. of Dwelling Units: 248
 Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Single-Family Detached Housing (210)

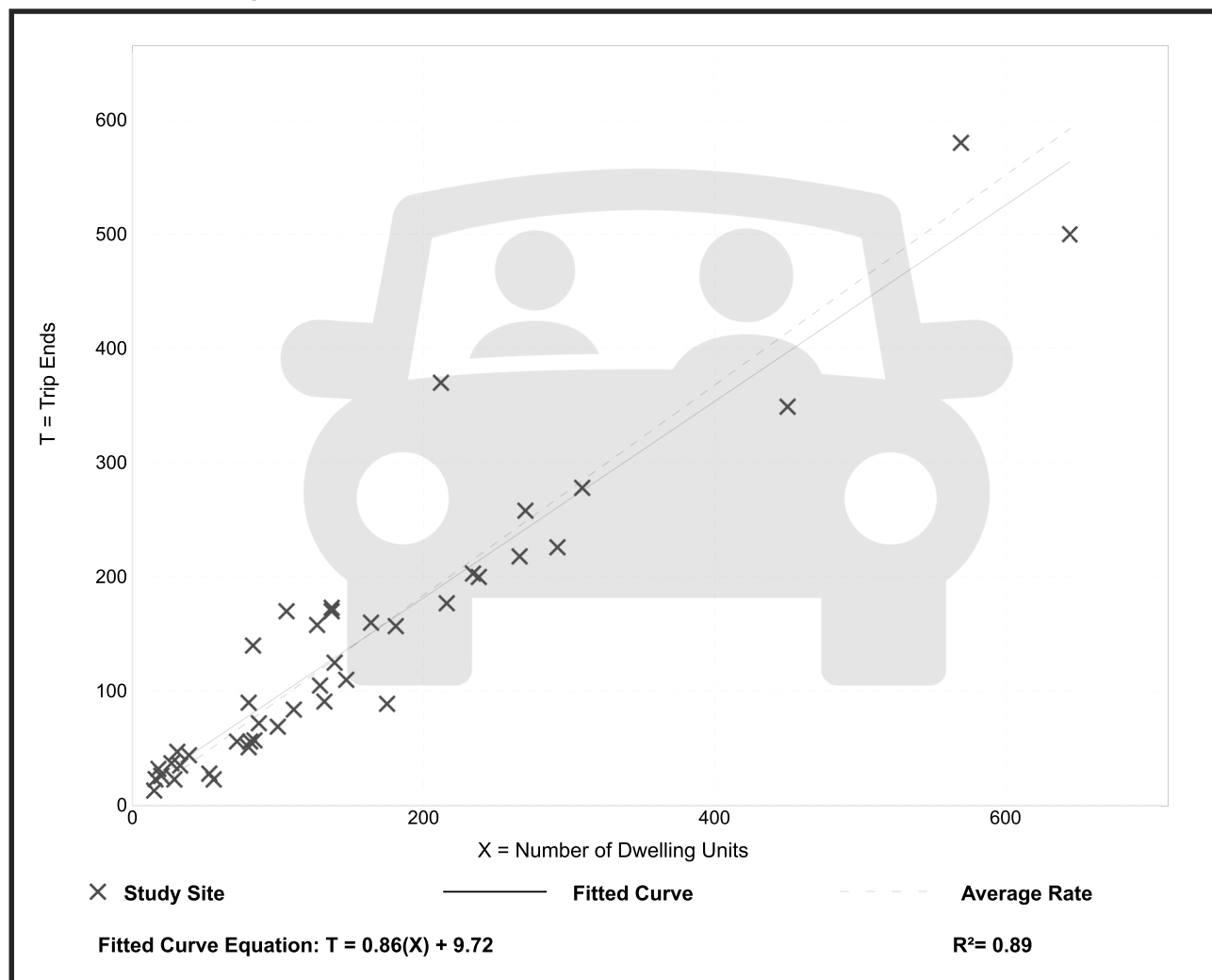
Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
 Number of Studies: 42
 Avg. Num. of Dwelling Units: 152
 Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.92	0.41 - 1.78	0.27

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

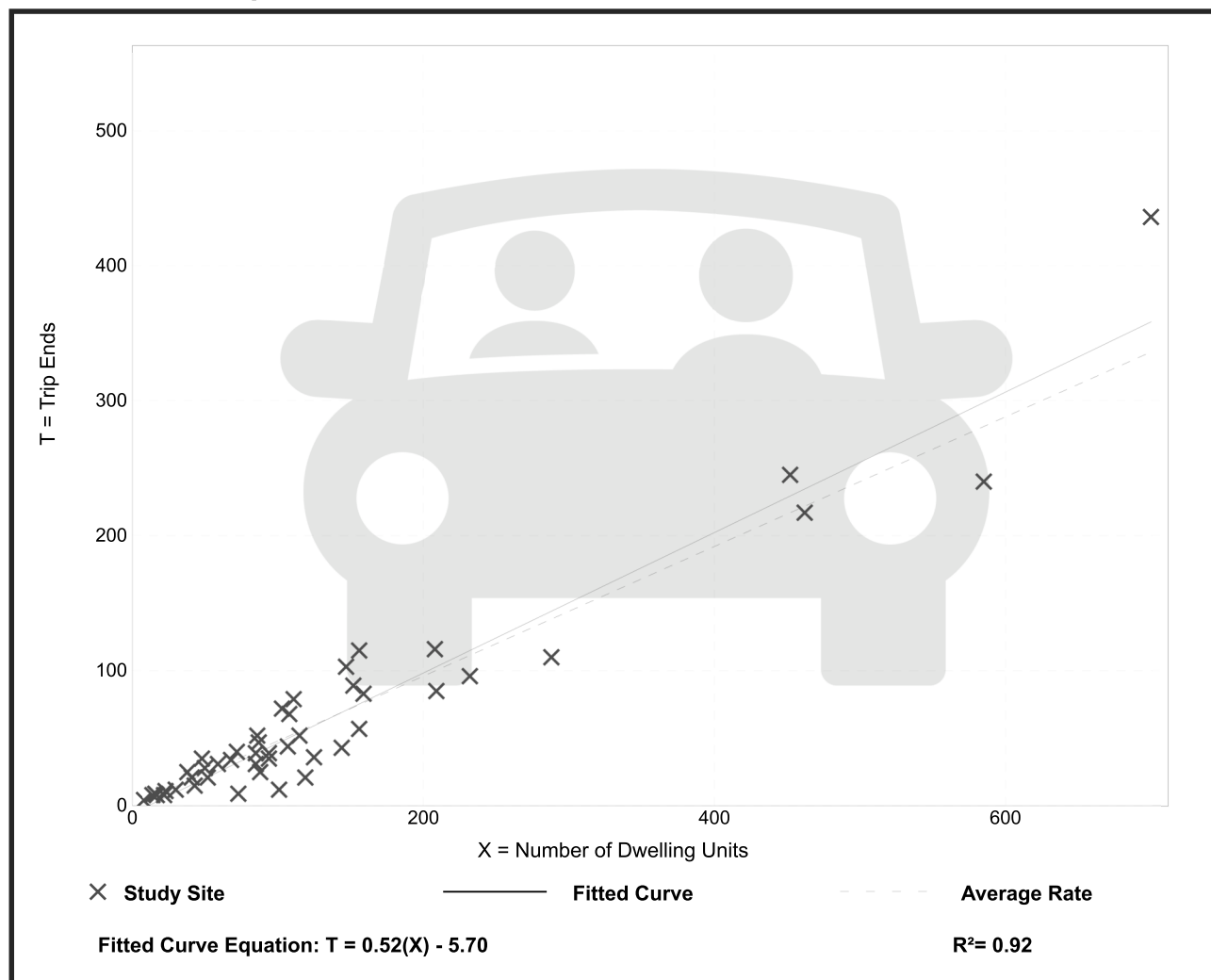
Setting/Location: General Urban/Suburban

Number of Studies: 46
 Avg. Num. of Dwelling Units: 135
 Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



Single-Family Attached Housing (215)

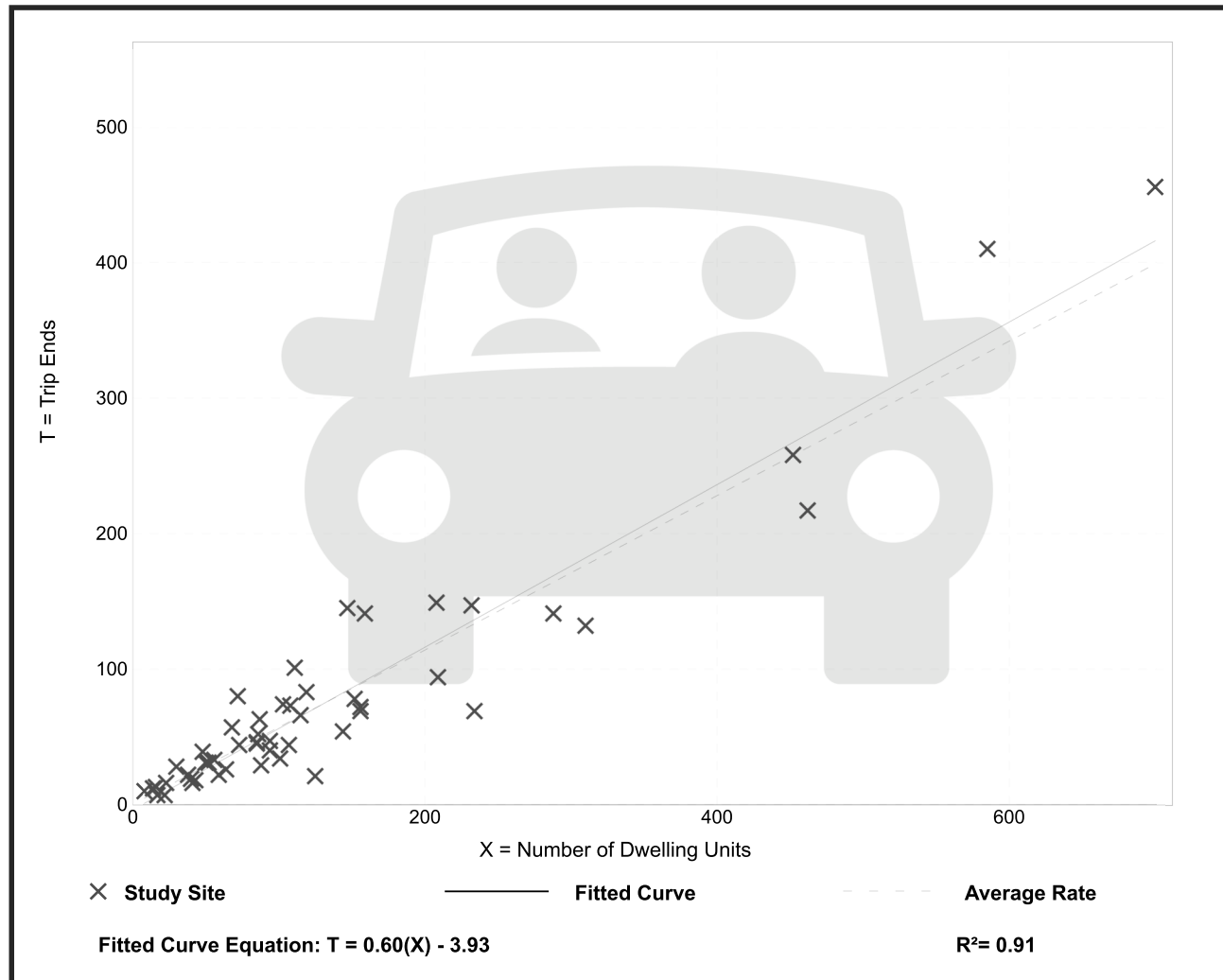
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban
 Number of Studies: 51
 Avg. Num. of Dwelling Units: 136
 Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



Single-Family Attached Housing (215)

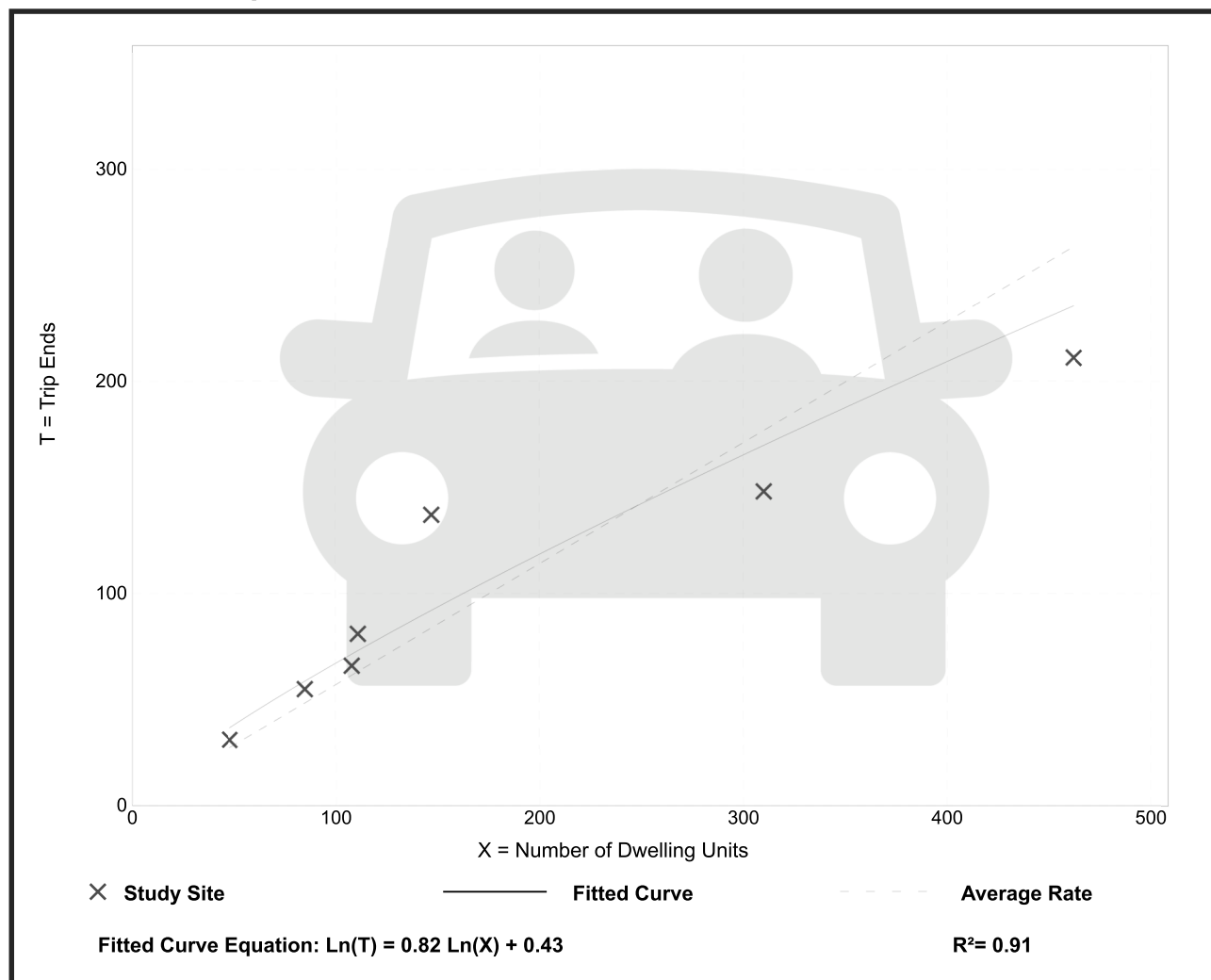
Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
 Number of Studies: 7
 Avg. Num. of Dwelling Units: 182
 Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.46 - 0.93	0.17

Data Plot and Equation



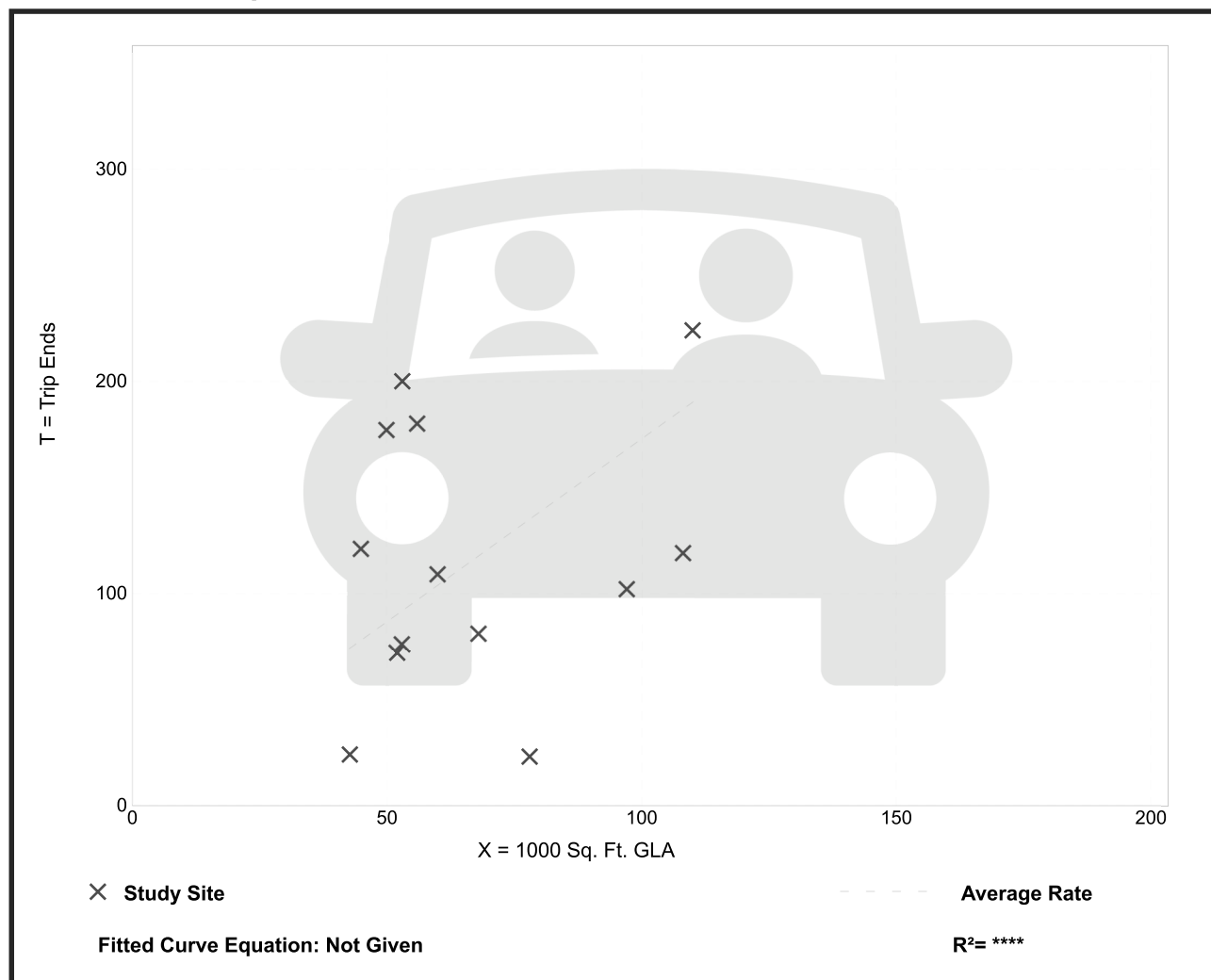
Shopping Plaza (40-150k) - Supermarket - No (821)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 13
 Avg. 1000 Sq. Ft. GLA: 67
 Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
1.73	0.29 - 3.77	1.06

