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Mapleview & Essa Development

TRAFFIC IMPACT STUDY

Pearl Builders

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1 Introduction

Tatham Engineering Limited was retained by Pearl Builders to address the traffic impacts associated with the proposed multi-use development to be located at the northeast corner of the intersection of Mapleview Drive West and Essa Road within the City of Barrie. The location of the development site is illustrated in Figure 1.

1.1 STUDY PURPOSE

The purpose of this study is to address the requirements of the City of Barrie with respect to the potential transportation impacts of the proposed development on the local road network. In particular, the following will be discussed:

- the existing operations of the road system through the study area;
- the growth in the traffic volumes not otherwise attributed to the development (i.e. from overall growth in the area and/or other developments);
- the number of new vehicle trips the proposed development is likely to generate;
- the operations of the study area road system upon completion of the development; and
- the resulting impacts and need for mitigating measures (if required) to ensure acceptable overall road operations.

1.2 REPORT STRUCTURE

The report is structured as follows:

- Chapter 1: introduction and study purpose;
- Chapter 2: existing conditions, detailing the road system and corresponding traffic operations;
- Chapter 3: future conditions, prior to the completion of the proposed development (referred to as future background conditions), and the expected growth in traffic levels and the resulting operating conditions;
- Chapter 4: proposed development and associated details including land use, access, traffic volumes and parking;
- Chapter 5: future conditions, with completion of the proposed development (referred to as future total conditions);
- Chapter 6: transportation demand management, detailing alternative transportation options and a transportation demand management plan; and
- Chapter 7: summary of the report and key findings.

2 Existing Conditions

This chapter will describe the road network, transit network, traffic volumes, and operations for the existing conditions.

2.1 ROAD NETWORK

The road network to be addressed by this study consists of the following road sections and their respective intersections:

Roads

- Essa Road
- Harvie Road
- Hollyholme Farm Road
- Mapleton Avenue
- Mapleview Drive
- Veterans Drive

Intersections

- Essa Road and Veterans Drive
- Essa Road and Harvie Road
- Essa Road and Mapleton Ave
- Essa Road and Mapleview Drive
- Mapleview Drive and Hollyholme Farm Road
- Mapleview Drive and Veterans Drive

Aerial mapping and photographs of the road system are provided in Figure 2.

2.1.1 Roads

Brief descriptions of the study area roads are provided in Table 1 with additional information as follows:

- Functional Classification: The functional classification of each road has been based on *Schedule D – Roads Plan* of the *City of Barrie Official Plan*[1], whereas the planning capacity is based on information contained within the *City of Barrie Transportation Master Plan*[2] (TMP). It is noted that the functional classifications identified in the current *Official Plan* are consistent with those proposed in the draft *City of Barrie Official Plan 2051*[3] *(Map 4B: Mobility Network)* for the study area road network (the draft *Official Plan* has been approved by City Council and has been sent to the Ministry of Municipal Affairs and Housing for approval).

[1] *City of Barrie Official Plan*. City of Barrie. April 2010 (Office consolidated January 2018).
[2] *City of Barrie Transportation Master Plan*. WSP. June 2019.
[3] *The City of Barrie Official Plan 2051.* City of Barrie. January 2022.

- Number of Lanes: Roads with an odd number of lanes (e.g. 3, 5 or 7) contain a centre two-way left turn lane (TWLTL), whereas roads with an even number of lanes (e.g. 2, 4 or 6) do not.
- Orientation: While Essa Road is oriented northeast to southwest it is referenced as north-south for ease of reference, Mapleview Drive is oriented east-west.

Table 1: Study Area Roads

ROAD	CLASSIFICATION	LANES	SPEED LIMIT (km/h)	CAPACITY[1] (vphpl)	DIRECTION
Essa Road[1]	Arterial	2 to 5	50 to 60	750 to 850	N-S
Harvie Road	Arterial	3	50	850	E-W
Hollyholme Farm Road	Local	2	50	400	N-S
Mapleton Ave	Major Collector	2	50	650	E-W
Mapleview Drive	Arterial	7	60	850	E-W
Veterans Drive	Arterial	5	60	850	N-S

[1] Essa Road transitions from a 5-lane cross section (850 vphpl, 50 km/h) north of Coughlin Road to a 2-lane cross-section (750 vphpl, 60 km/h) south of Coughlin Road

2.1.2 Intersections

The configurations for each of the study area intersections are detailed in Table 2. Each intersection is controlled by traffic signals, with Essa Road or Mapleview Drive serving as the major roads (at the intersection of Essa Road with Mapleview Drive, the former is considered the major road).