Data Plot and Equation



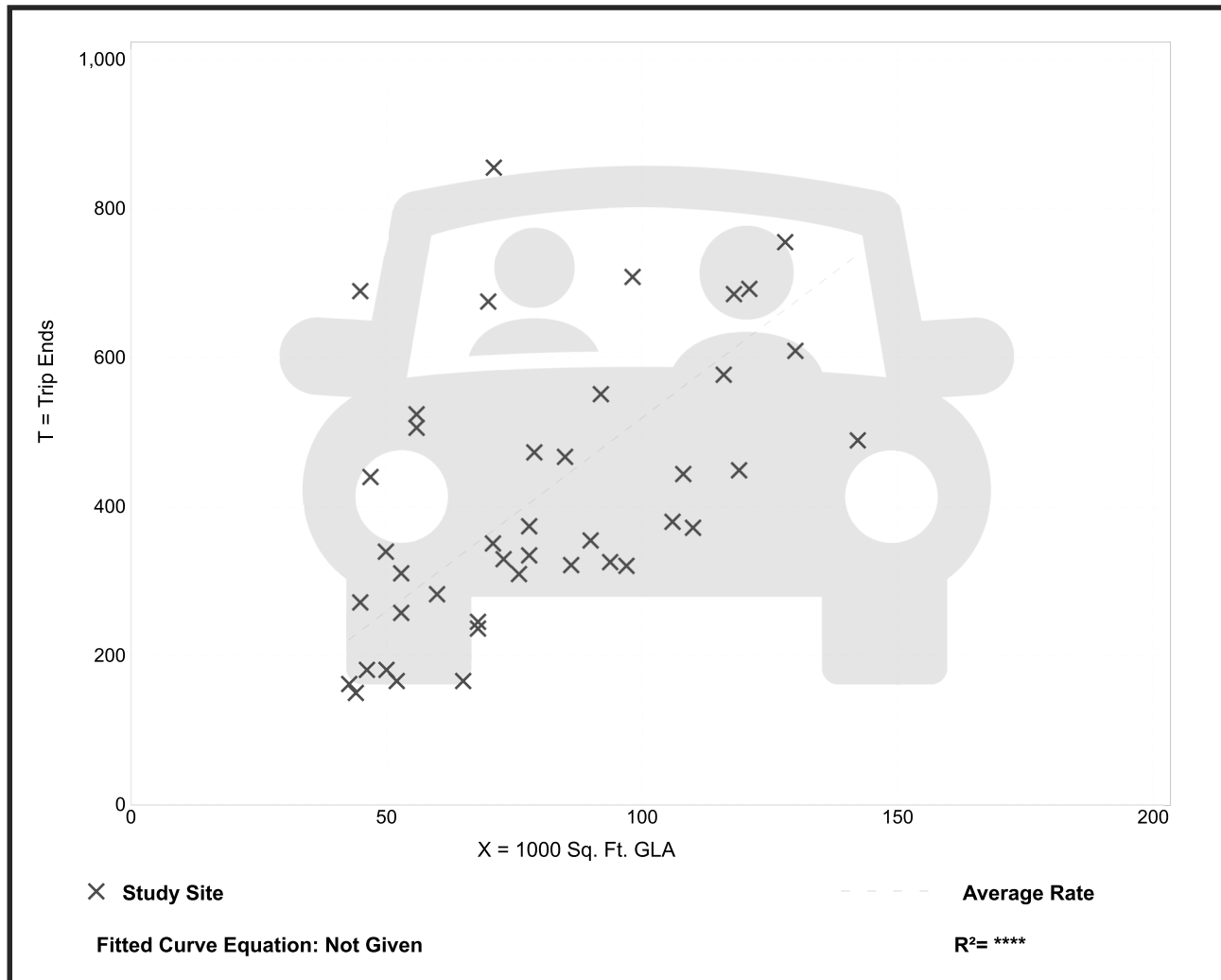
Shopping Plaza (40-150k) - Supermarket - No (821)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 42
 Avg. 1000 Sq. Ft. GLA: 79
 Directional Distribution: 49% entering, 51% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
5.19	2.55 - 15.31	2.28

Data Plot and Equation



Shopping Plaza (40-150k) - Supermarket - No (821)

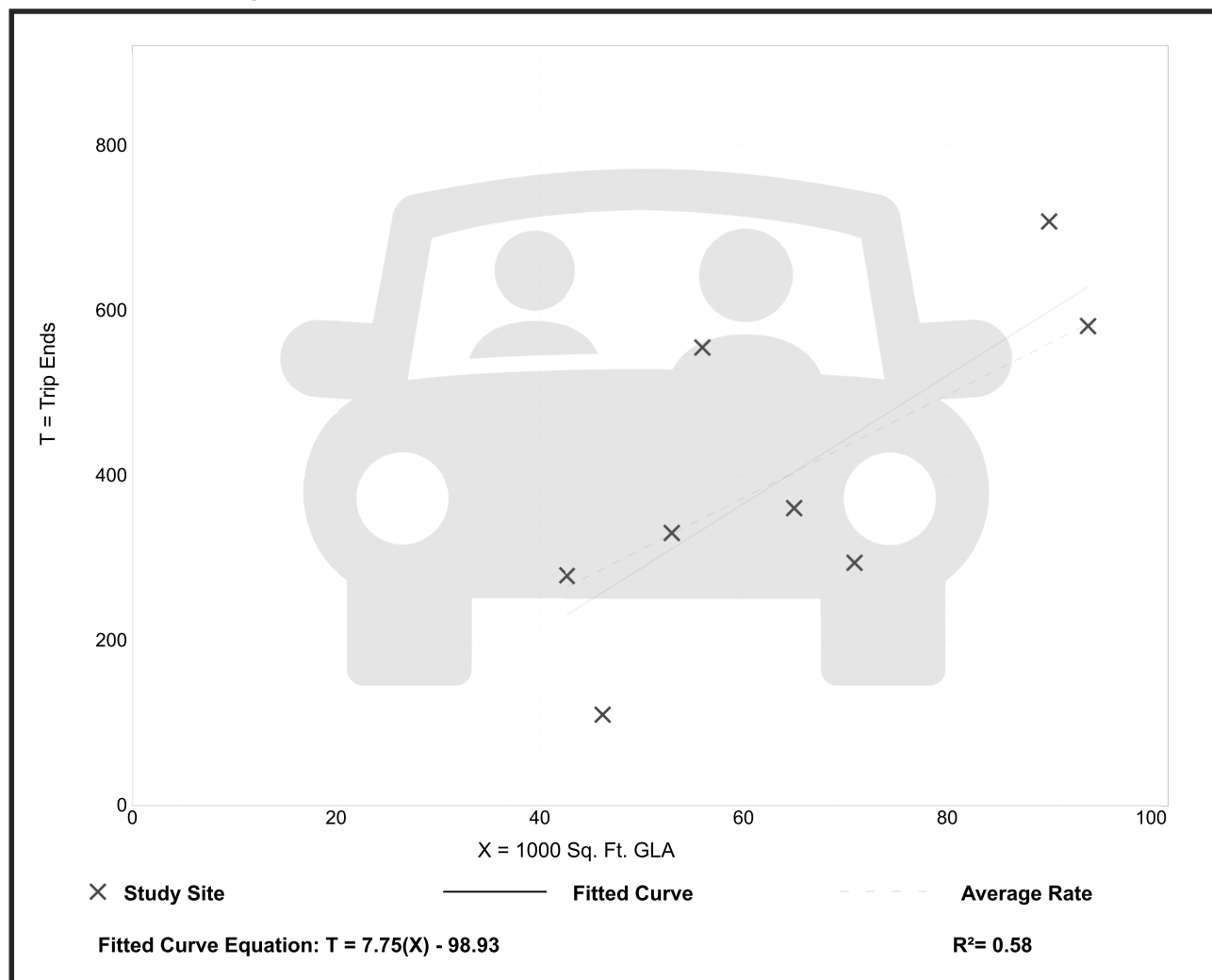
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 8
Avg. 1000 Sq. Ft. GLA: 65
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.22	2.38 - 9.91	2.11

Data Plot and Equation



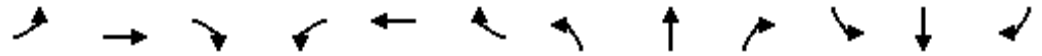
APPENDIX L

TTS Summary

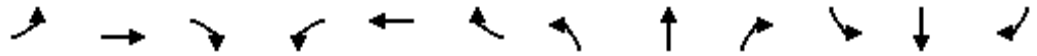
Time Period	Internal								External								Total
	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	
AM (IN)	4.3%	0.0%	0.0%	0.0%	9.0%	0.0%	31.1%	13.7%	0.0%	41.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
AM (OUT)	0.0%	0.0%	6.3%	8.5%	0.0%	0.0%	0.0%	46.6%	0.0%	30.7%	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%	100.0%
PM (IN)	2.4%	10.1%	2.8%	3.6%	3.2%	0.0%	0.0%	2.4%	12.3%	48.5%	4.9%	6.5%	0.0%	0.0%	0.0%	3.4%	100.0%
PM (OUT)	0.0%	3.1%	8.2%	11.7%	0.9%	0.0%	0.0%	11.9%	11.2%	23.2%	8.7%	17.1%	0.0%	0.0%	0.0%	4.1%	100.0%
SAT (IN)	14.5%	2.9%	3.9%	1.9%	4.4%	0.0%	2.9%	6.3%	3.8%	50.7%	4.3%	1.5%	0.0%	0.0%	0.0%	3.0%	100.0%
SAT (OUT)	0.0%	2.5%	7.1%	17.5%	0.0%	0.0%	0.0%	17.8%	10.4%	21.3%	1.1%	5.2%	0.0%	0.0%	0.0%	17.2%	100.0%

APPENDIX M

2031 Future Total Detailed Capacity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	186	113	58	387	217	188	274	38	90	163	181
Future Volume (vph)	149	186	113	58	387	217	188	274	38	90	163	181
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.98						
Frt			0.850			0.850		0.982				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1403	1630	1471	1390	1646	1631	0	1554	1716	1240
Flt Permitted	0.400			0.631			0.646			0.513		
Satd. Flow (perm)	629	1535	1403	1083	1471	1368	1119	1631	0	839	1716	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			123			212		10				197
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
Confl. Peds. (#/hr)	4					4						
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 (%)	11%	14%	6%	2%	19%	7%	1%	6%	1%	7%	2%	20%
Adj. Flow (vph)	162	202	123	63	421	236	204	298	41	98	177	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	202	123	63	421	236	204	339	0	98	177	197
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

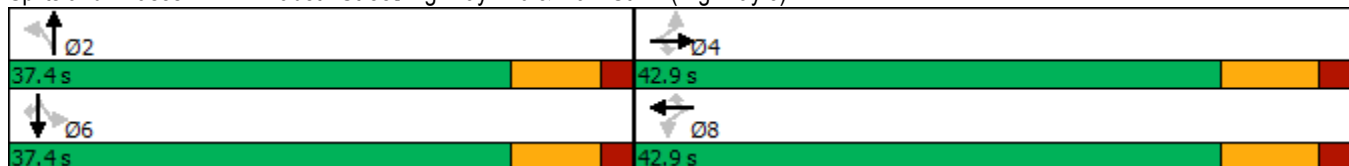


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	26.9	26.9	26.9	26.9	26.9	26.9	30.3	30.3		30.3	30.3	30.3
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.42	0.42		0.42	0.42	0.42
v/c Ratio	0.70	0.36	0.21	0.16	0.77	0.37	0.44	0.49		0.28	0.25	0.31
Control Delay	36.1	17.9	3.8	15.4	30.4	4.9	20.9	19.8		19.3	16.8	4.3
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	36.1	17.9	3.8	15.4	30.4	4.9	20.9	19.8		19.3	16.8	4.3
LOS	D	B	A	B	C	A	C	B		B	B	A
Approach Delay		20.4			20.7			20.2			12.1	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 72.6
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 18.7
 Intersection Capacity Utilization 86.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service E

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2031 FT AM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	162	202	123	63	421	236	204	339	98	177	197
v/c Ratio	0.70	0.36	0.21	0.16	0.77	0.37	0.44	0.49	0.28	0.25	0.31
Control Delay	36.1	17.9	3.8	15.4	30.4	4.9	20.9	19.8	19.3	16.8	4.3
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	36.1	17.9	3.8	15.4	30.4	4.9	20.9	19.8	19.3	16.8	4.3
Queue Length 50th (m)	19.1	20.3	0.0	5.9	51.5	2.2	20.8	34.3	9.2	16.4	0.0
Queue Length 95th (m)	41.9	35.7	9.2	13.5	84.1	15.1	45.1	67.0	23.5	34.7	13.1
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	306	747	745	527	716	774	467	686	350	716	632
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	0.53	0.27	0.17	0.12	0.59	0.30	0.44	0.49	0.28	0.25	0.31

Intersection Summary

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2031 FT AM
12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	231	74	5	351	0	289	0	5	0	0	2
Future Volume (vph)	1	231	74	5	351	0	289	0	5	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967						0.998			0.865	
Flt Protected					0.999			0.953				
Satd. Flow (prot)	0	1454	0	0	1391	0	0	1632	0	0	1484	0
Flt Permitted					0.999			0.953				
Satd. Flow (perm)	0	1454	0	0	1391	0	0	1632	0	0	1484	0
Link Speed (k/h)		70			80			40			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			9.3			14.0	
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%	21%	2%	2%	26%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	251	80	5	382	0	314	0	5	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	332	0	0	387	0	0	319	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.1%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2031 FT AM
12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	231	74	5	351	0	289	0	5	0	0	2
Future Volume (Veh/h)	1	231	74	5	351	0	289	0	5	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	251	80	5	382	0	314	0	5	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	382			331			687	685	291	690	725	382
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	382			331			687	685	291	690	725	382
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			12	100	99	100	100	100
cM capacity (veh/h)	1176			1228			359	369	748	356	350	665
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	332	387	319	2								
Volume Left	1	5	314	0								
Volume Right	80	0	5	2								
cSH	1176	1228	362	665								
Volume to Capacity	0.00	0.00	0.88	0.00								
Queue Length 95th (m)	0.0	0.1	68.8	0.1								
Control Delay (s)	0.0	0.1	56.7	10.4								
Lane LOS	A	A	F	B								
Approach Delay (s)	0.0	0.1	56.7	10.4								
Approach LOS			F	B								
Intersection Summary												
Average Delay			17.5									
Intersection Capacity Utilization			55.1%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2031 FT AM
 12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (vph)	5	219	21	11	303	0	38	9	21	0	2	2
Future Volume (vph)	5	219	21	11	303	0	38	9	21	0	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.958			0.932	
Flt Protected		0.999			0.998			0.973				
Satd. Flow (prot)	0	1461	1473	0	1418	1716	0	1608	0	0	1607	0
Flt Permitted		0.999			0.998			0.973				
Satd. Flow (perm)	0	1461	1473	0	1418	1716	0	1608	0	0	1607	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	20%	1%	1%	24%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	5	238	23	12	329	0	41	10	23	0	2	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	243	23	0	341	0	0	74	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

















2031 FT AM
 12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (veh/h)	5	219	21	11	303	0	38	9	21	0	2	2
Future Volume (Veh/h)	5	219	21	11	303	0	38	9	21	0	2	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	238	23	12	329	0	41	10	23	0	2	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	329			261			604	601	238	629	624	329
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	329			261			604	601	238	629	624	329
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			90	98	97	100	99	100
cM capacity (veh/h)	1231			1309			405	409	801	373	396	715
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	243	23	341	0	74	4						
Volume Left	5	0	12	0	41	0						
Volume Right	0	23	0	0	23	2						
cSH	1231	1700	1309	1700	479	510						
Volume to Capacity	0.00	0.01	0.01	0.00	0.15	0.01						
Queue Length 95th (m)	0.1	0.0	0.2	0.0	4.3	0.2						
Control Delay (s)	0.2	0.0	0.4	0.0	13.9	12.1						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.2		0.4		13.9	12.1						
Approach LOS					B	B						
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			44.5%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2031 FT AM
12/18/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	131	6	7	103	6	5	5	4	12	4	3
Future Volume (vph)	3	131	6	7	103	6	5	5	4	12	4	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.993			0.961			0.980	
Flt Protected		0.999			0.997			0.982			0.969	
Satd. Flow (prot)	0	1659	0	0	1602	0	0	1625	0	0	1632	0
Flt Permitted		0.999			0.997			0.982			0.969	
Satd. Flow (perm)	0	1659	0	0	1602	0	0	1625	0	0	1632	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		827.0			560.6			68.7			892.0	
Travel Time (s)		49.6			33.6			4.9			53.5	
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%	5%	1%	2%	9%	2%	2%	1%	2%	2%	1%	2%
Adj. Flow (vph)	3	142	7	8	112	7	5	5	4	13	4	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	152	0	0	127	0	0	14	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2031 FT AM
12/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	131	6	7	103	6	5	5	4	12	4	3
Future Volume (Veh/h)	3	131	6	7	103	6	5	5	4	12	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	3	142	7	8	112	7	5	5	4	13	4	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	119			149			288	286	146	290	286	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	119			149			288	286	146	290	286	116
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	99	100	98	99	100
cM capacity (veh/h)	1469			1432			655	620	902	652	620	937
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	152	127	14	20								
Volume Left	3	8	5	13								
Volume Right	7	7	4	3								
cSH	1469	1432	695	676								
Volume to Capacity	0.00	0.01	0.02	0.03								
Queue Length 95th (m)	0.0	0.1	0.5	0.7								
Control Delay (s)	0.2	0.5	10.3	10.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	10.3	10.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			20.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Killaly St. E & Snider Road

2031 FT AM
12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	29	200	3	0	204	6	0	0	0	15	0	52
Future Volume (vph)	29	200	3	0	204	6	0	0	0	15	0	52
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.998			0.996							0.895
Fl _t Protected		0.994										0.989
Satd. Flow (prot)	0	1702	0	0	1709	0	0	1716	0	0	1519	0
Fl _t Permitted		0.994										0.989
Satd. Flow (perm)	0	1702	0	0	1709	0	0	1716	0	0	1519	0
Link Speed (k/h)		40			60			50				40
Link Distance (m)		835.9			827.0			99.1				923.1
Travel Time (s)		75.2			49.6			7.1				83.1
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
Adj. Flow (vph)	32	217	3	0	222	7	0	0	0	16	0	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	252	0	0	229	0	0	0	0	0	73	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
5: Killaly St. E & Snider Road

2031 FT AM
12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	29	200	3	0	204	6	0	0	0	15	0	52
Future Volume (Veh/h)	29	200	3	0	204	6	0	0	0	15	0	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	32	217	3	0	222	7	0	0	0	16	0	57
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	229			220			565	512	218	508	510	226
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229			220			565	512	218	508	510	226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	97	100	93
cM capacity (veh/h)	1339			1349			398	455	821	467	456	814
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	252	229	0	73								
Volume Left	32	0	0	16								
Volume Right	3	7	0	57								
cSH	1339	1349	1700	700								
Volume to Capacity	0.02	0.00	0.00	0.10								
Queue Length 95th (m)	0.6	0.0	0.0	2.8								
Control Delay (s)	1.2	0.0	0.0	10.7								
Lane LOS	A		A	B								
Approach Delay (s)	1.2	0.0	0.0	10.7								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			39.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2031 FT AM
12/18/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
Future Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.979			0.966			0.919	
Flt Protected		0.985						0.996			0.985	
Satd. Flow (prot)	0	1600	0	0	1514	0	0	1663	0	0	1562	0
Flt Permitted		0.985						0.996			0.985	
Satd. Flow (perm)	0	1600	0	0	1514	0	0	1663	0	0	1562	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		1	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 (%)	4%	9%	2%	2%	15%	4%	1%	1%	2%	2%	2%	1%
Adj. Flow (vph)	108	250	7	3	361	68	3	27	10	66	20	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	365	0	0	432	0	0	40	0	0	215	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

























Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.1%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2031 FT AM
12/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	230	6	3	332	63	3	25	9	61	18	119
Future Volume (Veh/h)	99	230	6	3	332	63	3	25	9	61	18	119
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	108	250	7	3	361	68	3	27	10	66	20	129
Pedestrians					1						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	430			257			1010	906	254	896	875	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	430			257			1010	906	254	896	875	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			98	89	99	70	92	80
cM capacity (veh/h)	1118			1308			153	250	783	218	259	655
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	365	432	40	215								
Volume Left	108	3	3	66								
Volume Right	7	68	10	129								
cSH	1118	1308	285	373								
Volume to Capacity	0.10	0.00	0.14	0.58								
Queue Length 95th (m)	2.6	0.1	3.9	27.8								
Control Delay (s)	3.2	0.1	19.7	27.0								
Lane LOS	A	A	C	D								
Approach Delay (s)	3.2	0.1	19.7	27.0								
Approach LOS			C	D								
Intersection Summary												
Average Delay			7.4									
Intersection Capacity Utilization			72.1%		ICU Level of Service				C			
Analysis Period (min)			15									

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	326	99	26	324	204	90	303	37	409	488	317
Future Volume (vph)	232	326	99	26	324	204	90	303	37	409	488	317
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.984				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1675	0	1614	1716	1352
Flt Permitted	0.389			0.549			0.190			0.403		
Satd. Flow (perm)	613	1535	1365	942	1683	1473	326	1675	0	685	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108			196		8				178
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	252	354	108	28	352	222	98	329	40	445	530	345
Shared Lane Traffic (%)												
Lane Group Flow (vph)	252	354	108	28	352	222	98	369	0	445	530	345
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	7	4			8			2				6

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

2031 FT PM
 12/19/2023

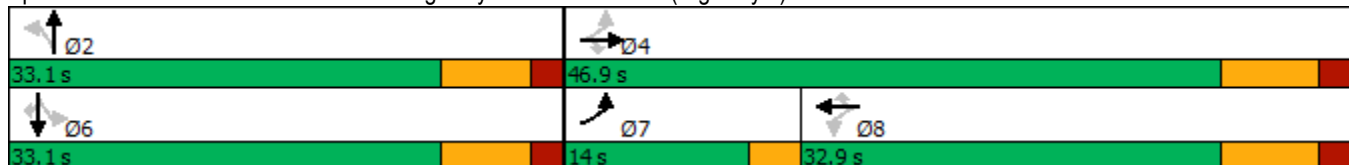


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	7	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	8.0	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	14.0	46.9	46.9	32.9	32.9	32.9	33.1	33.1		33.1	33.1	33.1
Total Split (%)	17.5%	58.6%	58.6%	41.1%	41.1%	41.1%	41.4%	41.4%		41.4%	41.4%	41.4%
Maximum Green (s)	11.0	39.0	39.0	25.0	25.0	25.0	25.7	25.7		25.7	25.7	25.7
Yellow Time (s)	3.0	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	0.0	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		0.0	0.0	0.0
Total Lost Time (s)	3.0	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max	Max	Max	Max	Max	Min	Min		Min	Min	Min
Walk Time (s)		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	43.9	39.0	39.0	25.5	25.5	25.5	25.7	25.7		25.7	25.7	25.7
Actuated g/C Ratio	0.55	0.49	0.49	0.32	0.32	0.32	0.32	0.32		0.32	0.32	0.32
v/c Ratio	0.56	0.47	0.15	0.09	0.66	0.37	0.94	0.68		2.02	0.96	0.62
Control Delay	15.1	16.3	3.0	20.7	30.6	6.6	107.1	30.5		497.5	59.1	16.4
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	15.1	16.3	3.0	20.7	30.6	6.6	107.1	30.5		497.5	59.1	16.4
LOS	B	B	A	C	C	A	F	C		F	E	B
Approach Delay		13.9			21.3			46.6			195.7	
Approach LOS		B			C			D			F	