Table 2: Study Area Intersections

INTERSECTION & CONTROL		APPROACH LANE CONFIGURATION			
		North	South	East	West
Essa Road & Ferndale Drive/ Veterans Drive	traffic signal	1 left turn lane 1 thru lane 1 shared thru/ right lane	1 left turn lane 1 thru lane 1 shared thru/ right lane	1 left turn lane 1 thru lane 1 shared thru/ right lane	1 left turn lane 1 thru lane 1 shared thru/ right lane
Essa Road & Harvie Road	traffic signal	1 left turn lane 1 thru lane 1 shared thru/ right lane	1 left turn lane 1 thru lane 1 shared thru/ right lane	1 left turn lane 1 shared thru/ right lane	1 left turn lane 1 shared thru/ right lane

INTERSECTION & CONTROL		APPROACH LANE CONFIGURATION			
		North	South	East	West
Essa Road & Mapleton Avenue	traffic signal	1 left turn lane 1 thru lane 1 shared thru/ right lane	1 left turn lane 1 thru lane 1 shared thru/ right lane	1 left turn lane 1 shared thru/ right lane	1 left turn lane 1 shared thru/ right lane
Essa Road & Mapleview Drive	traffic signal	1 left turn lane 1 thru lane 1 right turn lane	1 left turn lane 1 thru lane 1 right turn lane	1 left turn lane 2 thru lanes 1 right turn lane	1 left turn lane 1 thru lane 1 shared thru/ right lane
Mapleview Drive & Hollyholme Farm Road	traffic signal	2 left turn lanes 1 right turn lane	1 left turn lane 1 shared thru/ right turn lane	1 left turn lane 2 thru lanes 1 shared thru/ right turn lane	1 left turn lane 2 thru lanes 1 shared thru/ right turn lane
Mapleview Drive & Veterans Drive	traffic signal	1 left turn lane 1 thru lane 1 shared thru/ right lane	1 left turn lane 1 thru lane 1 shared thru/ right lane	1 left turn lane 2 thru lanes 1 shared thru/ right turn lane	1 left turn lane 2 thru lanes 1 shared thru/ right turn lane

2.2 TRANSIT NETWORK

Barrie Transit currently operates 3 bus routes within the study area, which pass by the site along Essa Road and Mapleview Drive:

- Route 7A and 7B;
- Route 8A-northbound (8A-NB); and
- Route 8B-southbound (8B-SB).

A system map of all current Barrie Transit routes and further information with respect to routings and bus stop locations through the study are provided in Figure 3 with relevant operational details as follows:

- each route operates from approximately 5:00AM to 12:00AM (midnight) on weekdays, 7:00AM to 12:00AM on Saturdays, and 9:00AM to 10:00PM on Sundays;
- each route operates at a 30 minute headway during weekdays and Saturdays and at a 60 minute headway during evenings and Sundays;
- each route services the downtown transit terminal, Park Place and the Allandale Waterfront GO Station; and

- within the study area, bus stops are located at/near the intersection of Mapleview Drive with Essa Road and along Mapleview Drive at Hollyholme Farm Road.

Current ridership data (from May to October 2022) was obtained from Barrie Transit for each noted route and is summarized in Table 3. Based on a capacity of 55 persons per bus, each transit route still has substantial residual capacity currently remaining during peak times.

Table 3: Barrie Transit Ridership

ROUTE	STOP NUMBER	AM PEAK PERIOD (7:00-10:00AM)		PM PEAK PERIOD (3:00-6:00PM)	
		Average Load (passengers)	Utilized Capacity (%)	Average Load (passengers)	Utilized Capacity (%)
7A	853	5.3	10%	17.7	32%
7B	870	8.3	15%	12.3	22%
8A-NB	308	6.3	12%	20.7	38%
8B-SB	870	14.7	27%	19.7	36%

2.3 ACTIVE TRANSPORTATION NETWORK

Active transportation infrastructure (such as sidewalks, cycling lanes and multi-use pathways) is critical to ensure that short-distance trips can be completed safely and efficiently without using a motor vehicle. An assessment of active transportation facilities within an approximately 500 metre radius of the subject site was conducted to determine the availability and quality of said infrastructure. The available active transportation facilities are illustrated in Figure 4.

As indicated, good active transportation facilities are present along Mapleview Drive, with a sidewalk or paved multi-use path present on each side of the road. Active transportation facilities along Essa Road are limited, with none present north of Mapleview Drive and a single sidewalk present south of Mapleview Drive.

2.4 TRAFFIC VOLUMES

To determine existing traffic volumes, traffic counts were conducted on Tuesday, November 15, 2022 at each of the intersections noted in Section 2.1.2. The observed volumes are illustrated in Figure 5, with detailed count sheets provided in Appendix A.

2.5 TRAFFIC OPERATIONS

The assessment of existing conditions provides the baseline from which the future traffic operations (both with and without the subject development) can be assessed from. The operational assessment of existing conditions has considered the following:

- operations at the key intersections; and
- vehicle queue operations.

2.5.1 Intersection Operations

The capacity, and hence operations, of a road system is effectively governed by its intersections. The analysis is based on the 2022 traffic volumes, the existing intersection configuration and control, and procedures outlined in the *2000 Highway Capacity Manual*[4] (using Synchro v.11 software). For each intersection, the analysis considers:

- the average delay (measured in seconds);
- level of service (LOS); and
- volume to capacity (v/c) for each movement if signalized, or for critical movements only if unsignalized.

With respect to the noted metrics:

- level of service 'A' corresponds to the best operating condition with minimal delays whereas level of service 'F' corresponds to poor operations resulting from high intersection delays (additional details regarding Level of Service definitions are provided in Appendix B); and
- a v/c ratio of less than 1.0 indicates the intersection movement is operating at less than capacity while v/c of 1.0 indicates capacity has been reached.