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Natural Cycle: 100
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 2.02
 Intersection Signal Delay: 97.6
 Intersection Capacity Utilization 101.0%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	252	354	108	28	352	222	98	369	445	530	345
v/c Ratio	0.56	0.47	0.15	0.09	0.66	0.37	0.94	0.68	2.02	0.96	0.62
Control Delay	15.1	16.3	3.0	20.7	30.6	6.6	107.1	30.5	497.5	59.1	16.4
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	15.1	16.3	3.0	20.7	30.6	6.6	107.1	30.5	497.5	59.1	16.4
Queue Length 50th (m)	20.3	35.8	0.0	3.1	48.5	2.9	15.1	49.6	~113.2	82.4	21.0
Queue Length 95th (m)	34.6	58.8	7.8	9.1	78.1	18.3	#45.2	80.2	#169.0	#145.5	50.0
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	458	748	720	300	536	603	104	543	220	551	555
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	0.55	0.47	0.15	0.09	0.66	0.37	0.94	0.68	2.02	0.96	0.62

Intersection Summary

~ 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.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2031 FT PM
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	419	337	41	350	0	177	1	25	0	0	1
Future Volume (vph)	1	419	337	41	350	0	177	1	25	0	0	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.940						0.983			0.865		
Flt Protected							0.995			0.958		
Satd. Flow (prot)	0	1514	0	0	1663	0	0	1616	0	0	1484	0
Flt Permitted							0.995			0.958		
Satd. Flow (perm)	0	1514	0	0	1663	0	0	1616	0	0	1484	0
Link Speed (k/h)	70				80			40			50	
Link Distance (m)	841.1				852.0			103.0			194.5	
Travel Time (s)	43.3				38.3			9.3			14.0	
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	455	366	45	380	0	192	1	27	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	822	0	0	425	0	0	220	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6				3.6			0.0			0.0	
Link Offset(m)	0.0				0.0			0.0			0.0	
Crosswalk Width(m)	4.8				4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		25	15		25	15		25	15	
Sign Control	Free				Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	81.6%
ICU Level of Service	D
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2031 FT PM
 12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	419	337	41	350	0	177	1	25	0	0	1
Future Volume (Veh/h)	1	419	337	41	350	0	177	1	25	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	455	366	45	380	0	192	1	27	0	0	1
Pedestrians												1
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												0
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	381			821			1111	1111	638	1138	1294	381
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	381			821			1111	1111	638	1138	1294	381
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			0	99	94	100	100	100
cM capacity (veh/h)	1176			808			178	197	477	160	153	666
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	822	425	220	1								
Volume Left	1	45	192	0								
Volume Right	366	0	27	1								
cSH	1176	808	193	666								
Volume to Capacity	0.00	0.06	1.14	0.00								
Queue Length 95th (m)	0.0	1.4	87.5	0.0								
Control Delay (s)	0.0	1.7	158.2	10.4								
Lane LOS	A	A	F	B								
Approach Delay (s)	0.0	1.7	158.2	10.4								
Approach LOS			F	B								
Intersection Summary												
Average Delay			24.2									
Intersection Capacity Utilization			81.6%		ICU Level of Service					D		
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2031 FT PM
 12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	5	367	79	33	337	0	24	13	41	0	10	20
Future Volume (vph)	5	367	79	33	337	0	24	13	41	0	10	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.929			0.910	
Flt Protected		0.999			0.996			0.985				
Satd. Flow (prot)	0	1549	1473	0	1666	1716	0	1575	0	0	1572	0
Flt Permitted		0.999			0.996			0.985				
Satd. Flow (perm)	0	1549	1473	0	1666	1716	0	1575	0	0	1572	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	13%	1%	1%	5%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	5	399	86	36	366	0	26	14	45	0	11	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	404	86	0	402	0	0	85	0	0	33	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.1%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

















2031 FT PM
 12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕↗			↕↗	
Traffic Volume (veh/h)	5	367	79	33	337	0	24	13	41	0	10	20
Future Volume (Veh/h)	5	367	79	33	337	0	24	13	41	0	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	399	86	36	366	0	26	14	45	0	11	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	366			485			874	847	399	899	933	366
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366			485			874	847	399	899	933	366
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			89	95	93	100	96	97
cM capacity (veh/h)	1193			1083			247	288	651	226	256	681
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	404	86	402	0	85	33						
Volume Left	5	0	36	0	26	0						
Volume Right	0	86	0	0	45	22						
cSH	1193	1700	1083	1700	381	439						
Volume to Capacity	0.00	0.05	0.03	0.00	0.22	0.08						
Queue Length 95th (m)	0.1	0.0	0.8	0.0	6.7	1.9						
Control Delay (s)	0.1	0.0	1.1	0.0	17.2	13.9						
Lane LOS	A		A		C	B						
Approach Delay (s)	0.1		1.1		17.2	13.9						
Approach LOS					C	B						
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			64.1%	ICU Level of Service	C							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2031 FT PM
12/19/2023

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	284	6	6	196	23	7	4	8	31	10	7
Future Volume (vph)	8	284	6	6	196	23	7	4	8	31	10	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.986			0.942			0.980	
Flt Protected		0.999			0.999			0.981			0.969	
Satd. Flow (prot)	0	1725	0	0	1608	0	0	1594	0	0	1633	0
Flt Permitted		0.999			0.999			0.981			0.969	
Satd. Flow (perm)	0	1725	0	0	1608	0	0	1594	0	0	1633	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		827.0			560.6			68.7			892.0	
Travel Time (s)		49.6			33.6			4.9			53.5	
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%	1%	1%	2%	8%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	9	309	7	7	213	25	8	4	9	34	11	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	325	0	0	245	0	0	21	0	0	53	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2031 FT PM
12/19/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	284	6	6	196	23	7	4	8	31	10	7
Future Volume (Veh/h)	8	284	6	6	196	23	7	4	8	31	10	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	9	309	7	7	213	25	8	4	9	34	11	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	238			316			584	582	312	581	574	226
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	238			316			584	582	312	581	574	226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	99	99	92	97	99
cM capacity (veh/h)	1329			1244			409	420	728	413	425	814
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	325	245	21	53								
Volume Left	9	7	8	34								
Volume Right	7	25	9	8								
cSH	1329	1244	506	449								
Volume to Capacity	0.01	0.01	0.04	0.12								
Queue Length 95th (m)	0.2	0.1	1.0	3.2								
Control Delay (s)	0.3	0.3	12.4	14.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.4	14.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			32.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Killaly St. E & Snider Road

2031 FT PM
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	226	1	0	162	34	0	0	0	45	0	10
Future Volume (vph)	5	226	1	0	162	34	0	0	0	45	0	10
Ideal Flow (vphp)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.999			0.977							0.975
Fl _t Protected		0.999										0.961
Satd. Flow (prot)	0	1712	0	0	1676	0	0	1716	0	0	1608	0
Fl _t Permitted		0.999										0.961
Satd. Flow (perm)	0	1712	0	0	1676	0	0	1716	0	0	1608	0
Link Speed (k/h)		40			60			50				40
Link Distance (m)		835.9			827.0			99.1				923.1
Travel Time (s)		75.2			49.6			7.1				83.1
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
Adj. Flow (vph)	5	246	1	0	176	37	0	0	0	49	0	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	252	0	0	213	0	0	0	0	0	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
5: Killaly St. E & Snider Road

2031 FT PM
12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	226	1	0	162	34	0	0	0	45	0	10
Future Volume (Veh/h)	5	226	1	0	162	34	0	0	0	45	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	246	1	0	176	37	0	0	0	49	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	213			247			462	470	246	451	452	194
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	213			247			462	470	246	451	452	194
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	91	100	99
cM capacity (veh/h)	1357			1319			502	490	792	517	502	847
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	252	213	0	60								
Volume Left	5	0	0	49								
Volume Right	1	37	0	11								
cSH	1357	1319	1700	557								
Volume to Capacity	0.00	0.00	0.00	0.11								
Queue Length 95th (m)	0.1	0.0	0.0	2.9								
Control Delay (s)	0.2	0.0	0.0	12.2								
Lane LOS	A		A	B								
Approach Delay (s)	0.2	0.0	0.0	12.2								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			27.4%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2031 FT PM
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92
Future Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.959			0.986			0.944	
Flt Protected		0.983			0.998			0.992			0.977	
Satd. Flow (prot)	0	1688	0	0	1605	0	0	1693	0	0	1597	0
Flt Permitted		0.983			0.998			0.992			0.977	
Satd. Flow (perm)	0	1688	0	0	1605	0	0	1693	0	0	1597	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	99	180	4	8	166	75	5	22	3	113	27	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	283	0	0	249	0	0	30	0	0	240	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	59.4%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2031 FT PM
12/19/2023



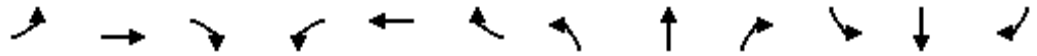
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	91	166	4	7	153	69	5	20	3	104	25	92
Future Volume (Veh/h)	91	166	4	7	153	69	5	20	3	104	25	92
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	180	4	8	166	75	5	22	3	113	27	100
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	242			184			713	638	185	618	602	204
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242			184			713	638	185	618	602	204
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			99			98	94	100	69	93	88
cM capacity (veh/h)	1317			1397			272	364	855	360	380	835
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	283	249	30	240								
Volume Left	99	8	5	113								
Volume Right	4	75	3	100								
cSH	1317	1397	364	475								
Volume to Capacity	0.08	0.01	0.08	0.50								
Queue Length 95th (m)	1.9	0.1	2.1	22.3								
Control Delay (s)	3.2	0.3	15.8	20.0								
Lane LOS	A	A	C	C								
Approach Delay (s)	3.2	0.3	15.8	20.0								
Approach LOS			C	C								
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			59.4%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings

2031 FT SAT

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/20/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	311	185	49	363	196	225	295	42	262	381	152
Future Volume (vph)	176	311	185	49	363	196	225	295	42	262	381	152
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.981				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1662	1683	1473	1630	1671	0	1614	1716	1352
Flt Permitted	0.422			0.497			0.443			0.493		
Satd. Flow (perm)	665	1535	1365	870	1683	1473	760	1671	0	838	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			201			204		10				118
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	0%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	191	338	201	53	395	213	245	321	46	285	414	165
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	338	201	53	395	213	245	367	0	285	414	165
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

2031 FT SAT
 12/20/2023

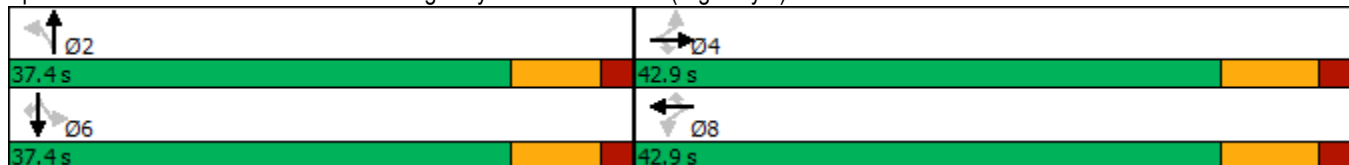


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	24.4	24.4	24.4	24.4	24.4	24.4	30.3	30.3		30.3	30.3	30.3
Actuated g/C Ratio	0.35	0.35	0.35	0.35	0.35	0.35	0.43	0.43		0.43	0.43	0.43
v/c Ratio	0.83	0.63	0.33	0.18	0.68	0.33	0.75	0.50		0.79	0.56	0.25
Control Delay	49.8	24.4	4.0	16.3	25.3	4.2	36.9	18.9		38.8	20.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	49.8	24.4	4.0	16.3	25.3	4.2	36.9	18.9		38.8	20.4	6.9
LOS	D	C	A	B	C	A	D	B		D	C	A
Approach Delay		25.4			17.8			26.1			23.9	
Approach LOS		C			B			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 70.2
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 23.4
 Intersection LOS: C
 Intersection Capacity Utilization 94.1%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2031 FT SAT

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/20/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	191	338	201	53	395	213	245	367	285	414	165
v/c Ratio	0.83	0.63	0.33	0.18	0.68	0.33	0.75	0.50	0.79	0.56	0.25
Control Delay	49.8	24.4	4.0	16.3	25.3	4.2	36.9	18.9	38.8	20.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	24.4	4.0	16.3	25.3	4.2	36.9	18.9	38.8	20.4	6.9
Queue Length 50th (m)	23.4	37.8	0.0	4.9	45.1	0.8	26.9	33.9	32.2	40.6	3.6
Queue Length 95th (m)	#55.7	62.0	11.5	12.2	72.0	12.8	#79.1	72.7	#90.8	84.9	17.5
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	334	773	787	438	848	843	328	727	362	741	651
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	0.57	0.44	0.26	0.12	0.47	0.25	0.75	0.50	0.79	0.56	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2031 FT SAT
12/20/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Volume (vph)	0	347	305	23	324	0	252	0	24	0	0	0	
Future Volume (vph)	0	347	305	23	324	0	252	0	24	0	0	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.937						0.988						
Flt Protected							0.997			0.956			
Satd. Flow (prot)	0	1513	0	0	1665	0	0	1621	0	0	1716	0	
Flt Permitted							0.997			0.956			
Satd. Flow (perm)	0	1513	0	0	1665	0	0	1621	0	0	1716	0	
Link Speed (k/h)					70			80			40		50
Link Distance (m)	841.1				852.0			103.0			194.5		
Travel Time (s)	43.3				38.3			9.3			14.0		
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%	
Adj. Flow (vph)	0	377	332	25	352	0	274	0	26	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	709	0	0	377	0	0	300	0	0	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	3.6				3.6			0.0			0.0		
Link Offset(m)	0.0				0.0			0.0			0.0		
Crosswalk Width(m)	4.8				4.8			4.8			4.8		
Two way Left Turn Lane													
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	
Turning Speed (k/h)	25		15		25		15		25		15		
Sign Control	Free				Free			Stop			Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	63.5%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2031 FT SAT
12/20/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	347	305	23	324	0	252	0	24	0	0	0
Future Volume (Veh/h)	0	347	305	23	324	0	252	0	24	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	377	332	25	352	0	274	0	26	0	0	0
Pedestrians												1
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												0
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	353			709			945	946	543	972	1112	353
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	353			709			945	946	543	972	1112	353
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			0	100	95	100	100	100
cM capacity (veh/h)	1205			890			236	254	540	216	203	690
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	709	377	300	0								
Volume Left	0	25	274	0								
Volume Right	332	0	26	0								
cSH	1205	890	249	1700								
Volume to Capacity	0.00	0.03	1.21	0.00								
Queue Length 95th (m)	0.0	0.7	114.4	0.0								
Control Delay (s)	0.0	0.9	166.1	0.0								
Lane LOS		A	F	A								
Approach Delay (s)	0.0	0.9	166.1	0.0								
Approach LOS			F	A								
Intersection Summary												
Average Delay			36.2									
Intersection Capacity Utilization			63.5%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2031 FT SAT
 12/20/2023






















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	5	315	14	24	301	2	23	14	39	0	6	9
Future Volume (vph)	5	315	14	24	301	2	23	14	39	0	6	9
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.931			0.921	
Flt Protected		0.999			0.996			0.985				
Satd. Flow (prot)	0	1549	1473	0	1665	1458	0	1578	0	0	1589	0
Flt Permitted		0.999			0.996			0.985				
Satd. Flow (perm)	0	1549	1473	0	1665	1458	0	1578	0	0	1589	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	13%	1%	1%	5%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	5	342	15	26	327	2	25	15	42	0	7	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	347	15	0	353	2	0	82	0	0	17	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	56.8%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2031 FT SAT
 12/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	315	14	24	301	2	23	14	39	0	6	9
Future Volume (Veh/h)	5	315	14	24	301	2	23	14	39	0	6	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	342	15	26	327	2	25	15	42	0	7	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	329		357		744		733	342	780	746	327	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	329		357		744		733	342	780	746	327	
tC, single (s)	4.1		4.1		7.1		6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)												
tF (s)	2.2		2.2		3.5		4.0	3.3	3.5	4.0	3.3	
p0 queue free %	100		98		92		96	94	100	98	99	
cM capacity (veh/h)	1231		1207		315		339	701	278	333	717	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	347	15	353	2	82	17						
Volume Left	5	0	26	0	25	0						
Volume Right	0	15	0	2	42	10						
cSH	1231	1700	1207	1700	447	486						
Volume to Capacity	0.00	0.01	0.02	0.00	0.18	0.03						
Queue Length 95th (m)	0.1	0.0	0.5	0.0	5.3	0.9						
Control Delay (s)	0.2	0.0	0.8	0.0	14.9	12.7						
Lane LOS	A		A		B		B					
Approach Delay (s)	0.1		0.8		14.9		12.7					
Approach LOS					B		B					
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			56.8%		ICU Level of Service		B					
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2031 FT SAT
12/20/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	225	8	6	137	11	3	2	9	27	7	9
Future Volume (vph)	4	225	8	6	137	11	3	2	9	27	7	9
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.990			0.910			0.971	
Flt Protected		0.999			0.998			0.990			0.970	
Satd. Flow (prot)	0	1722	0	0	1611	0	0	1551	0	0	1619	0
Flt Permitted		0.999			0.998			0.990			0.970	
Satd. Flow (perm)	0	1722	0	0	1611	0	0	1551	0	0	1619	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		827.0			560.6			68.7			892.0	
Travel Time (s)		49.6			33.6			4.9			53.5	
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%	1%	1%	2%	8%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	4	245	9	7	149	12	3	2	10	29	8	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	258	0	0	168	0	0	15	0	0	47	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2031 FT SAT
12/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	225	8	6	137	11	3	2	9	27	7	9
Future Volume (Veh/h)	4	225	8	6	137	11	3	2	9	27	7	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	4	245	9	7	149	12	3	2	10	29	8	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	161			254			440	432	250	438	431	155
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	161			254			440	432	250	438	431	155
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	99	94	98	99
cM capacity (veh/h)	1418			1311			513	513	789	518	514	891
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	258	168	15	47								
Volume Left	4	7	3	29								
Volume Right	9	12	10	10								
cSH	1418	1311	669	568								
Volume to Capacity	0.00	0.01	0.02	0.08								
Queue Length 95th (m)	0.1	0.1	0.5	2.2								
Control Delay (s)	0.1	0.4	10.5	11.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.4	10.5	11.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			28.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Killaly St. E & Snider Road

2031 FT SAT
12/20/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	14	182	2	0	148	18	0	0	0	35	0	17
Future Volume (vph)	14	182	2	0	148	18	0	0	0	35	0	17
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.985							0.957
Flt Protected		0.997										0.967
Satd. Flow (prot)	0	1709	0	0	1690	0	0	1716	0	0	1588	0
Flt Permitted		0.997										0.967
Satd. Flow (perm)	0	1709	0	0	1690	0	0	1716	0	0	1588	0
Link Speed (k/h)		40			60			50				40
Link Distance (m)		835.9			827.0			99.1				923.1
Travel Time (s)		75.2			49.6			7.1				83.1
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
Adj. Flow (vph)	15	198	2	0	161	20	0	0	0	38	0	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	215	0	0	181	0	0	0	0	0	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
5: Killaly St. E & Snider Road

2031 FT SAT
12/20/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	14	182	2	0	148	18	0	0	0	35	0	17
Future Volume (Veh/h)	14	182	2	0	148	18	0	0	0	35	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	15	198	2	0	161	20	0	0	0	38	0	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	181			200			418	410	199	400	401	171
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	181			200			418	410	199	400	401	171
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	93	100	98
cM capacity (veh/h)	1394			1372			530	526	842	556	532	873
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	215	181	0	56								
Volume Left	15	0	0	38								
Volume Right	2	20	0	18								
cSH	1394	1372	1700	629								
Volume to Capacity	0.01	0.00	0.00	0.09								
Queue Length 95th (m)	0.3	0.0	0.0	2.3								
Control Delay (s)	0.6	0.0	0.0	11.3								
Lane LOS	A		A	B								
Approach Delay (s)	0.6	0.0	0.0	11.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			33.1%	ICU Level of Service		A						
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2031 FT SAT
12/20/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
Future Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.957			0.984				0.950
Flt Protected		0.984			0.999			0.997				0.973
Satd. Flow (prot)	0	1691	0	0	1604	0	0	1698	0	0	1603	0
Flt Permitted		0.984			0.999			0.997				0.973
Satd. Flow (perm)	0	1691	0	0	1604	0	0	1698	0	0	1603	0
Link Speed (k/h)		50			50			50				40
Link Distance (m)		201.0			835.9			155.4				1044.5
Travel Time (s)		14.5			60.2			11.2				94.0
Confl. Peds. (#/hr)	1						1		3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	86	180	4	7	190	92	2	27	4	165	25	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	0	0	289	0	0	33	0	0	301	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.4%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2031 FT SAT
12/20/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	79	166	4	6	175	85	2	25	4	152	23	102
Future Volume (Veh/h)	79	166	4	6	175	85	2	25	4	152	23	102
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	86	180	4	7	190	92	2	27	4	165	25	111
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	283			184			728	651	185	626	607	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	283			184			728	651	185	626	607	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			99	93	100	53	93	86
cM capacity (veh/h)	1273			1397			263	361	855	353	381	801
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	270	289	33	301								
Volume Left	86	7	2	165								
Volume Right	4	92	4	111								
cSH	1273	1397	379	448								
Volume to Capacity	0.07	0.01	0.09	0.67								
Queue Length 95th (m)	1.7	0.1	2.3	38.8								
Control Delay (s)	3.0	0.2	15.4	27.9								
Lane LOS	A	A	C	D								
Approach Delay (s)	3.0	0.2	15.4	27.9								
Approach LOS			C	D								
Intersection Summary												
Average Delay			11.0									
Intersection Capacity Utilization			64.4%		ICU Level of Service				C			
Analysis Period (min)			15									