A summary of the analysis is provided in Table 4 with detailed worksheets available in Appendix C. Signal timing plans for the signalized intersections within the study area were obtained from the City of Barrie and implemented into the traffic model to accurately reflect the existing traffic control. Per City of Barrie guidelines, the following conditions are highlighted in the operations summary tables:

- any individual movements operating at LOS F;
- any intersections operating at LOS D (or greater) overall; and
- any movement or intersection operating with v/c $\geq$ 0.85.

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[4] *Highway Capacity Manual.* Transportation Research Board, Washington DC, 2000.

It is noted that the intersections of Essa Road with Coughlin Road and Mapleview Drive with Reid Drive are not included in the assessment in that the noted minor roads are not expected to experience an increase in traffic volumes resulting from the proposed development (additional discussion is provided in Section 4.5.3) and hence their operations are unlikely to be significantly impacted by the proposed development.

As indicated, each intersection currently provides good overall operations (LOS D or better) with most individual movements providing acceptable operations (LOS E or better). Some specific movements are observed to operate at LOS F and at/over capacity (v/c ≥ 1.00) during the PM peak period. However, these can be addressed through modifications to the existing signal timing plans to provide additional green time to those movements.

Table 4: Intersection Operations – 2022

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Essa Road & Mapleview Drive	EB L	signal	19	B	0.33	26	C	0.55
	EB TR	signal	34	C	0.79	29	C	0.49
	WB L	signal	24	C	0.44	21	C	0.54
	WB T	signal	28	C	0.31	38	D	**0.86**
	WB R	free	26	C	0.04	25	C	0.16
	NB L	signal	23	C	0.12	24	C	0.17
	NB T	signal	25	C	0.29	28	C	0.44
	NB R	signal	22	C	0.10	23	C	0.10
	SB L	signal	16	B	0.20	17	B	0.23
	SB T	signal	17	B	0.21	19	B	0.32
	SB R	signal	15	B	0.08	17	B	0.14
	overall	signal	27	C	0.50	28	C	0.63
Mapleview Drive & Hollyholme Farm Road	EB L	signal	3	A	0.00	6	A	0.01
	EB TR	signal	5	A	0.29	7	A	0.23
	WB L	signal	3	A	0.04	6	A	0.01
	WB TR	signal	4	A	0.12	8	A	0.41
	NB L	signal	42	D	0.05	34	C	0.25
	NB TR	signal	43	D	0.01	37	D	0.01
	SB L	signal	43	D	0.01	44	D	0.02
	SB R	signal	44	D	0.00	45	D	0.00
	overall	signal	5	A	0.28	9	A	0.40
Mapleview Drive & Veterans Drive	EB L	signal	19	B	0.19	26	C	0.60
	EB TR	signal	27	C	0.52	26	C	0.53

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
	WB L	signal	29	C	0.72	34	C	0.79
	WB TR	signal	24	C	0.31	33	C	0.82
	NB L	signal	19	B	0.16	25	C	0.58
	NB TR	signal	25	C	0.20	33	C	0.65
	SB L	signal	23	C	0.58	48	D	**0.85**
	SB TR	signal	25	C	0.35	29	C	0.41
	overall	signal	25	C	0.68	31	C	0.83
Essa Road & Mapleton Avenue	EB L	signal	29	C	0.63	32	C	0.73
	EB TR	signal	25	C	0.33	23	C	0.29
	WB L	signal	39	D	0.17	38	D	0.19
	WB TR	signal	42	D	0.50	54	D	0.80
	NB L	signal	11	B	0.05	19	B	0.40
	NB TR	signal	14	B	0.19	19	B	0.28
	SB L	signal	12	B	0.03	17	B	0.05
	SB TR	signal	15	B	0.26	27	C	0.65
	overall	signal	21	C	0.41	29	C	0.69
Essa Road & Harvie Road	EB L	signal	37	D	0.15	32	C	0.09
	EB TR	signal	38	D	0.27	32	C	0.14
	WB L	signal	46	D	0.62	**89**	**F**	**0.99**
	WB TR	signal	37	D	0.15	36	D	0.45
	NB L	signal	6	A	0.01	9	A	0.04
	NB TR	signal	7	A	0.24	13	B	0.35
	SB L	signal	5	A	0.04	8	A	0.10
	SB TR	signal	6	A	0.16	12	B	0.36
	overall	signal	14	B	0.30	26	C	0.53
Essa Road & Veterans Drive/ Ferndale Drive	EB L	signal	30	C	0.35	29	C	0.42
	EB TR	signal	51	D	**0.89**	31	C	0.60
	WB L	signal	32	C	0.19	24	C	0.15
	WB TR	signal	38	D	0.55	**83**	**F**	**1.07**
	NB L	signal	14	B	0.19	24	C	0.58
	NB TR	signal	19	B	0.19	28	C	0.27
	SB L	signal	13	B	0.51	24	C	0.65
	SB TR	signal	17	B	0.18	31	C	0.56
	overall	signal	32	C	0.63	**48**	**D**	0.82

2.5.2 Queue Operations

The presence of traffic queues at the subject intersections was considered where exclusive turn lanes are present to ensure they are appropriately sized. The queueing analysis was conducted using *SimTraffic*, the traffic microsimulation module that accompanies the Synchro traffic modelling software, based on the following:

- existing storage lengths as per the existing lane configurations and measurements (which reflect the storage + parallel lane lengths) with consideration for applicable standards with respect to parallel lane lengths;
- the average results of 5 simulation runs, with each simulation consisting of a 30-minute seed time and 60-minute run time; and
- 50th and 95th percentile queues (the 50th percentile queues reflect the average queue length, thus will be exceeded 50% of the time, whereas the 95th percentile queues will only be exceeded 5% of the time).

The results of the queue operations are summarized in Table 5, with detailed worksheets provided in Appendix C. Queues which exceed the available storage length are highlighted.

Table 5: Queue Operations – 2022

INTERSECTION & MOVEMENTS		STORAGE LENGTH	AM PEAK HOUR QUEUES		PM PEAK HOUR QUEUES	
			50th	95th	50th	95th
Essa Road & Mapleview Drive	EB L	80m	18m	34m	17m	27m
	WB L	50	11	24	23	45
	NB L	60	6	16	7	16
	NB R	30	7	15	7	24
	SB L	50	14	28	13	25
	SB R	30	5	12	19	**47**
Mapleview Drive & Hollyholme Farm Road	EB L	30	-	-	2	6
	WB L	30	2	7	-	-
	NB L	30	1	5	11	19
	SB L	40	1	2	1	3
Mapleview Drive & Veterans Drive	EB L	150	9	18	17	31
	WB L	80	27	45	27	41
	NB L	80	10	20	30	55
	SB L	140	41	72	37	57
Essa Road & Mapleton Avenue	EB L	40	36	**57**	40	**64**
	WB L	20	5	14	8	23
	NB L	40	5	13	14	25

INTERSECTION & MOVEMENTS		STORAGE LENGTH	AM PEAK HOUR QUEUES		PM PEAK HOUR QUEUES	
			50th	95th	50th	95th
	SB L	40	2	9	5	24
Essa Road & Harvie Road	EB L	40	4	12	3	7
	WB L	100	20	36	56	91
	NB L	40	0	1	1	2
	SB L	40	2	5	4	11
Essa Road & Veterans Drive/ Ferndale Drive	EB L	50	17	41	14	26
	WB L	70	7	16	16	60
	NB L	60	13	26	28	48
	SB L	70	33	56	39	69

As indicated, the available storage length at each dedicated turn lane is generally sufficient to accommodate the 50th and 95th percentile queues under existing conditions. Two exceptions are noted where the 95th percentile queue exceeds the available storage length, suggesting that additional storage length may be necessary to accommodate existing volumes:

- Essa Road and Mapleton Avenue – eastbound left (AM and PM peaks); and
- Essa Road and Mapleview Drive – southbound right (PM peak only).

It is noted that lengthening of the eastbound left turn lane is not feasible on Mapleton Avenue due to the close proximity of the Essa Road intersection to the intersection of Mapleton Avenue with Leslie Avenue and a commercial access (approximately 80 metres centre-to-centre). Further lengthening of the turn lane would interfere with the intersection at Leslie Avenue, which is undesirable.

Lengthening of the southbound right turn lane at Essa Road and Mapleview Drive is not considered necessary, recognizing that the lane is shown to perform well in the operations assessment.

2.5.3 Operational Summary

Based on the results of the above analyses, the existing weekday AM and PM peak hours volumes are reasonably accommodated by the current configuration of the study area road network. Minor alterations to existing signal timing plans may be considered to further improve operations at some intersections.

3 Future Background Conditions

This chapter will describe the road network and background traffic volumes expected for the years 2027, 2031, 2036 and 2041. The 2027 horizon has been adopted as an interim horizon reflecting partial build-out of the subject site. The 2031 horizon has been adopted to reflect full build-out of the subject development, whereas the 2036 and 2041 horizons will address longer-term impacts of the development (5 and 10 years beyond build-out).

3.1 ROAD NETWORK

Within the study area, the section of Essa Road between Mapleview Drive and Coughlin Road is planned to be upgraded from its current 2-lane cross-section to a 5-lane urban cross-section. The new cross-section will provide two lanes of travel per direction, a centre two-way left turn lane, a paved multi-use path on the west side of the road, and a sidewalk on the east side of the road, matching the existing cross-section north of Coughlin Road. The City's TMP states these works are to be completed by 2031, however per communications with City staff, this project is currently on hold with completion not expected before 2031. For the purposes of this report, the existing 2-lane configuration of the noted road segment will be maintained until operations dictate the need for improvements, at which point the 5-lane cross-section will be considered for implementation.

No further improvements to the area road network are currently proposed.