APPENDIX N

2036 Future Total Detailed Capacity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	206	125	65	430	242	188	274	38	92	171	180
Future Volume (vph)	165	206	125	65	430	242	188	274	38	92	171	180
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.98						
Frt			0.850			0.850		0.982				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1403	1630	1471	1390	1646	1631	0	1554	1716	1240
Flt Permitted	0.356			0.619			0.640			0.505		
Satd. Flow (perm)	560	1535	1403	1062	1471	1368	1109	1631	0	826	1716	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			213		10				196
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
Confl. Peds. (#/hr)	4					4						
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 (%)	11%	14%	6%	2%	19%	7%	1%	6%	1%	7%	2%	20%
Adj. Flow (vph)	179	224	136	71	467	263	204	298	41	100	186	196
Shared Lane Traffic (%)												
Lane Group Flow (vph)	179	224	136	71	467	263	204	339	0	100	186	196
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

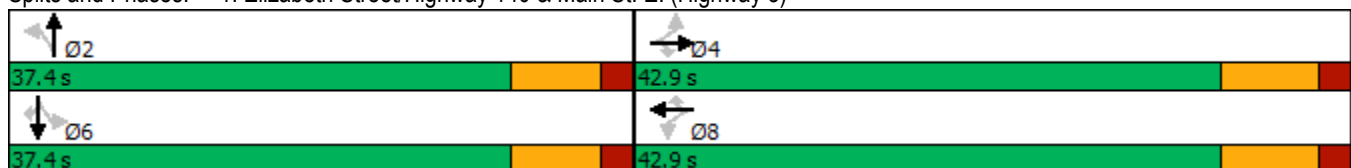


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	28.7	28.7	28.7	28.7	28.7	28.7	30.2	30.2		30.2	30.2	30.2
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39	0.41	0.41		0.41	0.41	0.41
v/c Ratio	0.83	0.38	0.22	0.17	0.82	0.40	0.45	0.51		0.30	0.27	0.32
Control Delay	52.2	17.9	3.7	15.4	33.5	5.7	22.0	20.8		20.2	17.6	4.4
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	52.2	17.9	3.7	15.4	33.5	5.7	22.0	20.8		20.2	17.6	4.4
LOS	D	B	A	B	C	A	C	C		C	B	A
Approach Delay		25.7			22.8			21.2			12.8	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 74.4
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 21.0
 Intersection Capacity Utilization 89.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	179	224	136	71	467	263	204	339	100	186	196
v/c Ratio	0.83	0.38	0.22	0.17	0.82	0.40	0.45	0.51	0.30	0.27	0.32
Control Delay	52.2	17.9	3.7	15.4	33.5	5.7	22.0	20.8	20.2	17.6	4.4
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	52.2	17.9	3.7	15.4	33.5	5.7	22.0	20.8	20.2	17.6	4.4
Queue Length 50th (m)	23.0	22.9	0.0	6.7	59.8	4.6	22.7	37.4	10.3	18.9	0.0
Queue Length 95th (m)	#58.0	39.6	9.6	15.0	97.7	18.8	45.3	67.0	24.1	36.1	13.0
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	265	728	737	503	697	760	450	668	335	697	620
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	0.68	0.31	0.18	0.14	0.67	0.35	0.45	0.51	0.30	0.27	0.32

















Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2036 FT AM
12/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	259	74	5	423	0	289	0	5	0	0	2
Future Volume (vph)	1	259	74	5	423	0	289	0	5	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.970						0.998			0.865	
Flt Protected					0.999			0.953				
Satd. Flow (prot)	0	1454	0	0	1390	0	0	1632	0	0	1484	0
Flt Permitted					0.999			0.953				
Satd. Flow (perm)	0	1454	0	0	1390	0	0	1632	0	0	1484	0
Link Speed (k/h)		70			80			40			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			9.3			14.0	
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%	21%	2%	2%	26%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	282	80	5	460	0	314	0	5	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	363	0	0	465	0	0	319	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.2%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2036 FT AM
 12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	259	74	5	423	0	289	0	5	0	0	2
Future Volume (Veh/h)	1	259	74	5	423	0	289	0	5	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	282	80	5	460	0	314	0	5	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	460			362			796	794	322	799	834	460
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	460			362			796	794	322	799	834	460
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			0	100	99	100	100	100
cM capacity (veh/h)	1101			1197			303	319	719	300	302	601
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	363	465	319	2								
Volume Left	1	5	314	0								
Volume Right	80	0	5	2								
cSH	1101	1197	306	601								
Volume to Capacity	0.00	0.00	1.04	0.00								
Queue Length 95th (m)	0.0	0.1	94.5	0.1								
Control Delay (s)	0.0	0.1	101.7	11.0								
Lane LOS	A	A	F	B								
Approach Delay (s)	0.0	0.1	101.7	11.0								
Approach LOS			F	B								
Intersection Summary												
Average Delay			28.3									
Intersection Capacity Utilization			59.2%	ICU Level of Service							B	
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2036 FT AM
 12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	5	246	21	11	373	0	38	9	21	0	2	2
Future Volume (vph)	5	246	21	11	373	0	38	9	21	0	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.958			0.932	
Flt Protected		0.999			0.999			0.973				
Satd. Flow (prot)	0	1461	1473	0	1417	1716	0	1608	0	0	1607	0
Flt Permitted		0.999			0.999			0.973				
Satd. Flow (perm)	0	1461	1473	0	1417	1716	0	1608	0	0	1607	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	20%	1%	1%	24%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	5	267	23	12	405	0	41	10	23	0	2	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	272	23	0	417	0	0	74	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2036 FT AM
 12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕↗			↕↗	
Traffic Volume (veh/h)	5	246	21	11	373	0	38	9	21	0	2	2
Future Volume (Veh/h)	5	246	21	11	373	0	38	9	21	0	2	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	267	23	12	405	0	41	10	23	0	2	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	405			290			709	706	267	734	729	405
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	405			290			709	706	267	734	729	405
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			88	97	97	100	99	100
cM capacity (veh/h)	1154			1278			344	356	772	315	345	648
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	272	23	417	0	74	4						
Volume Left	5	0	12	0	41	0						
Volume Right	0	23	0	0	23	2						
cSH	1154	1700	1278	1700	418	450						
Volume to Capacity	0.00	0.01	0.01	0.00	0.18	0.01						
Queue Length 95th (m)	0.1	0.0	0.2	0.0	5.1	0.2						
Control Delay (s)	0.2	0.0	0.3	0.0	15.5	13.1						
Lane LOS	A		A		C	B						
Approach Delay (s)	0.2		0.3		15.5	13.1						
Approach LOS					C	B						
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			48.5%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2036 FT AM
12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	3	131	6	7	103	6	5	5	4	12	4	3
Future Volume (vph)	3	131	6	7	103	6	5	5	4	12	4	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.993			0.961			0.980	
Flt Protected		0.999			0.997			0.982			0.969	
Satd. Flow (prot)	0	1659	0	0	1602	0	0	1625	0	0	1632	0
Flt Permitted		0.999			0.997			0.982			0.969	
Satd. Flow (perm)	0	1659	0	0	1602	0	0	1625	0	0	1632	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		827.0			560.6			68.7			892.0	
Travel Time (s)		49.6			33.6			4.9			53.5	
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%	5%	1%	2%	9%	2%	2%	1%	2%	2%	1%	2%
Adj. Flow (vph)	3	142	7	8	112	7	5	5	4	13	4	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	152	0	0	127	0	0	14	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2036 FT AM
12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	3	131	6	7	103	6	5	5	4	12	4	3
Future Volume (Veh/h)	3	131	6	7	103	6	5	5	4	12	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	3	142	7	8	112	7	5	5	4	13	4	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	119			149			288	286	146	290	286	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	119			149			288	286	146	290	286	116
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	99	100	98	99	100
cM capacity (veh/h)	1469			1432			655	620	902	652	620	937
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	152	127	14	20								
Volume Left	3	8	5	13								
Volume Right	7	7	4	3								
cSH	1469	1432	695	676								
Volume to Capacity	0.00	0.01	0.02	0.03								
Queue Length 95th (m)	0.0	0.1	0.5	0.7								
Control Delay (s)	0.2	0.5	10.3	10.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	10.3	10.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			20.2%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Killaly St. E & Snider Road

2036 FT AM
12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	29	200	3	0	204	6	0	0	0	15	0	52
Future Volume (vph)	29	200	3	0	204	6	0	0	0	15	0	52
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.998			0.996							0.895
Fl _t Protected		0.994										0.989
Satd. Flow (prot)	0	1702	0	0	1709	0	0	1716	0	0	1519	0
Fl _t Permitted		0.994										0.989
Satd. Flow (perm)	0	1702	0	0	1709	0	0	1716	0	0	1519	0
Link Speed (k/h)		40			60			50				40
Link Distance (m)		835.9			827.0			99.1				923.1
Travel Time (s)		75.2			49.6			7.1				83.1
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
Adj. Flow (vph)	32	217	3	0	222	7	0	0	0	16	0	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	252	0	0	229	0	0	0	0	0	73	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
5: Killaly St. E & Snider Road

2036 FT AM
12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	29	200	3	0	204	6	0	0	0	15	0	52
Future Volume (Veh/h)	29	200	3	0	204	6	0	0	0	15	0	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	32	217	3	0	222	7	0	0	0	16	0	57
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	229			220			565	512	218	508	510	226
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229			220			565	512	218	508	510	226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	97	100	93
cM capacity (veh/h)	1339			1349			398	455	821	467	456	814
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	252	229	0	73								
Volume Left	32	0	0	16								
Volume Right	3	7	0	57								
cSH	1339	1349	1700	700								
Volume to Capacity	0.02	0.00	0.00	0.10								
Queue Length 95th (m)	0.6	0.0	0.0	2.8								
Control Delay (s)	1.2	0.0	0.0	10.7								
Lane LOS	A		A	B								
Approach Delay (s)	1.2	0.0	0.0	10.7								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			39.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2036 FT AM
12/18/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
Future Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.979			0.966			0.919	
Flt Protected		0.985						0.996			0.985	
Satd. Flow (prot)	0	1600	0	0	1514	0	0	1663	0	0	1562	0
Flt Permitted		0.985						0.996			0.985	
Satd. Flow (perm)	0	1600	0	0	1514	0	0	1663	0	0	1562	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		1	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 (%)	4%	9%	2%	2%	15%	4%	1%	1%	2%	2%	2%	1%
Adj. Flow (vph)	108	250	7	3	361	68	3	27	10	66	20	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	365	0	0	432	0	0	40	0	0	215	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.1%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2036 FT AM
12/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	230	6	3	332	63	3	25	9	61	18	119
Future Volume (Veh/h)	99	230	6	3	332	63	3	25	9	61	18	119
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	108	250	7	3	361	68	3	27	10	66	20	129
Pedestrians					1						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	430			257			1010	906	254	896	875	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	430			257			1010	906	254	896	875	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			98	89	99	70	92	80
cM capacity (veh/h)	1118			1308			153	250	783	218	259	655
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	365	432	40	215								
Volume Left	108	3	3	66								
Volume Right	7	68	10	129								
cSH	1118	1308	285	373								
Volume to Capacity	0.10	0.00	0.14	0.58								
Queue Length 95th (m)	2.6	0.1	3.9	27.8								
Control Delay (s)	3.2	0.1	19.7	27.0								
Lane LOS	A	A	C	D								
Approach Delay (s)	3.2	0.1	19.7	27.0								
Approach LOS			C	D								
Intersection Summary												
Average Delay			7.4									
Intersection Capacity Utilization			72.1%		ICU Level of Service				C			
Analysis Period (min)			15									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	359	105	29	360	212	90	303	37	416	498	345
Future Volume (vph)	262	359	105	29	360	212	90	303	37	416	498	345
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.984				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1675	0	1614	1716	1352
Flt Permitted	0.338			0.531			0.176			0.403		
Satd. Flow (perm)	533	1535	1365	911	1683	1473	302	1675	0	685	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			114			183		8				190
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	285	390	114	32	391	230	98	329	40	452	541	375
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	390	114	32	391	230	98	369	0	452	541	375
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	7	4			8			2				6

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

2036 FT PM
 12/19/2023

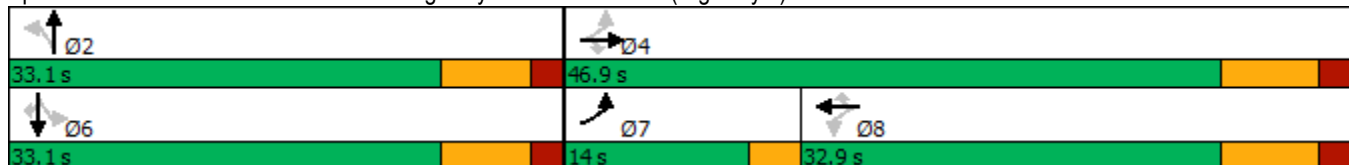


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	7	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	8.0	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	14.0	46.9	46.9	32.9	32.9	32.9	33.1	33.1		33.1	33.1	33.1
Total Split (%)	17.5%	58.6%	58.6%	41.1%	41.1%	41.1%	41.4%	41.4%		41.4%	41.4%	41.4%
Maximum Green (s)	11.0	39.0	39.0	25.0	25.0	25.0	25.7	25.7		25.7	25.7	25.7
Yellow Time (s)	3.0	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	0.0	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		0.0	0.0	0.0
Total Lost Time (s)	3.0	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max	Max	Max	Max	Max	Min	Min		Min	Min	Min
Walk Time (s)		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	43.9	39.0	39.0	25.3	25.3	25.3	25.7	25.7		25.7	25.7	25.7
Actuated g/C Ratio	0.55	0.49	0.49	0.32	0.32	0.32	0.32	0.32		0.32	0.32	0.32
v/c Ratio	0.68	0.52	0.16	0.11	0.73	0.39	1.01	0.68		2.05	0.98	0.67
Control Delay	19.5	17.2	3.0	21.0	34.4	7.9	128.5	30.5		511.4	63.5	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	19.5	17.2	3.0	21.0	34.4	7.9	128.5	30.5		511.4	63.5	17.9
LOS	B	B	A	C	C	A	F	C		F	E	B
Approach Delay		16.0			24.4			51.1			199.0	
Approach LOS		B			C			D			F	

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Natural Cycle: 90
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 2.05
 Intersection Signal Delay: 99.1
 Intersection Capacity Utilization 103.4%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	285	390	114	32	391	230	98	369	452	541	375
v/c Ratio	0.68	0.52	0.16	0.11	0.73	0.39	1.01	0.68	2.05	0.98	0.67
Control Delay	19.5	17.2	3.0	21.0	34.4	7.9	128.5	30.5	511.4	63.5	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	17.2	3.0	21.0	34.4	7.9	128.5	30.5	511.4	63.5	17.9
Queue Length 50th (m)	23.5	40.7	0.0	3.6	55.5	5.3	~15.8	49.6	~115.6	85.0	24.0
Queue Length 95th (m)	39.6	66.1	8.0	10.2	#96.3	21.8	#46.5	80.2	#171.7	#149.5	55.9
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	425	748	723	288	532	591	97	543	220	551	563
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	0.67	0.52	0.16	0.11	0.73	0.39	1.01	0.68	2.05	0.98	0.67

Intersection Summary

~ 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.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2036 FT PM
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Volume (vph)	1	465	337	41	394	0	177	1	25	0	0	1	
Future Volume (vph)	1	465	337	41	394	0	177	1	25	0	0	1	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.943							0.983		0.865			
Flt Protected					0.995							0.958	
Satd. Flow (prot)	0	1515	0	0	1663	0	0	1616	0	0	1484	0	
Flt Permitted					0.995							0.958	
Satd. Flow (perm)	0	1515	0	0	1663	0	0	1616	0	0	1484	0	
Link Speed (k/h)	70							40		50			
Link Distance (m)	841.1				852.0			103.0		194.5			
Travel Time (s)	43.3							9.3		14.0			
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%	
Adj. Flow (vph)	1	505	366	45	428	0	192	1	27	0	0	1	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	872	0	0	473	0	0	220	0	0	1	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	3.6							0.0		0.0			
Link Offset(m)	0.0							0.0		0.0			
Crosswalk Width(m)	4.8							4.8		4.8			
Two way Left Turn Lane													
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	
Turning Speed (k/h)	25	15		25	15			25	15	25	15		
Sign Control	Free							Free		Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	84.1%
ICU Level of Service	E
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2036 FT PM
 12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	465	337	41	394	0	177	1	25	0	0	1
Future Volume (Veh/h)	1	465	337	41	394	0	177	1	25	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	505	366	45	428	0	192	1	27	0	0	1
Pedestrians												1
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												0
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	429			871			1209	1209	688	1236	1392	429
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	429			871			1209	1209	688	1236	1392	429
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			0	99	94	100	100	100
cM capacity (veh/h)	1129			774			152	172	446	136	133	625
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	872	473	220	1								
Volume Left	1	45	192	0								
Volume Right	366	0	27	1								
cSH	1129	774	166	625								
Volume to Capacity	0.00	0.06	1.33	0.00								
Queue Length 95th (m)	0.0	1.5	104.8	0.0								
Control Delay (s)	0.0	1.6	236.6	10.8								
Lane LOS	A	A	F	B								
Approach Delay (s)	0.0	1.6	236.6	10.8								
Approach LOS			F	B								
Intersection Summary												
Average Delay			33.8									
Intersection Capacity Utilization			84.1%		ICU Level of Service				E			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2036 FT PM
 12/19/2023






















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (vph)	5	410	79	33	379	0	24	13	41	0	10	20
Future Volume (vph)	5	410	79	33	379	0	24	13	41	0	10	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.929			0.910	
Flt Protected		0.999			0.996			0.985				
Satd. Flow (prot)	0	1549	1473	0	1665	1716	0	1575	0	0	1572	0
Flt Permitted		0.999			0.996			0.985				
Satd. Flow (perm)	0	1549	1473	0	1665	1716	0	1575	0	0	1572	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	13%	1%	1%	5%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	5	446	86	36	412	0	26	14	45	0	11	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	451	86	0	448	0	0	85	0	0	33	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	68.9%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2036 FT PM
 12/19/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	5	410	79	33	379	0	24	13	41	0	10	20	
Future Volume (Veh/h)	5	410	79	33	379	0	24	13	41	0	10	20	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			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	
Hourly flow rate (vph)	5	446	86	36	412	0	26	14	45	0	11	22	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)													
Median type		None					None						
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	412			532			968	940	446	992	1026	412	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	412			532			968	940	446	992	1026	412	
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)													
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	100			97			88	94	93	100	95	97	
cM capacity (veh/h)	1147			1041			212	253	612	194	226	642	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	451	86	448	0	85	33							
Volume Left	5	0	36	0	26	0							
Volume Right	0	86	0	0	45	22							
cSH	1147	1700	1041	1700	338	397							
Volume to Capacity	0.00	0.05	0.03	0.00	0.25	0.08							
Queue Length 95th (m)	0.1	0.0	0.9	0.0	7.8	2.2							
Control Delay (s)	0.1	0.0	1.1	0.0	19.2	14.9							
Lane LOS	A		A		C	B							
Approach Delay (s)	0.1		1.1		19.2	14.9							
Approach LOS					C	B							
Intersection Summary													
Average Delay			2.4										
Intersection Capacity Utilization			68.9%	ICU Level of Service	C								
Analysis Period (min)			15										

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2036 FT PM
12/19/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	8	284	6	6	196	23	7	4	8	31	10	7
Future Volume (vph)	8	284	6	6	196	23	7	4	8	31	10	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.986			0.942			0.980	
Flt Protected		0.999			0.999			0.981			0.969	
Satd. Flow (prot)	0	1725	0	0	1608	0	0	1594	0	0	1633	0
Flt Permitted		0.999			0.999			0.981			0.969	
Satd. Flow (perm)	0	1725	0	0	1608	0	0	1594	0	0	1633	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		827.0			560.6			68.7			892.0	
Travel Time (s)		49.6			33.6			4.9			53.5	
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%	1%	1%	2%	8%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	9	309	7	7	213	25	8	4	9	34	11	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	325	0	0	245	0	0	21	0	0	53	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2036 FT PM
12/19/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	284	6	6	196	23	7	4	8	31	10	7
Future Volume (Veh/h)	8	284	6	6	196	23	7	4	8	31	10	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	9	309	7	7	213	25	8	4	9	34	11	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	238			316			584	582	312	581	574	226
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	238			316			584	582	312	581	574	226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	99	99	92	97	99
cM capacity (veh/h)	1329			1244			409	420	728	413	425	814
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	325	245	21	53								
Volume Left	9	7	8	34								
Volume Right	7	25	9	8								
cSH	1329	1244	506	449								
Volume to Capacity	0.01	0.01	0.04	0.12								
Queue Length 95th (m)	0.2	0.1	1.0	3.2								
Control Delay (s)	0.3	0.3	12.4	14.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.4	14.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			32.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Killaly St. E & Snider Road