3.2 TRANSIT NETWORK

Near-Term

Per communications with City staff, Barrie Transit is in the process of revising its existing transit network to a new network intended to be fully implemented by 2025. It is understood that the new network will consist of:

- 3 "frequent" routes operating at 15-minute headways, providing connections between most major destinations and transit hubs in the City;
- 5 "local" routes operating at 30-minute headways, providing service through many parts of the city not covered by the frequent routes;
- 1 "express" route operating at a 30-minute headway, travelling between Royal Victoria Hospital/Georgian College and Park Place via Highway 400; and
- 7 "transit-on-demand" (ToD) zones, serving nearly every major corridor within the city not already served by the above fixed routes.

ToD transit does not operate on a fixed schedule or fixed route. Instead, riders will be able to book a transit trip (similar to a taxi or rideshare service) within a specific ToD zone and have a dedicated bus dispatched to complete their trip within that zone (or provide a connection to one of the fixed routes). The ToD service states that a bus will arrive within 20 minutes of booking a trip.

A draft map of the network is illustrated in Figure 6. As indicated, two local routes (Route 13 and Route 17) will pass through the study area along Essa Road and Mapleview Drive, providing connections to the downtown bus terminal, Park Place, the Allandale Waterfront GO Station and the Barrie South GO Station. Additionally, these routes will provide direct access to ToD zones D, E, F and G.

Long-Term

The City's TMP identifies a proposed transit network with further improved service levels (compared to those planned in the near-term) to be active by 2041. Two high-frequency (10-minute headway) core routes and one lower-frequency (20-minute headway) support route would pass through the study area along Essa Road and Mapleview Drive, providing connections to the downtown bus terminal, Park Place, and Allandale Waterfront GO.

A conceptual map of the proposed long-term network is also illustrated in Figure 6.

3.3 ACTIVE TRANSPORTATION

In addition to the improvements along Essa Road noted in Section 3.1, the City's TMP identifies further improvements to the active transportation facilities within the study area, including:

- the addition of a multi-use path along Mapleview Drive, east of Essa Road;
- the addition of a multi-use path along Essa Road, south of Mapleview Drive; and
- the addition of a sidewalk along Hollyholme Farm Road.

Per communications with City staff, these upgrades are to be implemented post 2031.

3.4 TRAFFIC VOLUMES

Background traffic volumes expected for the 2027, 2031, 2036 and 2041 horizon years have been determined based on the existing traffic volumes, projected growth and consideration for other development-specific traffic volumes.

3.4.1 Background Growth

Annual growth rates along the study area road network have been derived from the City's EMME traffic model created in support of their 2019 TMP. A summary of the growth rates within the

study area is provided in Table 6. Negative growth indicates an expected reduction in traffic volumes due to factors such as increased shares of non-automobile travel modes and redistribution of trips to other links in the network.

Table 6: EMME-Derived Growth Rates

ROAD	FROM	TO	2016 TO 2031	2031 TO 2041
Essa Road	south study limit	Mapleton Avenue	2.4%	1.0%
	Mapleton Avenue	north study limit	0.9%	-2.0%
Mapleview Drive	west study limit	east study limit	2.1%	-0.5%
Veterans Drive	north study limit	south study limit	2.0%	1.1%

The 2016 to 2031 growth rates listed in Table 6 were applied to each noted road segment through the 2031 horizon whereas the 2031 to 2041 growth rates were applied to each horizon beyond 2031. In instances where a negative growth rate is expected, a 0.5% growth per annum was applied to remain conservative.

For all remaining roads, a 1.0% growth rate was applied through the 2041 horizon recognizing that significant growth is not expected on them.

3.4.2 Background Developments

Several other developments are proposed within the study area which will contribute traffic volumes to the road network. The location of each development in relation to the subject site is illustrated in Figure 7 with additional details of each provided below. All background developments are assumed to be built out by the 2027 horizon.

90 Mapleview Drive

The development proposed for 90 Mapleview Drive consists of a 22,000 m^2 warehouse development. Per the *Traffic Impact Brief – 90 Mapleview Drive*[5] report, the site is expected to generate 54 total trips during the weekday AM peak hour and 56 total trips during the weekday PM peak hour. As identified in the report, the traffic volumes expected to be generated by the site represent an insubstantial proportion of the overall volumes currently present on Mapleview Drive. Therefore, new traffic generated by the site is assumed to be captured in the annual background growth applied to the road network.

[5] *Traffic Impact Brief – 90 Mapleview Drive*. C.F. Crozier & Associates Inc. September 22, 2021.

201 Mapleview Drive

The development proposed for 201 Mapleview Drive consists of an approximately 1,394 m^2 (15,000 ft^2) car dealership. Trip generation for the site is based on the proposed land-use, development size, and trip generation rates per the *ITE Trip Generation Manual*[6] as detailed in Table 7. As indicated, the site is expected to generate 28 total trips during the weekday AM peak hour and 37 new trips during the weekday PM peak hour. Due to the low trip generation of the site, no material impact to the road network is expected. Therefore, new traffic generated by the site is assumed to be captured in the annual background growth applied to the road network.

Table 7: Trip Generation – 201 Mapleview Drive

LAND USE	ITE LAND-USE CODE	VARIABLE/ SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			In	Out	Total	In	Out	Total
automobile sales (new)	840	1000 ft^2 GFA	1.36	0.50	1.86	0.97	1.45	2.42
		15,000 ft^2	20	8	28	15	22	37

323 Mapleview Drive

The development proposed for 323 Mapleview Drive consists of a 5,001 m^2 commercial plaza, a 418 m^2 restaurant, and a 372 m^2 restaurant with drive-through. Per the *323 Mapleview Drive West Transportation Study*[7], the site is expected to generate a total of 340 trips during the weekday AM peak hour, and 451 trips during the weekday PM peak hour. The associated trip distribution and assignment to the study area road network is illustrated in Appendix D and is based on that provided in the noted traffic study.

341 Mapleview Drive

The development proposed for 341 Mapleview Drive consists of a 9,656 m^2 (103,930 ft^2) self-storage facility. Per the *323 Mapleview Drive West Transportation Study*, the site is expected to generate 10 total trips during the weekday AM peak hour and 18 total trips during the weekday PM peak hour. Due to the low trip generation of the site, no material impact to the road network is expected. Therefore, new traffic generated by the site is assumed to be captured in the annual background growth applied to the road network.

[6] *Trip Generation Manual, 11th Edition.* Institute of Transportation Engineers. September 2021.
[7] *323 Mapleview Drive West Transportation Study*. R.J. Burnside & Associates Ltd. October 2021.

407-419 Mapleview Drive

The development proposed for 407-419 Mapleview Drive consists of a townhouse development. Per the *407-419 Mapleview Drive West Traffic Study*[8], the site consists of 88 townhouse units and is expected to generate 40 trips during the weekday AM peak hour and 49 trips during the weekday PM peak hour. It is noted that revisions to the development application have reduced the unit count to 46 units, or approximately half the units originally assessed in the noted traffic study. Trip generation has been reduced proportionally based on the revised unit count, resulting in a total of 21 new trips during the weekday AM peak hour and 26 new trips during the weekday PM peak hour. Due to the low trip generation of the site, no material impact to the road network is expected. Therefore, the volumes generated by the site are assumed to be captured in the background growth on the road network.

440 Essa Road

The development proposed for 440 Essa Road consists of an 8-storey, 194-unit residential apartment building with 1,208 m^2 (13,000 ft^2) of ground floor commercial area. Trip generation for the site is based on the proposed land-uses, development size and trip generation rates per the *ITE Trip Generation Manual* as detailed in Table 8. As indicated, the site is expected to generate 89 new trips during the weekday AM peak hour and 161 new trips during the weekday PM peak hour. The associated trip assignment and distribution is illustrated in Appendix D and is based on the assignment and distribution applied to the subject development, as detailed in Section 4.5.3.

Table 8: Trip Generation – 440 Essa Road

LAND USE	ITE LAND-USE CODE	VARIABLE/ SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			In	Out	Total	In	Out	Total
multifamily housing – mid-rise	221	units	0.09	0.28	0.37	0.24	0.15	0.39
		194	17	55	72	46	30	76
strip retail plaza (<40,000 ft^2)	822	1000 ft^2 GLA	1.42	0.94	2.36	3.30	3.30	6.59
		13,000 ft^2	18	12	30	43	43	86
Total			**35**	**67**	**102**	**89**	**73**	**162**

[8] *407-419 Mapleview Drive West Traffic Study*. Tatham Engineering Ltd. November 3, 2020.

3.4.3 Volume Adjustments

Per communications with City staff, it is understood that the extension of Bryne Drive is to be complete by 2027. This will provide a new north-south arterial connection between Mapleview Drive and Essa Road east of Veterans Drive, which is expected to somewhat reduce the volume of traffic on Veterans Drive. To reflect this redistribution of traffic to the new link, 25% of the southbound left and westbound right turning volumes at the intersection of Veterans Drive with Essa Road and with Mapleview Drive were removed from the background traffic volumes.

3.4.4 Background Traffic Volumes

Future background volumes at each horizon year, as illustrated in Figure 8 through Figure 11, have been determined based on the following:

- the 2022 volumes;
- the noted background growth rates;
- additional volumes generated by the noted background developments; and
- volume adjustments reflective of the completion of the Bryne Drive extension.

It is noted that by the 2027 horizon during the PM peak hour, northbound volumes on Essa Road meet the road capacity (750 vehicles per hour) between Mapleview Drive and Coughlin Road. By the 2031 horizon volumes exceed this capacity in both directions during the PM peak hour. This suggests that the upgrade timeline provided in the City's TMP is valid and the upgrades noted in Section 3.1 are warranted by 2027 and required by 2031 to increase the road capacity. Therefore, the upgrades to Essa Road noted in Section 3.1 are assumed to be in place by the 2031 horizon.

3.5 TRAFFIC OPERATIONS

Intersection operations were reviewed for each horizon year whereas the vehicle queueing operations were limited to the 2031 and 2041 horizons, as these are the most critical horizons.

3.5.1 Intersection Operations

Operations of each intersection are summarized in Table 9 through Table 12 with detailed worksheets provided in Appendix E. It is noted that the assessment is somewhat conservative in that a continuous positive growth in volumes has been assumed on all road sections beyond the 2031 horizon. Per the City's EMME model, some road sections (such as parts of Mapleview Drive and Essa Road) are expected to decline in volume after 2031. This would result in better operations at intersections along those road sections than is described in this report.