2036 FT PM
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	226	1	0	162	34	0	0	0	45	0	10
Future Volume (vph)	5	226	1	0	162	34	0	0	0	45	0	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.999			0.977							0.975
Fl _t Protected		0.999										0.961
Satd. Flow (prot)	0	1712	0	0	1676	0	0	1716	0	0	1608	0
Fl _t Permitted		0.999										0.961
Satd. Flow (perm)	0	1712	0	0	1676	0	0	1716	0	0	1608	0
Link Speed (k/h)		40			60			50				40
Link Distance (m)		835.9			827.0			99.1				923.1
Travel Time (s)		75.2			49.6			7.1				83.1
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
Adj. Flow (vph)	5	246	1	0	176	37	0	0	0	49	0	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	252	0	0	213	0	0	0	0	0	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
5: Killaly St. E & Snider Road

2036 FT PM
12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	226	1	0	162	34	0	0	0	45	0	10
Future Volume (Veh/h)	5	226	1	0	162	34	0	0	0	45	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	246	1	0	176	37	0	0	0	49	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	213			247			462	470	246	451	452	194
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	213			247			462	470	246	451	452	194
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	91	100	99
cM capacity (veh/h)	1357			1319			502	490	792	517	502	847
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	252	213	0	60								
Volume Left	5	0	0	49								
Volume Right	1	37	0	11								
cSH	1357	1319	1700	557								
Volume to Capacity	0.00	0.00	0.00	0.11								
Queue Length 95th (m)	0.1	0.0	0.0	2.9								
Control Delay (s)	0.2	0.0	0.0	12.2								
Lane LOS	A		A	B								
Approach Delay (s)	0.2	0.0	0.0	12.2								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			27.4%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2036 FT PM
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92
Future Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.959			0.986			0.944	
Flt Protected		0.983			0.998			0.992			0.977	
Satd. Flow (prot)	0	1688	0	0	1605	0	0	1693	0	0	1597	0
Flt Permitted		0.983			0.998			0.992			0.977	
Satd. Flow (perm)	0	1688	0	0	1605	0	0	1693	0	0	1597	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	99	180	4	8	166	75	5	22	3	113	27	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	283	0	0	249	0	0	30	0	0	240	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

















Intersection Capacity Utilization 59.4%

ICU Level of Service B

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2036 FT PM
12/19/2023

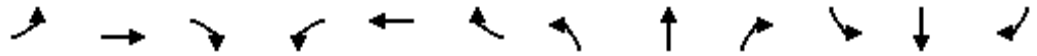
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	166	4	7	153	69	5	20	3	104	25	92
Future Volume (Veh/h)	91	166	4	7	153	69	5	20	3	104	25	92
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	180	4	8	166	75	5	22	3	113	27	100
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	242			184			713	638	185	618	602	204
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242			184			713	638	185	618	602	204
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			99			98	94	100	69	93	88
cM capacity (veh/h)	1317			1397			272	364	855	360	380	835
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	283	249	30	240								
Volume Left	99	8	5	113								
Volume Right	4	75	3	100								
cSH	1317	1397	364	475								
Volume to Capacity	0.08	0.01	0.08	0.50								
Queue Length 95th (m)	1.9	0.1	2.1	22.3								
Control Delay (s)	3.2	0.3	15.8	20.0								
Lane LOS	A	A	C	C								
Approach Delay (s)	3.2	0.3	15.8	20.0								
Approach LOS			C	C								
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			59.4%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings

2036 FT SAT

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	335	194	56	394	202	225	295	42	264	387	165
Future Volume (vph)	199	335	194	56	394	202	225	295	42	264	387	165
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.981				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1699	1403	1662	1683	1390	1646	1629	0	1554	1699	1240
Flt Permitted	0.400			0.475			0.414			0.473		
Satd. Flow (perm)	631	1699	1403	831	1683	1390	717	1629	0	774	1699	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			211			194		10				126
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	3%	6%	0%	4%	7%	1%	6%	1%	7%	3%	20%
Adj. Flow (vph)	216	364	211	61	428	220	245	321	46	287	421	179
Shared Lane Traffic (%)												
Lane Group Flow (vph)	216	364	211	61	428	220	245	367	0	287	421	179
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings
 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

2036 FT SAT
 12/19/2023

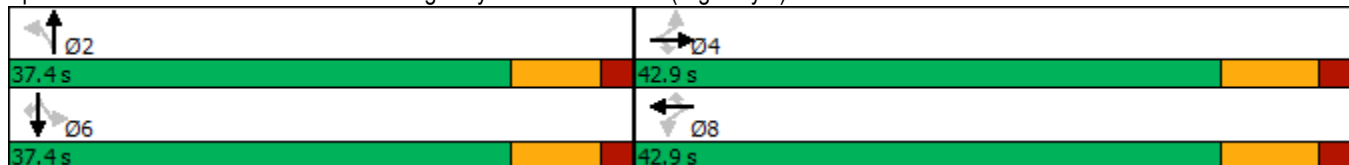


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	28.7	28.7	28.7	28.7	28.7	28.7	30.3	30.3		30.3	30.3	30.3
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39	0.41	0.41		0.41	0.41	0.41
v/c Ratio	0.89	0.56	0.32	0.19	0.66	0.34	0.84	0.55		0.91	0.61	0.31
Control Delay	58.7	21.0	3.6	15.9	23.9	4.8	50.7	21.9		59.7	23.8	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	58.7	21.0	3.6	15.9	23.9	4.8	50.7	21.9		59.7	23.8	7.9
LOS	E	C	A	B	C	A	D	C		E	C	A
Approach Delay		26.7			17.3			33.4			32.2	
Approach LOS		C			B			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 74.5
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 27.5
 Intersection LOS: C
 Intersection Capacity Utilization 96.2%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	216	364	211	61	428	220	245	367	287	421	179
v/c Ratio	0.89	0.56	0.32	0.19	0.66	0.34	0.84	0.55	0.91	0.61	0.31
Control Delay	58.7	21.0	3.6	15.9	23.9	4.8	50.7	21.9	59.7	23.8	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	21.0	3.6	15.9	23.9	4.8	50.7	21.9	59.7	23.8	7.9
Queue Length 50th (m)	28.7	40.5	0.0	5.7	50.2	2.3	35.9	44.3	44.0	54.0	5.3
Queue Length 95th (m)	#68.7	65.0	11.8	13.7	79.4	14.8	#81.8	73.6	#95.8	87.2	19.4
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	300	807	777	394	799	762	291	669	315	691	579
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	0.72	0.45	0.27	0.15	0.54	0.29	0.84	0.55	0.91	0.61	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

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12/19/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	384	305	23	363	0	252	0	24	0	0	0
Future Volume (vph)	0	384	305	23	363	0	252	0	24	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.940						0.988				
Flt Protected					0.997			0.956				
Satd. Flow (prot)	0	1604	0	0	1711	0	0	1621	0	0	1716	0
Flt Permitted					0.997			0.956				
Satd. Flow (perm)	0	1604	0	0	1711	0	0	1621	0	0	1716	0
Link Speed (k/h)		70			80			40			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			9.3			14.0	
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%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	417	332	25	395	0	274	0	26	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	749	0	0	420	0	0	300	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

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

HCM Unsignalized Intersection Capacity Analysis
 2: Snider Road & Main St. E. (Highway 3)

2036 FT SAT
 12/19/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	384	305	23	363	0	252	0	24	0	0	0
Future Volume (Veh/h)	0	384	305	23	363	0	252	0	24	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	417	332	25	395	0	274	0	26	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	395			749			1028	1028	583	1054	1194	395
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	395			749			1028	1028	583	1054	1194	395
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			0	100	95	100	100	100
cM capacity (veh/h)	1164			860			208	227	512	189	181	654
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	749	420	300	0								
Volume Left	0	25	274	0								
Volume Right	332	0	26	0								
cSH	1164	860	219	1700								
Volume to Capacity	0.00	0.03	1.37	0.00								
Queue Length 95th (m)	0.0	0.7	134.6	0.0								
Control Delay (s)	0.0	0.9	235.5	0.0								
Lane LOS		A	F	A								
Approach Delay (s)	0.0	0.9	235.5	0.0								
Approach LOS			F	A								
Intersection Summary												
Average Delay			48.3									
Intersection Capacity Utilization			65.6%		ICU Level of Service				C			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2036 FT SAT
 12/19/2023






















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	5	352	14	24	339	2	23	14	39	0	6	9
Future Volume (vph)	5	352	14	24	339	2	23	14	39	0	6	9
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.931			0.921	
Flt Protected		0.999			0.997			0.985				
Satd. Flow (prot)	0	1698	1473	0	1712	1458	0	1578	0	0	1589	0
Flt Permitted		0.999			0.997			0.985				
Satd. Flow (perm)	0	1698	1473	0	1712	1458	0	1578	0	0	1589	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	3%	1%	1%	2%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	5	383	15	26	368	2	25	15	42	0	7	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	388	15	0	394	2	0	82	0	0	17	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2036 FT SAT
 12/19/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	352	14	24	339	2	23	14	39	0	6	9
Future Volume (Veh/h)	5	352	14	24	339	2	23	14	39	0	6	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	383	15	26	368	2	25	15	42	0	7	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	370			398			826	815	383	862	828	368
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	370			398			826	815	383	862	828	368
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			91	95	94	100	98	99
cM capacity (veh/h)	1189			1166			277	304	664	243	298	680
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	388	15	394	2	82	17						
Volume Left	5	0	26	0	25	0						
Volume Right	0	15	0	2	42	10						
cSH	1189	1700	1166	1700	404	445						
Volume to Capacity	0.00	0.01	0.02	0.00	0.20	0.04						
Queue Length 95th (m)	0.1	0.0	0.5	0.0	6.0	1.0						
Control Delay (s)	0.1	0.0	0.8	0.0	16.2	13.4						
Lane LOS	A		A		C	B						
Approach Delay (s)	0.1		0.8		16.2	13.4						
Approach LOS					C	B						
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			58.9%	ICU Level of Service	B							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2036 FT SAT
12/19/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	225	8	6	137	11	3	2	9	27	7	9
Future Volume (vph)	4	225	8	6	137	11	3	2	9	27	7	9
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.990			0.910			0.971	
Flt Protected		0.999			0.998			0.990			0.970	
Satd. Flow (prot)	0	1722	0	0	1710	0	0	1548	0	0	1619	0
Flt Permitted		0.999			0.998			0.990			0.970	
Satd. Flow (perm)	0	1722	0	0	1710	0	0	1548	0	0	1619	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		827.0			560.6			68.7			892.0	
Travel Time (s)		49.6			33.6			4.9			53.5	
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%	1%	1%	2%	1%	2%	2%	1%	2%	2%	1%	2%
Adj. Flow (vph)	4	245	9	7	149	12	3	2	10	29	8	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	258	0	0	168	0	0	15	0	0	47	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2036 FT SAT
12/19/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	225	8	6	137	11	3	2	9	27	7	9
Future Volume (Veh/h)	4	225	8	6	137	11	3	2	9	27	7	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	4	245	9	7	149	12	3	2	10	29	8	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	161			254			440	432	250	438	431	155
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	161			254			440	432	250	438	431	155
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	99	94	98	99
cM capacity (veh/h)	1418			1311			512	513	789	518	514	891
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	258	168	15	47								
Volume Left	4	7	3	29								
Volume Right	9	12	10	10								
cSH	1418	1311	669	568								
Volume to Capacity	0.00	0.01	0.02	0.08								
Queue Length 95th (m)	0.1	0.1	0.6	2.2								
Control Delay (s)	0.1	0.4	10.5	11.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.4	10.5	11.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			28.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Killaly St. E & Snider Road

2036 FT SAT
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	14	182	2	0	148	18	0	0	0	35	0	17
Future Volume (vph)	14	182	2	0	148	18	0	0	0	35	0	17
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.985							0.957
Flt Protected		0.997										0.967
Satd. Flow (prot)	0	1709	0	0	1690	0	0	1716	0	0	1588	0
Flt Permitted		0.997										0.967
Satd. Flow (perm)	0	1709	0	0	1690	0	0	1716	0	0	1588	0
Link Speed (k/h)		40			60			50				40
Link Distance (m)		835.9			827.0			99.1				923.1
Travel Time (s)		75.2			49.6			7.1				83.1
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
Adj. Flow (vph)	15	198	2	0	161	20	0	0	0	38	0	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	215	0	0	181	0	0	0	0	0	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
5: Killaly St. E & Snider Road

2036 FT SAT
12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	14	182	2	0	148	18	0	0	0	35	0	17
Future Volume (Veh/h)	14	182	2	0	148	18	0	0	0	35	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	15	198	2	0	161	20	0	0	0	38	0	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	181			200			418	410	199	400	401	171
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	181			200			418	410	199	400	401	171
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	93	100	98
cM capacity (veh/h)	1394			1372			530	526	842	556	532	873
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	215	181	0	56								
Volume Left	15	0	0	38								
Volume Right	2	20	0	18								
cSH	1394	1372	1700	629								
Volume to Capacity	0.01	0.00	0.00	0.09								
Queue Length 95th (m)	0.3	0.0	0.0	2.3								
Control Delay (s)	0.6	0.0	0.0	11.3								
Lane LOS	A		A	B								
Approach Delay (s)	0.6	0.0	0.0	11.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			33.1%	ICU Level of Service		A						
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2036 FT SAT
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
Future Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.957			0.984			0.950	
Flt Protected		0.984			0.999			0.997			0.973	
Satd. Flow (prot)	0	1616	0	0	1656	0	0	1698	0	0	1600	0
Flt Permitted		0.984			0.999			0.997			0.973	
Satd. Flow (perm)	0	1616	0	0	1656	0	0	1698	0	0	1600	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)									3	3		
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 (%)	1%	9%	2%	2%	1%	1%	1%	1%	2%	1%	2%	1%
Adj. Flow (vph)	86	180	4	7	190	92	2	27	4	165	25	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	0	0	289	0	0	33	0	0	301	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.4%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2036 FT SAT
12/19/2023



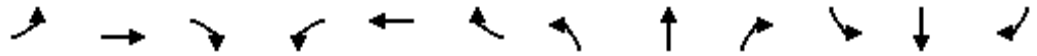
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	79	166	4	6	175	85	2	25	4	152	23	102
Future Volume (Veh/h)	79	166	4	6	175	85	2	25	4	152	23	102
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	86	180	4	7	190	92	2	27	4	165	25	111
Pedestrians					3							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	282			184			728	650	185	624	606	236
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	282			184			728	650	185	624	606	236
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			99	93	100	53	93	86
cM capacity (veh/h)	1286			1391			264	362	855	353	382	805
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	270	289	33	301								
Volume Left	86	7	2	165								
Volume Right	4	92	4	111								
cSH	1286	1391	380	449								
Volume to Capacity	0.07	0.01	0.09	0.67								
Queue Length 95th (m)	1.7	0.1	2.3	38.7								
Control Delay (s)	3.0	0.2	15.4	27.8								
Lane LOS	A	A	C	D								
Approach Delay (s)	3.0	0.2	15.4	27.8								
Approach LOS			C	D								
Intersection Summary												
Average Delay			10.9									
Intersection Capacity Utilization			64.4%		ICU Level of Service				C			
Analysis Period (min)			15									

APPENDIX O

2041 Future Total Detailed Capacity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	244	138	74	462	248	188	274	38	109	179	196
Future Volume (vph)	171	244	138	74	462	248	188	274	38	109	179	196
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.98						
Frt			0.850			0.850		0.982				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1403	1630	1471	1390	1646	1631	0	1554	1716	1240
Flt Permitted	0.328			0.596			0.635			0.496		
Satd. Flow (perm)	516	1535	1403	1023	1471	1368	1100	1631	0	811	1716	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			203		10				213
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
Confl. Peds. (#/hr)	4					4						
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 (%)	11%	14%	6%	2%	19%	7%	1%	6%	1%	7%	2%	20%
Adj. Flow (vph)	186	265	150	80	502	270	204	298	41	118	195	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	265	150	80	502	270	204	339	0	118	195	213
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

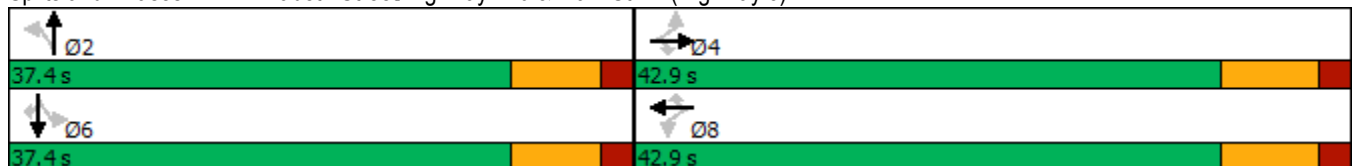


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	30.7	30.7	30.7	30.7	30.7	30.7	30.2	30.2		30.2	30.2	30.2
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		0.40	0.40	0.40
v/c Ratio	0.90	0.43	0.23	0.19	0.85	0.40	0.47	0.52		0.37	0.29	0.34
Control Delay	65.5	18.6	3.6	15.6	35.6	6.3	23.0	21.8		22.3	18.5	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	65.5	18.6	3.6	15.6	35.6	6.3	23.0	21.8		22.3	18.5	4.5
LOS	E	B	A	B	D	A	C	C		C	B	A
Approach Delay		29.3			24.4			22.2			13.7	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 76.3
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 22.9
 Intersection Capacity Utilization 90.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

2041 FT AM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	265	150	80	502	270	204	339	118	195	213
v/c Ratio	0.90	0.43	0.23	0.19	0.85	0.40	0.47	0.52	0.37	0.29	0.34
Control Delay	65.5	18.6	3.6	15.6	35.6	6.3	23.0	21.8	22.3	18.5	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	18.6	3.6	15.6	35.6	6.3	23.0	21.8	22.3	18.5	4.5
Queue Length 50th (m)	25.4	28.0	0.0	7.6	66.5	6.2	24.7	40.7	13.6	21.7	0.0
Queue Length 95th (m)	#64.3	47.2	10.1	16.7	#119.9	21.4	45.4	67.0	28.7	37.9	13.6
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	238	708	728	471	679	740	434	651	320	679	619
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	0.78	0.37	0.21	0.17	0.74	0.36	0.47	0.52	0.37	0.29	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FT AM
12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	318	74	5	468	0	289	0	5	0	0	2
Future Volume (vph)	1	318	74	5	468	0	289	0	5	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975						0.998			0.865	
Flt Protected								0.953				
Satd. Flow (prot)	0	1453	0	0	1391	0	0	1632	0	0	1484	0
Flt Permitted								0.953				
Satd. Flow (perm)	0	1453	0	0	1391	0	0	1632	0	0	1484	0
Link Speed (k/h)		70			80			40			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			9.3			14.0	
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%	21%	2%	2%	26%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	346	80	5	509	0	314	0	5	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	427	0	0	514	0	0	319	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.8%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2041 FT AM
12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	318	74	5	468	0	289	0	5	0	0	2
Future Volume (Veh/h)	1	318	74	5	468	0	289	0	5	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	346	80	5	509	0	314	0	5	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	509			426			909	907	386	912	947	509
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	509			426			909	907	386	912	947	509
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			0	100	99	100	100	100
cM capacity (veh/h)	1056			1133			254	274	662	252	260	564
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	427	514	319	2								
Volume Left	1	5	314	0								
Volume Right	80	0	5	2								
cSH	1056	1133	256	564								
Volume to Capacity	0.00	0.00	1.24	0.00								
Queue Length 95th (m)	0.0	0.1	124.3	0.1								
Control Delay (s)	0.0	0.1	178.4	11.4								
Lane LOS	A	A	F	B								
Approach Delay (s)	0.0	0.1	178.4	11.4								
Approach LOS			F	B								
Intersection Summary												
Average Delay			45.2									
Intersection Capacity Utilization			61.8%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FT AM
 12/18/2023






















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	5	305	21	11	414	0	38	9	21	0	2	2
Future Volume (vph)	5	305	21	11	414	0	38	9	21	0	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.958			0.932	
Flt Protected		0.999			0.999			0.973				
Satd. Flow (prot)	0	1460	1473	0	1417	1716	0	1608	0	0	1607	0
Flt Permitted		0.999			0.999			0.973				
Satd. Flow (perm)	0	1460	1473	0	1417	1716	0	1608	0	0	1607	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	20%	1%	1%	24%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	5	332	23	12	450	0	41	10	23	0	2	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	337	23	0	462	0	0	74	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.8%
ICU Level of Service	A
Analysis Period (min)	15

















HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FT AM
 12/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	305	21	11	414	0	38	9	21	0	2	2
Future Volume (Veh/h)	5	305	21	11	414	0	38	9	21	0	2	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	332	23	12	450	0	41	10	23	0	2	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None					None					
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	450			355			819	816	332	844	839	450
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	450			355			819	816	332	844	839	450
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			86	97	97	100	99	100
cM capacity (veh/h)	1110			1209			290	307	710	264	298	611
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	337	23	462	0	74	4						
Volume Left	5	0	12	0	41	0						
Volume Right	0	23	0	0	23	2						
cSH	1110	1700	1209	1700	358	400						
Volume to Capacity	0.00	0.01	0.01	0.00	0.21	0.01						
Queue Length 95th (m)	0.1	0.0	0.2	0.0	6.1	0.2						
Control Delay (s)	0.2	0.0	0.3	0.0	17.6	14.1						
Lane LOS	A		A		C	B						
Approach Delay (s)	0.2		0.3		17.6	14.1						
Approach LOS					C	B						
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			50.8%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2041 FT AM
12/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	131	6	7	103	6	5	5	4	12	4	3
Future Volume (vph)	3	131	6	7	103	6	5	5	4	12	4	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.993			0.961			0.980	
Flt Protected		0.999			0.997			0.982			0.969	
Satd. Flow (prot)	0	1659	0	0	1602	0	0	1625	0	0	1632	0
Flt Permitted		0.999			0.997			0.982			0.969	
Satd. Flow (perm)	0	1659	0	0	1602	0	0	1625	0	0	1632	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		827.0			560.6			68.7			892.0	
Travel Time (s)		49.6			33.6			4.9			53.5	
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%	5%	1%	2%	9%	2%	2%	1%	2%	2%	1%	2%
Adj. Flow (vph)	3	142	7	8	112	7	5	5	4	13	4	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	152	0	0	127	0	0	14	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2041 FT AM
12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	3	131	6	7	103	6	5	5	4	12	4	3
Future Volume (Veh/h)	3	131	6	7	103	6	5	5	4	12	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	3	142	7	8	112	7	5	5	4	13	4	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	119			149			288	286	146	290	286	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	119			149			288	286	146	290	286	116
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	99	100	98	99	100
cM capacity (veh/h)	1469			1432			655	620	902	652	620	937
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	152	127	14	20								
Volume Left	3	8	5	13								
Volume Right	7	7	4	3								
cSH	1469	1432	695	676								
Volume to Capacity	0.00	0.01	0.02	0.03								
Queue Length 95th (m)	0.0	0.1	0.5	0.7								
Control Delay (s)	0.2	0.5	10.3	10.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	10.3	10.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			20.2%	ICU Level of Service		A						
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Killaly St. E & Snider Road

2041 FT AM
12/18/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	29	200	3	0	204	6	0	0	0	15	0	52
Future Volume (vph)	29	200	3	0	204	6	0	0	0	15	0	52
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.996						0.895	
Flt Protected		0.994									0.989	
Satd. Flow (prot)	0	1702	0	0	1709	0	0	1716	0	0	1519	0
Flt Permitted		0.994									0.989	
Satd. Flow (perm)	0	1702	0	0	1709	0	0	1716	0	0	1519	0
Link Speed (k/h)		40			60			50			40	
Link Distance (m)		835.9			827.0			99.1			923.1	
Travel Time (s)		75.2			49.6			7.1			83.1	
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
Adj. Flow (vph)	32	217	3	0	222	7	0	0	0	16	0	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	252	0	0	229	0	0	0	0	0	73	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
5: Killaly St. E & Snider Road

2041 FT AM
12/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	200	3	0	204	6	0	0	0	15	0	52
Future Volume (Veh/h)	29	200	3	0	204	6	0	0	0	15	0	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	32	217	3	0	222	7	0	0	0	16	0	57
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	229			220			565	512	218	508	510	226
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229			220			565	512	218	508	510	226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	97	100	93
cM capacity (veh/h)	1339			1349			398	455	821	467	456	814
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	252	229	0	73								
Volume Left	32	0	0	16								
Volume Right	3	7	0	57								
cSH	1339	1349	1700	700								
Volume to Capacity	0.02	0.00	0.00	0.10								
Queue Length 95th (m)	0.6	0.0	0.0	2.8								
Control Delay (s)	1.2	0.0	0.0	10.7								
Lane LOS	A		A	B								
Approach Delay (s)	1.2	0.0	0.0	10.7								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			39.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2041 FT AM
12/18/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
Future Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.979			0.966			0.919	
Flt Protected		0.985						0.996			0.985	
Satd. Flow (prot)	0	1600	0	0	1514	0	0	1663	0	0	1562	0
Flt Permitted		0.985						0.996			0.985	
Satd. Flow (perm)	0	1600	0	0	1514	0	0	1663	0	0	1562	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		1	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 (%)	4%	9%	2%	2%	15%	4%	1%	1%	2%	2%	2%	1%
Adj. Flow (vph)	108	250	7	3	361	68	3	27	10	66	20	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	365	0	0	432	0	0	40	0	0	215	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

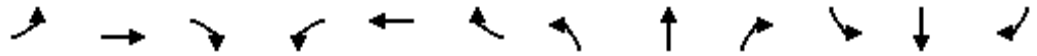
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.1%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

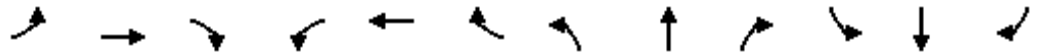
2041 FT AM
12/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	99	230	6	3	332	63	3	25	9	61	18	119
Future Volume (Veh/h)	99	230	6	3	332	63	3	25	9	61	18	119
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	108	250	7	3	361	68	3	27	10	66	20	129
Pedestrians					1						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	430			257			1010	906	254	896	875	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	430			257			1010	906	254	896	875	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			98	89	99	70	92	80
cM capacity (veh/h)	1118			1308			153	250	783	218	259	655
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	365	432	40	215								
Volume Left	108	3	3	66								
Volume Right	7	68	10	129								
cSH	1118	1308	285	373								
Volume to Capacity	0.10	0.00	0.14	0.58								
Queue Length 95th (m)	2.6	0.1	3.9	27.8								
Control Delay (s)	3.2	0.1	19.7	27.0								
Lane LOS	A	A	C	D								
Approach Delay (s)	3.2	0.1	19.7	27.0								
Approach LOS			C	D								
Intersection Summary												
Average Delay			7.4									
Intersection Capacity Utilization			72.1%		ICU Level of Service					C		
Analysis Period (min)			15									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	297	398	111	33	402	220	90	303	37	422	508	376
Future Volume (vph)	297	398	111	33	402	220	90	303	37	422	508	376
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.984				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1675	0	1614	1716	1352
Flt Permitted	0.277			0.511			0.162			0.403		
Satd. Flow (perm)	437	1535	1365	877	1683	1473	278	1675	0	685	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112			170		8				203
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	323	433	121	36	437	239	98	329	40	459	552	409
Shared Lane Traffic (%)												
Lane Group Flow (vph)	323	433	121	36	437	239	98	369	0	459	552	409
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	7	4			8			2				6

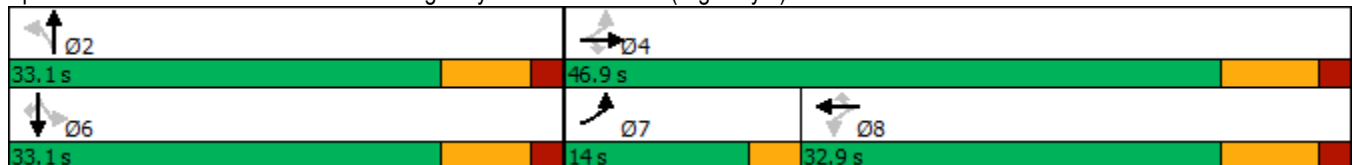


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	7	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	11.1	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	14.0	46.9	46.9	32.9	32.9	32.9	33.1	33.1		33.1	33.1	33.1
Total Split (%)	17.5%	58.6%	58.6%	41.1%	41.1%	41.1%	41.4%	41.4%		41.4%	41.4%	41.4%
Maximum Green (s)	11.0	39.0	39.0	25.0	25.0	25.0	25.7	25.7		25.7	25.7	25.7
Yellow Time (s)	3.0	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	0.0	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		0.0	0.0	0.0
Total Lost Time (s)	3.0	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max	Max	Max	Max	Max	Min	Min		Min	Min	Min
Walk Time (s)		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	43.9	39.0	39.0	25.0	25.0	25.0	25.7	25.7		25.7	25.7	25.7
Actuated g/C Ratio	0.55	0.49	0.49	0.31	0.31	0.31	0.32	0.32		0.32	0.32	0.32
v/c Ratio	0.84	0.58	0.17	0.13	0.83	0.41	1.10	0.68		2.09	1.00	0.72
Control Delay	33.0	18.5	3.5	21.4	41.5	9.5	158.4	30.5		525.3	68.5	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	33.0	18.5	3.5	21.4	41.5	9.5	158.4	30.5		525.3	68.5	19.9
LOS	C	B	A	C	D	A	F	C		F	E	B
Approach Delay		21.8			29.7			57.4			202.1	
Approach LOS		C			C			E			F	

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Natural Cycle: 90
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 2.09
 Intersection Signal Delay: 101.9
 Intersection Capacity Utilization 108.2%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	323	433	121	36	437	239	98	369	459	552	409
v/c Ratio	0.84	0.58	0.17	0.13	0.83	0.41	1.10	0.68	2.09	1.00	0.72
Control Delay	33.0	18.5	3.5	21.4	41.5	9.5	158.4	30.5	525.3	68.5	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	18.5	3.5	21.4	41.5	9.5	158.4	30.5	525.3	68.5	19.9
Queue Length 50th (m)	27.6	47.0	0.7	4.1	64.3	7.9	~18.0	49.6	~118.0	~87.6	27.9
Queue Length 95th (m)	#63.7	76.0	9.0	11.2	#114.3	25.9	#47.8	80.2	#174.4	#153.6	63.2
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	385	748	722	274	525	577	89	543	220	551	572
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	0.84	0.58	0.17	0.13	0.83	0.41	1.10	0.68	2.09	1.00	0.72

Intersection Summary

~ 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.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FT PM
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	517	337	41	444	0	177	1	25	0	0	1
Future Volume (vph)	1	517	337	41	444	0	177	1	25	0	0	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.947						0.983			0.865		
Flt Protected				0.996			0.958					
Satd. Flow (prot)	0	1517	0	0	1664	0	0	1616	0	0	1484	0
Flt Permitted				0.996			0.958					
Satd. Flow (perm)	0	1517	0	0	1664	0	0	1616	0	0	1484	0
Link Speed (k/h)	70			80			40			50		
Link Distance (m)	841.1			852.0			103.0			194.5		
Travel Time (s)	43.3			38.3			9.3			14.0		
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	562	366	45	483	0	192	1	27	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	929	0	0	528	0	0	220	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6			3.6			0.0			0.0		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.8			4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		25	15		25	15		25	15	
Sign Control	Free			Free			Stop			Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	86.8%
ICU Level of Service	E
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2041 FT PM
12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	517	337	41	444	0	177	1	25	0	0	1
Future Volume (Veh/h)	1	517	337	41	444	0	177	1	25	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	562	366	45	483	0	192	1	27	0	0	1
Pedestrians												1
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												0
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	484			928			1321	1321	745	1348	1504	484
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	484			928			1321	1321	745	1348	1504	484
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			0	99	93	100	100	100
cM capacity (veh/h)	1078			737			127	147	414	113	114	582
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	929	528	220	1								
Volume Left	1	45	192	0								
Volume Right	366	0	27	1								
cSH	1078	737	139	582								
Volume to Capacity	0.00	0.06	1.58	0.00								
Queue Length 95th (m)	0.0	1.6	123.8	0.0								
Control Delay (s)	0.0	1.7	351.3	11.2								
Lane LOS	A	A	F	B								
Approach Delay (s)	0.0	1.7	351.3	11.2								
Approach LOS			F	B								
Intersection Summary												
Average Delay			46.6									
Intersection Capacity Utilization			86.8%		ICU Level of Service				E			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FT PM
 12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	5	459	79	33	426	0	24	13	41	0	10	20
Future Volume (vph)	5	459	79	33	426	0	24	13	41	0	10	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.929			0.910	
Flt Protected					0.996			0.985				
Satd. Flow (prot)	0	1550	1473	0	1665	1716	0	1575	0	0	1572	0
Flt Permitted					0.996			0.985				
Satd. Flow (perm)	0	1550	1473	0	1665	1716	0	1575	0	0	1572	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	13%	1%	1%	5%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	5	499	86	36	463	0	26	14	45	0	11	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	504	86	0	499	0	0	85	0	0	33	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.1%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FT PM
 12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	
Traffic Volume (veh/h)	5	459	79	33	426	0	24	13	41	0	10	20
Future Volume (Veh/h)	5	459	79	33	426	0	24	13	41	0	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	499	86	36	463	0	26	14	45	0	11	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	463			585			1072	1044	499	1096	1130	463
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	463			585			1072	1044	499	1096	1130	463
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			85	94	92	100	94	96
cM capacity (veh/h)	1098			995			178	220	572	162	195	601
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	504	86	499	0	85	33						
Volume Left	5	0	36	0	26	0						
Volume Right	0	86	0	0	45	22						
cSH	1098	1700	995	1700	295	355						
Volume to Capacity	0.00	0.05	0.04	0.00	0.29	0.09						
Queue Length 95th (m)	0.1	0.0	0.9	0.0	9.3	2.4						
Control Delay (s)	0.1	0.0	1.0	0.0	22.1	16.2						
Lane LOS	A		A		C	C						
Approach Delay (s)	0.1		1.0		22.1	16.2						
Approach LOS					C	C						
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			72.1%	ICU Level of Service	C							
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

2041 FT PM
12/19/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	8	284	6	6	196	23	7	4	8	31	10	7
Future Volume (vph)	8	284	6	6	196	23	7	4	8	31	10	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.986			0.942			0.980	
Flt Protected		0.999			0.999			0.981			0.969	
Satd. Flow (prot)	0	1725	0	0	1608	0	0	1594	0	0	1633	0
Flt Permitted		0.999			0.999			0.981			0.969	
Satd. Flow (perm)	0	1725	0	0	1608	0	0	1594	0	0	1633	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		827.0			560.6			68.7			892.0	
Travel Time (s)		49.6			33.6			4.9			53.5	
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%	1%	1%	2%	8%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	9	309	7	7	213	25	8	4	9	34	11	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	325	0	0	245	0	0	21	0	0	53	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2041 FT PM
12/19/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	284	6	6	196	23	7	4	8	31	10	7
Future Volume (Veh/h)	8	284	6	6	196	23	7	4	8	31	10	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	9	309	7	7	213	25	8	4	9	34	11	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	238			316			584	582	312	581	574	226
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	238			316			584	582	312	581	574	226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	99	99	92	97	99
cM capacity (veh/h)	1329			1244			409	420	728	413	425	814
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	325	245	21	53								
Volume Left	9	7	8	34								
Volume Right	7	25	9	8								
cSH	1329	1244	506	449								
Volume to Capacity	0.01	0.01	0.04	0.12								
Queue Length 95th (m)	0.2	0.1	1.0	3.2								
Control Delay (s)	0.3	0.3	12.4	14.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.4	14.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			32.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Killaly St. E & Snider Road

2041 FT PM
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	226	1	0	162	34	0	0	0	45	0	10
Future Volume (vph)	5	226	1	0	162	34	0	0	0	45	0	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.999			0.977							0.975
Fl _t Protected		0.999										0.961
Satd. Flow (prot)	0	1712	0	0	1676	0	0	1716	0	0	1608	0
Fl _t Permitted		0.999										0.961
Satd. Flow (perm)	0	1712	0	0	1676	0	0	1716	0	0	1608	0
Link Speed (k/h)		40			60			50			40	
Link Distance (m)		835.9			827.0			99.1			923.1	
Travel Time (s)		75.2			49.6			7.1			83.1	
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
Adj. Flow (vph)	5	246	1	0	176	37	0	0	0	49	0	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	252	0	0	213	0	0	0	0	0	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
5: Killaly St. E & Snider Road

2041 FT PM
12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	226	1	0	162	34	0	0	0	45	0	10
Future Volume (Veh/h)	5	226	1	0	162	34	0	0	0	45	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	246	1	0	176	37	0	0	0	49	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	213			247			462	470	246	451	452	194
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	213			247			462	470	246	451	452	194
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	91	100	99
cM capacity (veh/h)	1357			1319			502	490	792	517	502	847
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	252	213	0	60								
Volume Left	5	0	0	49								
Volume Right	1	37	0	11								
cSH	1357	1319	1700	557								
Volume to Capacity	0.00	0.00	0.00	0.11								
Queue Length 95th (m)	0.1	0.0	0.0	2.9								
Control Delay (s)	0.2	0.0	0.0	12.2								
Lane LOS	A		A	B								
Approach Delay (s)	0.2	0.0	0.0	12.2								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			27.4%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2041 FT PM
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92
Future Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.959			0.986			0.944	
Flt Protected		0.983			0.998			0.992			0.977	
Satd. Flow (prot)	0	1688	0	0	1605	0	0	1693	0	0	1597	0
Flt Permitted		0.983			0.998			0.992			0.977	
Satd. Flow (perm)	0	1688	0	0	1605	0	0	1693	0	0	1597	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1					1			3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	99	180	4	8	166	75	5	22	3	113	27	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	283	0	0	249	0	0	30	0	0	240	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	59.4%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2041 FT PM
12/19/2023



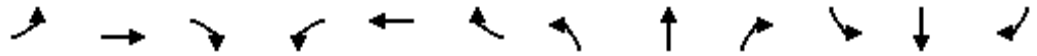
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	91	166	4	7	153	69	5	20	3	104	25	92
Future Volume (Veh/h)	91	166	4	7	153	69	5	20	3	104	25	92
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	180	4	8	166	75	5	22	3	113	27	100
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	242			184			713	638	185	618	602	204
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242			184			713	638	185	618	602	204
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			99			98	94	100	69	93	88
cM capacity (veh/h)	1317			1397			272	364	855	360	380	835
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	283	249	30	240								
Volume Left	99	8	5	113								
Volume Right	4	75	3	100								
cSH	1317	1397	364	475								
Volume to Capacity	0.08	0.01	0.08	0.50								
Queue Length 95th (m)	1.9	0.1	2.1	22.3								
Control Delay (s)	3.2	0.3	15.8	20.0								
Lane LOS	A	A	C	C								
Approach Delay (s)	3.2	0.3	15.8	20.0								
Approach LOS			C	C								
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			59.4%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings

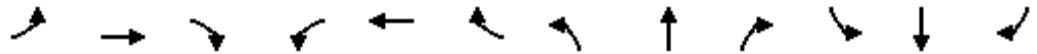
2041 FT SAT

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	363	204	63	429	209	225	295	42	266	394	179
Future Volume (vph)	225	363	204	63	429	209	225	295	42	266	394	179
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.981				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1662	1683	1473	1630	1671	0	1614	1716	1352
Flt Permitted	0.376			0.451			0.382			0.453		
Satd. Flow (perm)	593	1535	1365	789	1683	1473	655	1671	0	770	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			222			184		10				135
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	0%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	245	395	222	68	466	227	245	321	46	289	428	195
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	395	222	68	466	227	245	367	0	289	428	195
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

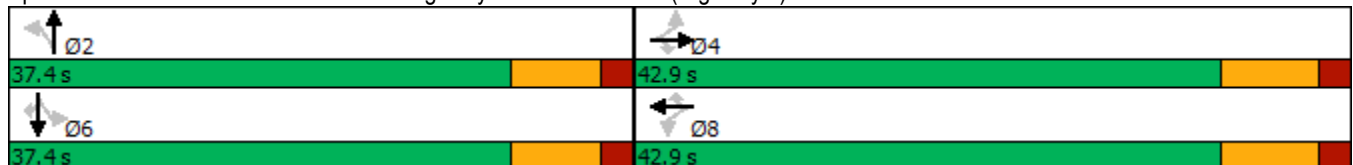


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		32.4	32.4	32.4
Total Split (s)	42.9	42.9	42.9	42.9	42.9	42.9	37.4	37.4		37.4	37.4	37.4
Total Split (%)	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%		46.6%	46.6%	46.6%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	30.0
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		5.4	5.4	5.4
All-Red Time (s)	2.0	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		0.0	0.0	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max		Max	Max	Max
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	33.0	33.0	33.0	33.0	33.0	33.0	30.1	30.1		30.1	30.1	30.1
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.38	0.38		0.38	0.38	0.38
v/c Ratio	0.98	0.61	0.32	0.21	0.66	0.31	0.98	0.57		0.98	0.65	0.32
Control Delay	79.5	22.4	3.5	16.1	23.4	5.1	80.6	23.3		76.5	26.1	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	79.5	22.4	3.5	16.1	23.4	5.1	80.6	23.3		76.5	26.1	8.0
LOS	E	C	A	B	C	A	F	C		E	C	A
Approach Delay		33.8			17.3			46.3			38.2	
Approach LOS		C			B			D			D	

Intersection Summary

Area Type: Other
 Cycle Length: 80.3
 Actuated Cycle Length: 78.4
 Natural Cycle: 80
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 33.5
 Intersection LOS: C
 Intersection Capacity Utilization 99.6%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	245	395	222	68	466	227	245	367	289	428	195
v/c Ratio	0.98	0.61	0.32	0.21	0.66	0.31	0.98	0.57	0.98	0.65	0.32
Control Delay	79.5	22.4	3.5	16.1	23.4	5.1	80.6	23.3	76.5	26.1	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	22.4	3.5	16.1	23.4	5.1	80.6	23.3	76.5	26.1	8.0
Queue Length 50th (m)	36.5	46.5	0.0	6.5	56.3	3.9	~38.7	44.9	~45.9	56.2	6.2
Queue Length 95th (m)	#83.4	75.5	12.0	15.3	88.8	16.8	#85.7	72.7	#96.4	88.6	20.6
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	265	687	733	352	753	760	251	647	295	658	601
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	0.92	0.57	0.30	0.19	0.62	0.30	0.98	0.57	0.98	0.65	0.32