Signal timings at each intersection were adjusted as necessary to ensure optimal performance of each intersection was maintained at each horizon. A protected westbound left turn phase was required by the 2027 horizon at the intersection of Essa Road and Harvie Road to improve performance of the movement to an acceptable level.

As indicated, the study area intersections will continue to provide good operations (LOS D or better, overall) with individual movements providing acceptable operations (LOS E or better) through the 2041 horizon. It is noted that some movements may approach or slightly exceed capacity (v/c ≥ 1.00) by the 2036 horizon, however each intersection overall will operate at or below capacity (v/c ≤ 1.00) through the 2041 horizon.

Based on this assessment, no intersection improvements are required to accommodate the future background volumes.

Table 9: Intersection Operations – 2027 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Essa Road & Mapleview Drive	EB L	signal	21	C	0.39	32	C	0.65
	EB TR	signal	40	D	**0.87**	31	C	0.56
	WB L	signal	25	C	0.56	24	C	0.68
	WB T	signal	26	C	0.31	42	D	**0.91**
	WB R	free	24	C	0.07	24	C	0.22
	NB L	signal	25	C	0.14	27	C	0.20
	NB T	signal	27	C	0.34	32	C	0.52
	NB R	signal	24	C	0.13	26	C	0.16
	SB L	signal	19	B	0.37	19	B	0.44
	SB T	signal	19	B	0.28	21	C	0.37
	SB R	signal	17	B	0.09	19	B	0.19
	overall	signal	29	C	0.61	31	C	0.71
Mapleview Drive & Hollyholme Farm Road	EB L	signal	3	A	0.00	6	A	0.01
	EB TR	signal	5	A	0.35	7	A	0.29
	WB L	signal	4	A	0.06	6	A	0.01
	WB TR	signal	4	A	0.17	9	A	0.50
	NB L	signal	42	D	0.05	34	C	0.26
	NB TR	signal	43	D	0.01	37	D	0.01
	SB L	signal	43	D	0.01	43	D	0.02
	SB R	signal	44	D	0.00	44	D	0.00
	overall	signal	5	A	0.33	9	A	0.47

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Mapleview Drive & Veterans Drive	EB L	signal	19	B	0.29	44	D	0.80
	EB TR	signal	26	C	0.59	34	C	0.69
	WB L	signal	49	D	**0.89**	33	C	0.78
	WB TR	signal	23	C	0.37	38	D	**0.87**
	NB L	signal	21	C	0.23	32	C	0.71
	NB TR	signal	26	C	0.24	48	D	**0.87**
	SB L	signal	22	C	0.54	38	D	0.74
	SB TR	signal	27	C	0.45	37	D	0.60
	overall	signal	27	C	0.75	**38**	**D**	**0.86**
Essa Road & Mapleton Avenue	EB L	signal	40	D	0.81	42	D	**0.85**
	EB TR	signal	25	C	0.39	23	C	0.32
	WB L	signal	34	C	0.16	36	D	0.19
	WB TR	signal	38	D	0.48	52	D	0.79
	NB L	signal	9	A	0.06	19	B	0.51
	NB TR	signal	12	B	0.23	19	B	0.36
	SB L	signal	9	A	0.03	16	B	0.06
	SB TR	signal	13	B	0.31	29	C	0.74
	overall	signal	21	C	0.49	30	C	0.80
Essa Road & Harvie Road	EB L	signal	41	D	0.25	40	D	0.22
	EB TR	signal	43	D	0.45	41	D	0.38
	WB L	signal	32	C	0.47	54	D	**0.89**
	WB TR	signal	30	C	0.12	29	C	0.48
	NB L	signal	9	A	0.01	11	B	0.06
	NB TR	signal	12	B	0.33	16	B	0.48
	SB L	signal	7	A	0.11	9	A	0.23
	SB TR	signal	9	A	0.22	15	B	0.46
	overall	signal	16	B	0.37	23	C	0.63
Essa Road & Veterans Drive/ Ferndale Drive	EB L	signal	25	C	0.32	27	C	0.46
	EB TR	signal	43	D	**0.87**	29	C	0.60
	WB L	signal	27	C	0.19	22	C	0.16
	WB TR	signal	32	C	0.51	53	D	**0.97**
	NB L	signal	16	B	0.24	48	D	**0.85**
	NB TR	signal	21	C	0.28	30	C	0.36
	SB L	signal	14	B	0.47	29	C	0.66
	SB TR	signal	19	B	0.27	37	D	0.71
	overall	signal	29	C	0.62	**39**	**D**	**0.88**