Intersection Summary

~ 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.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FT SAT
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	0	427	305	23	408	0	252	0	24	0	0	0
Future Volume (vph)	0	427	305	23	408	0	252	0	24	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.944						0.988					
Flt Protected							0.997			0.956		
Satd. Flow (prot)	0	1516	0	0	1664	0	0	1621	0	0	1716	0
Flt Permitted							0.997			0.956		
Satd. Flow (perm)	0	1516	0	0	1664	0	0	1621	0	0	1716	0
Link Speed (k/h)	70						80			40		
Link Distance (m)	841.1						852.0			103.0		
Travel Time (s)	43.3						38.3			9.3		
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	464	332	25	443	0	274	0	26	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	796	0	0	468	0	0	300	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6						3.6			0.0		
Link Offset(m)	0.0						0.0			0.0		
Crosswalk Width(m)	4.8						4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15		25		15		25		15	
Sign Control	Free						Free			Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	68.0%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Snider Road & Main St. E. (Highway 3)

2041 FT SAT
12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	0	427	305	23	408	0	252	0	24	0	0	0
Future Volume (Veh/h)	0	427	305	23	408	0	252	0	24	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	464	332	25	443	0	274	0	26	0	0	0
Pedestrians												1
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												0
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	444			796			1123	1124	630	1150	1290	444
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	444			796			1123	1124	630	1150	1290	444
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			0	100	95	100	100	100
cM capacity (veh/h)	1115			826			179	199	482	162	158	613
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	796	468	300	0								
Volume Left	0	25	274	0								
Volume Right	332	0	26	0								
cSH	1115	826	189	1700								
Volume to Capacity	0.00	0.03	1.59	0.00								
Queue Length 95th (m)	0.0	0.7	157.0	0.0								
Control Delay (s)	0.0	0.9	333.1	0.0								
Lane LOS		A	F	A								
Approach Delay (s)	0.0	0.9	333.1	0.0								
Approach LOS			F	A								
Intersection Summary												
Average Delay			64.2									
Intersection Capacity Utilization			68.0%		ICU Level of Service				C			
Analysis Period (min)			15									

Lanes, Volumes, Timings
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FT SAT
 12/19/2023






















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↖	↗		↕			↕	
Traffic Volume (vph)	5	393	14	24	382	2	23	14	39	0	6	9
Future Volume (vph)	5	393	14	24	382	2	23	14	39	0	6	9
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		1.0	0.0		1.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		1	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.931			0.921	
Flt Protected		0.999			0.997			0.985				
Satd. Flow (prot)	0	1549	1473	0	1665	1458	0	1578	0	0	1589	0
Flt Permitted		0.999			0.997			0.985				
Satd. Flow (perm)	0	1549	1473	0	1665	1458	0	1578	0	0	1589	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		852.0			356.6			892.0			219.0	
Travel Time (s)		38.3			16.0			53.5			15.8	
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%	13%	1%	1%	5%	2%	1%	2%	2%	2%	2%	1%
Adj. Flow (vph)	5	427	15	26	415	2	25	15	42	0	7	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	432	15	0	441	2	0	82	0	0	17	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.3%
ICU Level of Service	B
Analysis Period (min)	15

















HCM Unsignalized Intersection Capacity Analysis
 3: Lorraine Road/Babion Road & Main St. E. (Highway 3)

2041 FT SAT
 12/19/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	393	14	24	382	2	23	14	39	0	6	9
Future Volume (Veh/h)	5	393	14	24	382	2	23	14	39	0	6	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	5	427	15	26	415	2	25	15	42	0	7	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	417			442			918	906	427	954	919	415
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	417			442			918	906	427	954	919	415
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	94	93	100	97	98
cM capacity (veh/h)	1142			1123			239	268	628	209	264	640
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	432	15	441	2	82	17						
Volume Left	5	0	26	0	25	0						
Volume Right	0	15	0	2	42	10						
cSH	1142	1700	1123	1700	361	403						
Volume to Capacity	0.00	0.01	0.02	0.00	0.23	0.04						
Queue Length 95th (m)	0.1	0.0	0.6	0.0	6.9	1.1						
Control Delay (s)	0.1	0.0	0.7	0.0	17.9	14.3						
Lane LOS	A		A		C	B						
Approach Delay (s)	0.1		0.7		17.9	14.3						
Approach LOS					C	B						
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			61.3%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Killaly St. E & Lorraine Road

















2041 FT SAT
12/19/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	225	8	6	137	11	3	2	9	27	7	9
Future Volume (vph)	4	225	8	6	137	11	3	2	9	27	7	9
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.990			0.910			0.971	
Flt Protected		0.999			0.998			0.990			0.970	
Satd. Flow (prot)	0	1722	0	0	1611	0	0	1551	0	0	1619	0
Flt Permitted		0.999			0.998			0.990			0.970	
Satd. Flow (perm)	0	1722	0	0	1611	0	0	1551	0	0	1619	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		827.0			560.6			68.7			892.0	
Travel Time (s)		49.6			33.6			4.9			53.5	
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%	1%	1%	2%	8%	2%	1%	1%	2%	2%	1%	2%
Adj. Flow (vph)	4	245	9	7	149	12	3	2	10	29	8	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	258	0	0	168	0	0	15	0	0	47	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			-20.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
4: Killaly St. E & Lorraine Road

2041 FT SAT
12/19/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	225	8	6	137	11	3	2	9	27	7	9
Future Volume (Veh/h)	4	225	8	6	137	11	3	2	9	27	7	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	4	245	9	7	149	12	3	2	10	29	8	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	161			254			440	432	250	438	431	155
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	161			254			440	432	250	438	431	155
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	99	94	98	99
cM capacity (veh/h)	1418			1311			513	513	789	518	514	891
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	258	168	15	47								
Volume Left	4	7	3	29								
Volume Right	9	12	10	10								
cSH	1418	1311	669	568								
Volume to Capacity	0.00	0.01	0.02	0.08								
Queue Length 95th (m)	0.1	0.1	0.5	2.2								
Control Delay (s)	0.1	0.4	10.5	11.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.4	10.5	11.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			28.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Killaly St. E & Snider Road

2041 FT SAT
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	14	182	2	0	148	18	0	0	0	35	0	17
Future Volume (vph)	14	182	2	0	148	18	0	0	0	35	0	17
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.985							0.957
Flt Protected		0.997										0.967
Satd. Flow (prot)	0	1709	0	0	1690	0	0	1716	0	0	1588	0
Flt Permitted		0.997										0.967
Satd. Flow (perm)	0	1709	0	0	1690	0	0	1716	0	0	1588	0
Link Speed (k/h)		40			60			50				40
Link Distance (m)		835.9			827.0			99.1				923.1
Travel Time (s)		75.2			49.6			7.1				83.1
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
Adj. Flow (vph)	15	198	2	0	161	20	0	0	0	38	0	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	215	0	0	181	0	0	0	0	0	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
5: Killaly St. E & Snider Road

2041 FT SAT
12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	14	182	2	0	148	18	0	0	0	35	0	17
Future Volume (Veh/h)	14	182	2	0	148	18	0	0	0	35	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	15	198	2	0	161	20	0	0	0	38	0	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	181			200			418	410	199	400	401	171
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	181			200			418	410	199	400	401	171
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	93	100	98
cM capacity (veh/h)	1394			1372			530	526	842	556	532	873
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	215	181	0	56								
Volume Left	15	0	0	38								
Volume Right	2	20	0	18								
cSH	1394	1372	1700	629								
Volume to Capacity	0.01	0.00	0.00	0.09								
Queue Length 95th (m)	0.3	0.0	0.0	2.3								
Control Delay (s)	0.6	0.0	0.0	11.3								
Lane LOS	A		A	B								
Approach Delay (s)	0.6	0.0	0.0	11.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			33.1%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2041 FT SAT
12/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
Future Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.957			0.984			0.950	
Flt Protected		0.984			0.999			0.997			0.973	
Satd. Flow (prot)	0	1691	0	0	1604	0	0	1698	0	0	1603	0
Flt Permitted		0.984			0.999			0.997			0.973	
Satd. Flow (perm)	0	1691	0	0	1604	0	0	1698	0	0	1603	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	86	180	4	7	190	92	2	27	4	165	25	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	0	0	289	0	0	33	0	0	301	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.4%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2041 FT SAT
12/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	79	166	4	6	175	85	2	25	4	152	23	102
Future Volume (Veh/h)	79	166	4	6	175	85	2	25	4	152	23	102
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	86	180	4	7	190	92	2	27	4	165	25	111
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	283			184			728	651	185	626	607	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	283			184			728	651	185	626	607	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			99	93	100	53	93	86
cM capacity (veh/h)	1273			1397			263	361	855	353	381	801
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	270	289	33	301								
Volume Left	86	7	2	165								
Volume Right	4	92	4	111								
cSH	1273	1397	379	448								
Volume to Capacity	0.07	0.01	0.09	0.67								
Queue Length 95th (m)	1.7	0.1	2.3	38.8								
Control Delay (s)	3.0	0.2	15.4	27.9								
Lane LOS	A	A	C	D								
Approach Delay (s)	3.0	0.2	15.4	27.9								
Approach LOS			C	D								
Intersection Summary												
Average Delay			11.0									
Intersection Capacity Utilization			64.4%		ICU Level of Service					C		
Analysis Period (min)			15									

APPENDIX P

Warrants

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION

FUTURE WEEKDAY PEAK HOUR

Analyst	Aarzo D	Jurisdiction	City of Port Colborne	
Agency or Company	Crozier	Date	15/12/2023	
Analysis Period	2031 Future Total	East-West Street	Highway 3	
Flow Conditions	Free flow (rural)	North-South Street	Snider Road	
'T' Intersection	No	Major Street	East-West	
Existing Intersection	Yes	Approach lanes per direction	1	Major Street
		Approach lanes per direction	1	Minor Street
Additional Comments				

Justification 1: Minimum Vehicle Volumes

JUSTIFIED

No

Justification	Guidance Approach Lanes				Compliance			120% Satisfied
	1 Lanes		2 or More Lanes		Sectional		Entire %	
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, all approaches	480				578	120%	120%	Yes
B. Vehicle volume, along minor streets	120				125	104%	104%	No

Justification 2: Delay To Cross Traffic

JUSTIFIED

No

Justification	Guidance Approach Lanes				Compliance			120% Satisfied
	1 Lanes		2 or More Lanes ¹		Sectional		Entire %	
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, major street	480				453	94%	94%	No
B. Combined vehicle and pedestrian volume crossing artery from minor streets	50				117	234%	234%	Yes

CONCLUSION

The results of the calculations show that justifications are **not met**.

Therefore traffic control signal is **not justified at this intersection for the horizon year 2031 Future Total**

Note: 1. The minimum volumes were corrected from 120 vehicles and 170 vehicles in OTM, March 2012 to 50 vehicles and 70 vehicles to match Justification 2B.

ALL-WAY STOP CONTROL (AWSC) WARRANTS (OTM BOOK 5)

Horizon Year and Analysis Period

2031 Future Total

PROJECT INFORMATION

Analyst Aarzo D
 Company C.F. Crozier & Associates
 Date 12/20/2023

Jurisdiction City of Port Colborne
 Project Name 806 Killaly Street East
 Project No. 2183-6543

ROADWAY INFORMATION

East-West Street Killaly Street
 North-South Street Elizabeth Street
 Roadway Classification (Minor Street) Local Roads

Major Street East-West
 Number of legs 4

TRAFFIC VOLUMES

Peak Hour	Major Road Approaches							Minor Road Approaches							Pedestrian Crossing Major Road	Pedestrian Crossing Minor Road
	Eastbound			Westbound			Total	Northbound			Southbound			Total		
	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT			
AM	99	230	6	63	332	3	733	3	25	9	61	18	119	235	0	0
PM	91	166	4	7	153	69	490	5	20	3	104	25	92	249	0	0
AHV	48	99	3	18	121	18	306	2	11	3	41	11	53	121	0	0

Parameter	AM	PM	AHV	Threshold	
Total vehicle volume on all intersection approaches	968	739	428	200	veh
Combined vehicle and pedestrian volumes on minor street	235	249	121	75	veh
Combined vehicle and pedestrian volumes on minor street + minor street delay*				N/A	veh
	40	30	0	N/A	s
Volume Split, Minor Road (vehicles only)	0.24	0.34	0.28	0.30	

Justification 1: Total Vehicle Volume on all Intersection Approaches **Justified? YES**
 Justification 2A: Combined Vehicle and Pedestrian Volumes on minor street **Justified? YES**
 Justification 2B: Combined Vehicle and Pedestrian Volumes + Delay on minor street **Justified? YES**
 Justification 3: Volume Split (vehicles only) **Justified? NO**

Conclusion: The results of the calculations show that All-Way Stop Control at this intersection is not justified for the 2031 Future Total analysis period.

* Minor Approach Delay under minor stop control using the "AHV" volumes. Delay must be >30s not just for the AM/PM peak, but for the busiest 8 hours of the day to trigger the threshold for Justification 2.
 The All-Way Stop Control justification was done per criteria defined within the Ontario Traffic Manual, Book 5 (December 2021), "All-Way Stop Minimum Volume Warrants"

APPENDIX Q

2041 Future Total Optimized Detailed Capacity Analysis

Lanes, Volumes, Timings

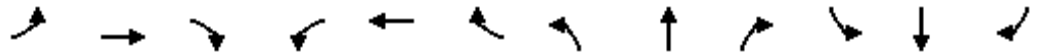
2041 FT Optimized AM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/22/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	244	138	74	462	248	188	274	38	109	179	196
Future Volume (vph)	171	244	138	74	462	248	188	274	38	109	179	196
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	2		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00					0.98						
Flt			0.850			0.850		0.982				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1403	1630	1471	1390	1646	1631	0	3014	1716	1240
Flt Permitted	0.372			0.582			0.635			0.950		
Satd. Flow (perm)	585	1535	1403	999	1471	1366	1100	1631	0	3014	1716	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			144		6				213
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
Confl. Peds. (#/hr)	4					4						
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 (%)	11%	14%	6%	2%	19%	7%	1%	6%	1%	7%	2%	20%
Adj. Flow (vph)	186	265	150	80	502	270	204	298	41	118	195	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	265	150	80	502	270	204	339	0	118	195	213
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

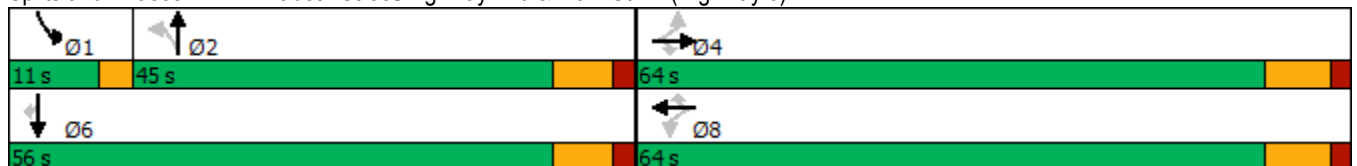


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Prot	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2					6
Detector Phase	4	4	4	8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.9	32.9	32.9	32.9	32.9	32.9	32.4	32.4		9.5	32.4	32.4
Total Split (s)	64.0	64.0	64.0	64.0	64.0	64.0	45.0	45.0		11.0	56.0	56.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	37.5%	37.5%		9.2%	46.7%	46.7%
Maximum Green (s)	56.1	56.1	56.1	56.1	56.1	56.1	37.6	37.6		8.0	48.6	48.6
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.4	5.4		3.0	5.4	5.4
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		0.0	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	0.0
Total Lost Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		3.0	7.4	7.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	Min	Min		None	Min	Min
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0			10.0	10.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0			15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0			0	0
Act Effct Green (s)	56.3	56.3	56.3	56.3	56.3	56.3	27.1	27.1		7.8	37.9	37.9
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.25	0.25		0.07	0.35	0.35
v/c Ratio	0.62	0.34	0.19	0.16	0.66	0.35	0.75	0.83		0.55	0.33	0.38
Control Delay	32.5	18.6	3.4	17.1	26.6	9.4	55.5	55.9		61.4	27.5	5.1
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	32.5	18.6	3.4	17.1	26.6	9.4	55.5	55.9		61.4	27.5	5.1
LOS	C	B	A	B	C	A	E	E		E	C	A
Approach Delay		19.1			20.3			55.7			26.1	
Approach LOS		B			C			E			C	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	109.6
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	28.8
Intersection LOS:	C
Intersection Capacity Utilization:	85.9%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	265	150	80	502	270	204	339	118	195	213
v/c Ratio	0.62	0.34	0.19	0.16	0.66	0.35	0.75	0.83	0.55	0.33	0.38
Control Delay	32.5	18.6	3.4	17.1	26.6	9.4	55.5	55.9	61.4	27.5	5.1
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	32.5	18.6	3.4	17.1	26.6	9.4	55.5	55.9	61.4	27.5	5.1
Queue Length 50th (m)	28.9	33.9	0.0	9.2	80.6	14.7	42.6	71.3	13.4	32.0	0.0
Queue Length 95th (m)	#70.4	62.9	11.5	21.8	143.5	38.5	70.1	105.6	25.2	50.5	15.3
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	300	788	793	513	756	771	379	565	220	763	670
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	0.62	0.34	0.19	0.16	0.66	0.35	0.54	0.60	0.54	0.26	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FT Optimized AM
12/22/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	
Traffic Volume (vph)	1	318	74	5	468	0	289	0	5	0	0	2
Future Volume (vph)	1	318	74	5	468	0	289	0	5	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		60.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.998				0.865
Flt Protected								0.953				
Satd. Flow (prot)	0	1447	1458	0	1391	0	0	1632	0	0	1484	0
Flt Permitted		0.999			0.997			0.729				
Satd. Flow (perm)	0	1445	1458	0	1387	0	0	1248	0	0	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80					27				322
Link Speed (k/h)		70			80			40				50
Link Distance (m)		841.1			852.0			103.0				194.5
Travel Time (s)		43.3			38.3			9.3				14.0
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%	21%	2%	2%	26%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	346	80	5	509	0	314	0	5	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	347	80	0	514	0	0	319	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA				NA
Protected Phases		4			8			2				6

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FT Optimized AM
12/22/2023

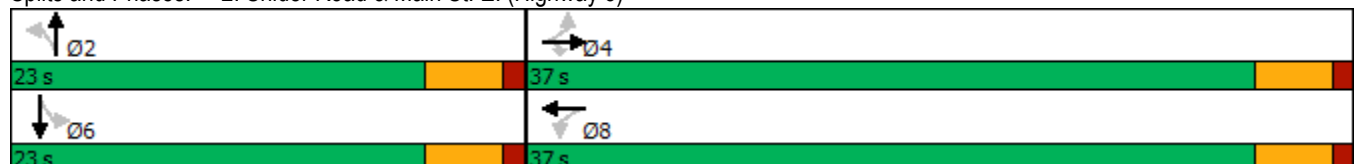


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	37.0	37.0	37.0	37.0	37.0		23.0	23.0		23.0	23.0	
Total Split (%)	61.7%	61.7%	61.7%	61.7%	61.7%		38.3%	38.3%		38.3%	38.3%	
Maximum Green (s)	32.5	32.5	32.5	32.5	32.5		18.5	18.5		18.5	18.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		4.5	4.5		4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		22.7	22.7		22.7			18.8			18.8	
Actuated g/C Ratio		0.45	0.45		0.45			0.37			0.37	
v/c Ratio		0.54	0.11		0.83			0.66			0.00	
Control Delay		13.0	2.5		24.4			24.2			0.0	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		13.0	2.5		24.4			24.2			0.0	
LOS		B	A		C			C			A	
Approach Delay		11.0			24.4			24.2				
Approach LOS		B			C			C				

Intersection Summary

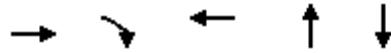
Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 50.7
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 19.8
 Intersection Capacity Utilization 63.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 2: Snider Road & Main St. E. (Highway 3)



Queues
2: Snider Road & Main St. E. (Highway 3)

2041 FT Optimized AM
12/22/2023



Lane Group	EBT	EBR	WBT	NBT	SBT
Lane Group Flow (vph)	347	80	514	319	2
v/c Ratio	0.54	0.11	0.83	0.66	0.00
Control Delay	13.0	2.5	24.4	24.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	2.5	24.4	24.2	0.0
Queue Length 50th (m)	21.8	0.0	39.0	22.3	0.0
Queue Length 95th (m)	39.6	4.9	72.2	#70.6	0.0
Internal Link Dist (m)	817.1		828.0	79.0	170.5
Turn Bay Length (m)		60.0			
Base Capacity (vph)	943	979	905	480	753
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	0.37	0.08	0.57	0.66	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2041 FT Optimized AM
12/22/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
Future Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.979			0.966			0.919	
Flt Protected		0.985						0.996			0.985	
Satd. Flow (prot)	0	1601	0	0	1514	0	0	1663	0	0	1562	0
Flt Permitted		0.985						0.996			0.985	
Satd. Flow (perm)	0	1601	0	0	1514	0	0	1663	0	0	1562	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		1	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 (%)	4%	9%	0%	1%	15%	4%	1%	1%	2%	2%	2%	1%
Adj. Flow (vph)	108	250	7	3	361	68	3	27	10	66	20	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	365	0	0	432	0	0	40	0	0	215	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.1%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2041 FT Optimized AM
12/22/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
Future Volume (vph)	99	230	6	3	332	63	3	25	9	61	18	119
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
Hourly flow rate (vph)	108	250	7	3	361	68	3	27	10	66	20	129
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	365	432	40	215								
Volume Left (vph)	108	3	3	66								
Volume Right (vph)	7	68	10	129								
Hadj (s)	0.17	0.13	-0.11	-0.27								
Departure Headway (s)	5.5	5.4	6.5	5.8								
Degree Utilization, x	0.56	0.65	0.07	0.35								
Capacity (veh/h)	621	644	428	553								
Control Delay (s)	15.4	17.8	10.0	11.9								
Approach Delay (s)	15.4	17.8	10.0	11.9								
Approach LOS	C	C	A	B								
Intersection Summary												
Delay			15.4									
Level of Service			C									
Intersection Capacity Utilization			72.1%		ICU Level of Service		C					
Analysis Period (min)			15									

Lanes, Volumes, Timings

2041 FT Optimized PM

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/22/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	297	398	111	33	402	220	90	303	37	422	508	376
Future Volume (vph)	297	398	111	33	402	220	90	303	37	422	508	376
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	2		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850		0.984				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1675	0	3131	1716	1352
Flt Permitted	0.176			0.511			0.218			0.950		
Satd. Flow (perm)	277	1535	1365	877	1683	1473	374	1675	0	3131	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121			122		5				140
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	323	433	121	36	437	239	98	329	40	459	552	409
Shared Lane Traffic (%)												
Lane Group Flow (vph)	323	433	121	36	437	239	98	369	0	459	552	409
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	

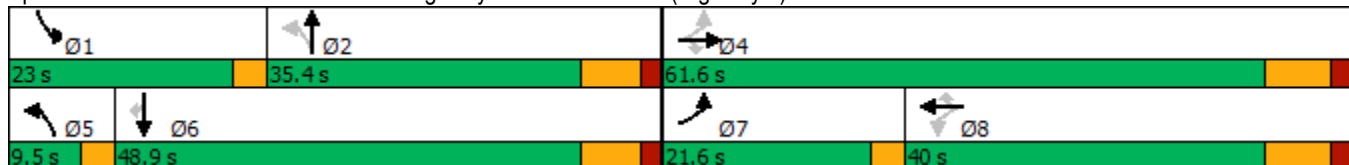


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2					6
Detector Phase	7	4	4	8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	15.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.1	32.9	32.9	32.9	32.9	32.9	9.5	32.4		9.5	32.4	32.4
Total Split (s)	21.6	61.6	61.6	40.0	40.0	40.0	9.5	35.4		23.0	48.9	48.9
Total Split (%)	18.0%	51.3%	51.3%	33.3%	33.3%	33.3%	7.9%	29.5%		19.2%	40.8%	40.8%
Maximum Green (s)	18.6	53.7	53.7	32.1	32.1	32.1	6.5	28.0		20.0	41.5	41.5
Yellow Time (s)	3.0	5.9	5.9	5.9	5.9	5.9	3.0	5.4		3.0	5.4	5.4
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0		0.0	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	0.0
Total Lost Time (s)	3.0	7.9	7.9	7.9	7.9	7.9	3.0	7.4		3.0	7.4	7.4
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max	Max	Max	Max	Max	None	Min		None	Min	Min
Walk Time (s)		10.0	10.0	10.0	10.0	10.0		10.0			10.0	10.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	15.0		15.0			15.0	15.0
Pedestrian Calls (#/hr)		0	0	0	0	0		0			0	0
Act Effct Green (s)	58.6	53.7	53.7	32.1	32.1	32.1	38.3	27.4		19.5	40.4	40.4
Actuated g/C Ratio	0.49	0.45	0.45	0.27	0.27	0.27	0.32	0.23		0.16	0.34	0.34
v/c Ratio	0.99	0.62	0.18	0.15	0.96	0.49	0.52	0.95		0.89	0.95	0.74
Control Delay	73.2	30.1	4.1	35.8	77.4	21.5	31.1	79.6		69.9	65.3	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	73.2	30.1	4.1	35.8	77.4	21.5	31.1	79.6		69.9	65.3	31.5
LOS	E	C	A	D	E	C	C	E		E	E	C
Approach Delay		42.4			56.5			69.4			57.1	
Approach LOS		D			E			E			E	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	118.9
Natural Cycle:	110
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.99
Intersection Signal Delay:	54.9
Intersection LOS:	D
Intersection Capacity Utilization:	94.7%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	323	433	121	36	437	239	98	369	459	552	409
v/c Ratio	0.99	0.62	0.18	0.15	0.96	0.49	0.52	0.95	0.89	0.95	0.74
Control Delay	73.2	30.1	4.1	35.8	77.4	21.5	31.1	79.6	69.9	65.3	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.2	30.1	4.1	35.8	77.4	21.5	31.1	79.6	69.9	65.3	31.5
Queue Length 50th (m)	56.0	80.9	0.0	6.8	107.5	23.5	13.6	89.1	57.9	131.2	59.4
Queue Length 95th (m)	#118.1	117.5	10.9	16.2	#174.3	49.5	24.4	#149.7	#86.7	#201.8	101.2
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	327	693	682	236	454	486	189	398	526	599	563
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	0.99	0.62	0.18	0.15	0.96	0.49	0.52	0.93	0.87	0.92	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FT Optimized PM
12/22/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	
Traffic Volume (vph)	1	517	337	41	444	0	177	1	25	0	0	1
Future Volume (vph)	1	517	337	41	444	0	177	1	25	0	0	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		60.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00										
Frt			0.850					0.983			0.865	
Flt Protected					0.996			0.958				
Satd. Flow (prot)	0	1535	1458	0	1664	0	0	1616	0	0	1484	0
Flt Permitted		0.999			0.924			0.753				
Satd. Flow (perm)	0	1534	1458	0	1544	0	0	1270	0	0	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			366					10			331	
Link Speed (k/h)		70			80			40			50	
Link Distance (m)		841.1			852.0			103.0			194.5	
Travel Time (s)		43.3			38.3			9.3			14.0	
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	562	366	45	483	0	192	1	27	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	563	366	0	528	0	0	220	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FT Optimized PM
12/22/2023

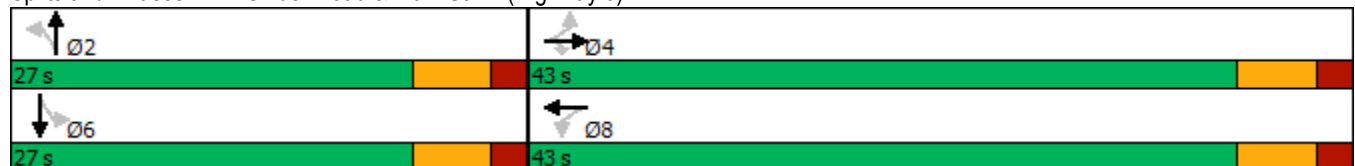


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1		24.1	24.1		24.1	24.1	
Total Split (s)	43.0	43.0	43.0	43.0	43.0		27.0	27.0		27.0	27.0	
Total Split (%)	61.4%	61.4%	61.4%	61.4%	61.4%		38.6%	38.6%		38.6%	38.6%	
Maximum Green (s)	36.9	36.9	36.9	36.9	36.9		20.9	20.9		20.9	20.9	
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1		4.1	4.1	
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	
Total Lost Time (s)		6.1	6.1		6.1			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max	Max	Max	Max		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		37.1	37.1		37.1			15.2			15.2	
Actuated g/C Ratio		0.57	0.57		0.57			0.24			0.24	
v/c Ratio		0.64	0.37		0.60			0.72			0.00	
Control Delay		14.6	2.3		13.6			35.2			0.0	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		14.6	2.3		13.6			35.2			0.0	
LOS		B	A		B			D			A	
Approach Delay		9.8			13.6			35.2				
Approach LOS		A			B			D				

Intersection Summary

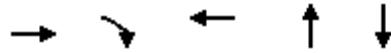
Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 64.6
 Natural Cycle: 60
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 14.3 Intersection LOS: B
 Intersection Capacity Utilization 91.5% ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 2: Snider Road & Main St. E. (Highway 3)



Queues
2: Snider Road & Main St. E. (Highway 3)

2041 FT Optimized PM
12/22/2023



Lane Group	EBT	EBR	WBT	NBT	SBT
Lane Group Flow (vph)	563	366	528	220	1
v/c Ratio	0.64	0.37	0.60	0.72	0.00
Control Delay	14.6	2.3	13.6	35.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	2.3	13.6	35.2	0.0
Queue Length 50th (m)	43.5	0.0	39.3	24.2	0.0
Queue Length 95th (m)	90.7	11.4	81.1	45.9	0.0
Internal Link Dist (m)	817.1		828.0	79.0	170.5
Turn Bay Length (m)		60.0			
Base Capacity (vph)	881	993	886	419	706
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	0.64	0.37	0.60	0.53	0.00

Intersection Summary

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2041 FT Optimized PM
12/22/2023


















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92
Future Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.959			0.986			0.944	
Flt Protected		0.983			0.998			0.992			0.977	
Satd. Flow (prot)	0	1688	0	0	1605	0	0	1693	0	0	1597	0
Flt Permitted		0.983			0.998			0.992			0.977	
Satd. Flow (perm)	0	1688	0	0	1605	0	0	1693	0	0	1597	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1					1			3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	99	180	4	8	166	75	5	22	3	113	27	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	283	0	0	249	0	0	30	0	0	240	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	59.4%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2041 FT Optimized PM
12/22/2023

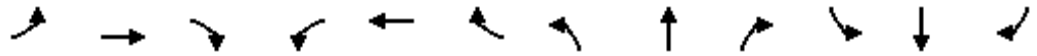
															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Sign Control		Stop			Stop			Stop			Stop				
Traffic Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92			
Future Volume (vph)	91	166	4	7	153	69	5	20	3	104	25	92			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	99	180	4	8	166	75	5	22	3	113	27	100			
Direction, Lane #	EB 1	WB 1	NB 1	SB 1											
Volume Total (vph)	283	249	30	240											
Volume Left (vph)	99	8	5	113											
Volume Right (vph)	4	75	3	100											
Hadj (s)	0.09	-0.10	-0.01	-0.14											
Departure Headway (s)	5.1	4.9	5.7	5.2											
Degree Utilization, x	0.40	0.34	0.05	0.34											
Capacity (veh/h)	669	684	539	642											
Control Delay (s)	11.4	10.5	9.0	10.8											
Approach Delay (s)	11.4	10.5	9.0	10.8											
Approach LOS	B	B	A	B											
Intersection Summary															
Delay			10.9												
Level of Service			B												
Intersection Capacity Utilization			59.4%				ICU Level of Service				B				
Analysis Period (min)			15												

Lanes, Volumes, Timings

2041 FT Optimized SAT

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)

12/22/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	363	204	63	429	209	225	295	42	266	394	179
Future Volume (vph)	225	363	204	63	429	209	225	295	42	266	394	179
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	115.0		110.0	100.0		30.0	100.0		0.0	115.0		25.0
Storage Lanes	1		1	1		1	1		0	2		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850		0.981				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	1535	1365	1630	1683	1473	1630	1671	0	3131	1716	1352
Flt Permitted	0.244			0.529			0.277			0.950		
Satd. Flow (perm)	385	1535	1365	908	1683	1473	475	1671	0	3131	1716	1352
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			222			122		6				99
Link Speed (k/h)		70			70			50				60
Link Distance (m)		407.5			841.1			1044.5				158.6
Travel Time (s)		21.0			43.3			75.2				9.5
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 (%)	11%	14%	9%	2%	4%	1%	2%	3%	1%	3%	2%	10%
Adj. Flow (vph)	245	395	222	68	466	227	245	321	46	289	428	195
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	395	222	68	466	227	245	367	0	289	428	195
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	

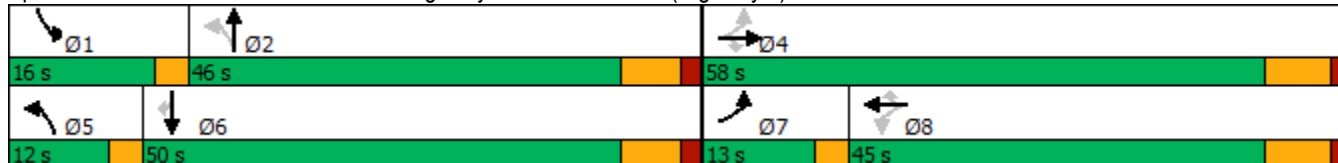


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	2					6
Detector Phase	7	4	4	8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	15.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	9.5	32.9	32.9	32.9	32.9	32.9	9.5	32.4		9.5	32.4	32.4
Total Split (s)	13.0	58.0	58.0	45.0	45.0	45.0	12.0	46.0		16.0	50.0	50.0
Total Split (%)	10.8%	48.3%	48.3%	37.5%	37.5%	37.5%	10.0%	38.3%		13.3%	41.7%	41.7%
Maximum Green (s)	10.0	50.1	50.1	37.1	37.1	37.1	9.0	38.6		13.0	42.6	42.6
Yellow Time (s)	3.0	5.9	5.9	5.9	5.9	5.9	3.0	5.4		3.0	5.4	5.4
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0		0.0	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	0.0
Total Lost Time (s)	3.0	7.9	7.9	7.9	7.9	7.9	3.0	7.4		3.0	7.4	7.4
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max	Max	Max	Max	Max	None	Min		None	Min	Min
Walk Time (s)		10.0	10.0	10.0	10.0	10.0		10.0			10.0	10.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	15.0		15.0			15.0	15.0
Pedestrian Calls (#/hr)		0	0	0	0	0		0			0	0
Act Effct Green (s)	55.3	50.3	50.3	37.3	37.3	37.3	42.0	28.5		12.7	32.2	32.2
Actuated g/C Ratio	0.50	0.46	0.46	0.34	0.34	0.34	0.38	0.26		0.12	0.29	0.29
v/c Ratio	0.83	0.56	0.30	0.22	0.82	0.39	0.89	0.84		0.80	0.85	0.42
Control Delay	45.3	27.2	3.9	31.0	47.8	16.0	56.7	55.1		65.5	53.1	17.4
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	45.3	27.2	3.9	31.0	47.8	16.0	56.7	55.1		65.5	53.1	17.4
LOS	D	C	A	C	D	B	E	E		E	D	B
Approach Delay		26.4			36.8			55.8			49.4	
Approach LOS		C			D			E			D	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 110
 Natural Cycle: 85
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 41.3
 Intersection LOS: D
 Intersection Capacity Utilization 93.5%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Queues

1: Elizabeth Street/Highway 140 & Main St. E. (Highway 3)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	245	395	222	68	466	227	245	367	289	428	195
v/c Ratio	0.83	0.56	0.30	0.22	0.82	0.39	0.89	0.84	0.80	0.85	0.42
Control Delay	45.3	27.2	3.9	31.0	47.8	16.0	56.7	55.1	65.5	53.1	17.4
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	45.3	27.2	3.9	31.0	47.8	16.0	56.7	55.1	65.5	53.1	17.4
Queue Length 50th (m)	32.0	63.9	0.0	11.0	96.0	16.8	35.3	77.4	33.2	90.5	16.4
Queue Length 95th (m)	#83.8	110.7	15.0	25.5	#172.2	43.0	#70.5	113.4	#60.7	129.6	36.7
Internal Link Dist (m)		383.5			817.1			1020.5		134.6	
Turn Bay Length (m)	115.0		110.0	100.0		30.0	100.0		115.0		25.0
Base Capacity (vph)	295	702	745	307	570	579	276	593	371	667	586
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	0.83	0.56	0.30	0.22	0.82	0.39	0.89	0.62	0.78	0.64	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FT Optimized SAT
12/22/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	
Traffic Volume (vph)	0	427	305	23	408	0	252	0	24	0	0	0
Future Volume (vph)	0	427	305	23	408	0	252	0	24	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		60.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.988				
Flt Protected					0.997			0.956				
Satd. Flow (prot)	0	1535	1458	0	1664	0	0	1621	0	0	1716	0
Flt Permitted					0.964			0.744				
Satd. Flow (perm)	0	1535	1458	0	1609	0	0	1261	0	0	1716	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			332					30				
Link Speed (k/h)		70			80			40				50
Link Distance (m)		841.1			852.0			103.0				194.5
Travel Time (s)		43.3			38.3			9.3				14.0
Confl. Peds. (#/hr)	1						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 (%)	2%	14%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	464	332	25	443	0	274	0	26	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	464	332	0	468	0	0	300	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: Snider Road & Main St. E. (Highway 3)

2041 FT Optimized SAT
12/22/2023

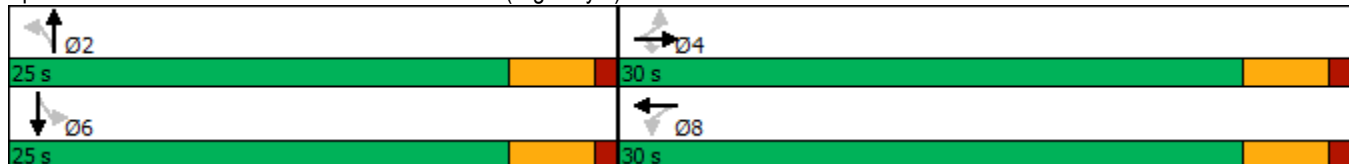


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA	Perm	Perm	NA		Perm	NA				
Protected Phases		4			8			2				6
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	30.0	30.0	30.0	30.0	30.0		25.0	25.0		25.0	25.0	
Total Split (%)	54.5%	54.5%	54.5%	54.5%	54.5%		45.5%	45.5%		45.5%	45.5%	
Maximum Green (s)	25.5	25.5	25.5	25.5	25.5		20.5	20.5		20.5	20.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		4.5	4.5		4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		19.1	19.1		19.1			20.8				
Actuated g/C Ratio		0.39	0.39		0.39			0.42				
v/c Ratio		0.77	0.43		0.75			0.54				
Control Delay		22.5	3.3		20.7			15.7				
Queue Delay		0.0	0.0		0.0			0.0				
Total Delay		22.5	3.3		20.7			15.7				
LOS		C	A		C			B				
Approach Delay		14.5			20.7			15.7				
Approach LOS		B			C			B				

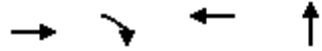
Intersection Summary

Area Type: Other
 Cycle Length: 55
 Actuated Cycle Length: 49
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 16.6
 Intersection LOS: B
 Intersection Capacity Utilization 68.0%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Snider Road & Main St. E. (Highway 3)



Queues
2: Snider Road & Main St. E. (Highway 3)



Lane Group	EBT	EBR	WBT	NBT
Lane Group Flow (vph)	464	332	468	300
v/c Ratio	0.77	0.43	0.75	0.54
Control Delay	22.5	3.3	20.7	15.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.5	3.3	20.7	15.7
Queue Length 50th (m)	34.7	0.0	34.5	17.8
Queue Length 95th (m)	63.2	11.1	61.6	45.1
Internal Link Dist (m)	817.1		828.0	79.0
Turn Bay Length (m)		60.0		
Base Capacity (vph)	808	925	847	551
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.36	0.55	0.54
Intersection Summary				

Lanes, Volumes, Timings
6: Elizabeth Street & Killaly St. E

2041 FT Optimized SAT
12/22/2023



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
Future Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.957			0.984			0.950	
Flt Protected		0.984			0.999			0.997			0.973	
Satd. Flow (prot)	0	1691	0	0	1604	0	0	1698	0	0	1603	0
Flt Permitted		0.984			0.999			0.997			0.973	
Satd. Flow (perm)	0	1691	0	0	1604	0	0	1698	0	0	1603	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		201.0			835.9			155.4			1044.5	
Travel Time (s)		14.5			60.2			11.2			94.0	
Confl. Peds. (#/hr)	1						1		3	3		
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%	1%	0%	1%	6%	1%	1%	1%	2%	0%	2%	2%
Adj. Flow (vph)	86	180	4	7	190	92	2	27	4	165	25	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	0	0	289	0	0	33	0	0	301	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.4%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Elizabeth Street & Killaly St. E

2041 FT Optimized SAT
12/22/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
Future Volume (vph)	79	166	4	6	175	85	2	25	4	152	23	102
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
Hourly flow rate (vph)	86	180	4	7	190	92	2	27	4	165	25	111
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	270	289	33	301								
Volume Left (vph)	86	7	2	165								
Volume Right (vph)	4	92	4	111								
Hadj (s)	0.08	-0.11	-0.04	-0.10								
Departure Headway (s)	5.4	5.2	5.9	5.3								
Degree Utilization, x	0.40	0.41	0.05	0.45								
Capacity (veh/h)	628	655	507	627								
Control Delay (s)	12.0	11.8	9.3	12.6								
Approach Delay (s)	12.0	11.8	9.3	12.6								
Approach LOS	B	B	A	B								
Intersection Summary												
Delay			12.0									
Level of Service			B									
Intersection Capacity Utilization			64.4%	ICU Level of Service	C							
Analysis Period (min)			15									