Table 10: Intersection Operations – 2031 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Essa Road & Mapleview Drive	EB L	signal	21	C	0.42	37	D	0.71
	EB TR	signal	44	D	**0.91**	32	C	0.60
	WB L	signal	27	C	0.61	39	D	0.76
	WB T	signal	25	C	0.32	52	D	**0.97**
	WB R	free	23	C	0.08	24	C	0.24
	NB L	signal	26	C	0.16	28	C	0.23
	NB T	signal	29	C	0.38	34	C	0.58
	NB R	signal	25	C	0.14	27	C	0.19
	SB L	signal	19	B	0.43	21	B	0.51
	SB T	signal	19	B	0.32	22	C	0.41
	SB R	signal	18	B	0.10	19	B	0.23
	overall	signal	31	C	0.66	34	C	0.78
Mapleview Drive & Hollyholme Farm Road	EB L	signal	3	A	0.00	6	A	0.01
	EB TR	signal	5	A	0.38	8	A	0.31
	WB L	signal	4	A	0.07	6	A	0.01
	WB TR	signal	4	A	0.18	9	A	0.54
	NB L	signal	42	D	0.05	34	C	0.28
	NB TR	signal	43	D	0.01	37	D	0.01
	SB L	signal	43	D	0.01	43	D	0.02
	SB R	signal	44	D	0.00	44	D	0.00
	overall	signal	5	A	0.36	9	A	0.51
Mapleview Drive & Veterans Drive	EB L	signal	23	C	0.34	74	E	**0.94**
	EB TR	signal	33	C	0.71	37	D	0.75
	WB L	signal	47	D	**0.87**	52	D	**0.88**
	WB TR	signal	24	C	0.39	41	D	**0.92**
	NB L	signal	25	C	0.26	40	D	0.80
	NB TR	signal	30	C	0.27	62	E	**0.96**
	SB L	signal	22	C	0.57	40	D	0.77
	SB TR	signal	29	C	0.46	39	D	0.65
	overall	signal	30	C	0.78	**45**	**D**	**0.93**
Essa Road & Mapleton Avenue	EB L	signal	44	D	**0.85**	54	D	**0.91**
	EB TR	signal	25	C	0.41	24	C	0.33
	WB L	signal	34	C	0.17	37	D	0.20
	WB TR	signal	38	D	0.49	56	E	0.82
	NB L	signal	9	A	0.07	21	C	0.54

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
	NB TR	signal	12	B	0.25	19	B	0.38
	SB L	signal	10	A	0.03	17	B	0.07
	SB TR	signal	13	B	0.32	32	C	0.78
	overall	signal	21	C	0.51	33	C	0.84
Essa Road & Harvie Road	EB L	signal	41	D	0.27	40	D	0.23
	EB TR	signal	43	D	0.47	41	D	0.39
	WB L	signal	32	C	0.48	61	E	**0.93**
	WB TR	signal	30	C	0.12	29	C	0.50
	NB L	signal	9	A	0.01	11	B	0.06
	NB TR	signal	13	B	0.35	17	B	0.50
	SB L	signal	7	A	0.12	9	A	0.25
	SB TR	signal	9	A	0.23	15	B	0.48
	overall	signal	16	B	0.38	24	C	0.65
Essa Road & Veterans Drive/ Ferndale Drive	EB L	signal	25	C	0.36	31	C	0.55
	EB TR	signal	48	D	**0.92**	29	C	0.61
	WB L	signal	27	C	0.21	22	C	0.18
	WB TR	signal	32	C	0.54	54	D	**0.97**
	NB L	signal	16	B	0.26	68	E	**0.93**
	NB TR	signal	22	C	0.29	35	C	0.41
	SB L	signal	15	B	0.51	33	C	0.70
	SB TR	signal	19	B	0.28	45	D	0.79
	overall	signal	31	C	0.66	**44**	**D**	**0.92**

Table 11: Intersection Operations – 2036 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Essa Road & Mapleview Drive	EB L	signal	19	C	0.43	39	D	0.73
	EB TR	signal	43	D	**0.91**	32	C	0.62
	WB L	signal	32	C	0.67	31	C	0.79
	WB T	signal	27	C	0.35	58	E	**1.00**
	WB R	free	24	C	0.08	25	C	0.26
	NB L	signal	26	C	0.17	28	C	0.25
	NB T	signal	29	C	0.40	34	C	0.60
	NB R	signal	25	C	0.15	27	C	0.21
	SB L	signal	19	B	0.45	22	C	0.55
	SB T	signal	21	C	0.33	23	C	0.43
	SB R	signal	18	B	0.10	19	B	0.26
	overall	signal	31	C	0.68	**37**	**D**	0.81
Mapleview Drive & Hollyholme Farm Road	EB L	signal	3	A	0.00	6	A	0.02
	EB TR	signal	5	A	0.39	8	A	0.32
	WB L	signal	4	A	0.08	6	A	0.01
	WB TR	signal	4	A	0.18	9	A	0.55
	NB L	signal	42	D	0.05	34	C	0.29
	NB TR	signal	43	D	0.01	36	D	0.01
	SB L	signal	43	D	0.01	43	D	0.02
	SB R	signal	44	D	0.00	44	D	0.00
	overall	signal	5	A	0.37	9	A	0.52
Mapleview Drive & Veterans Drive	EB L	signal	22	C	0.34	60	E	**0.89**
	EB TR	signal	34	C	0.74	39	D	0.80
	WB L	signal	53	D	**0.90**	54	D	**0.89**
	WB TR	signal	26	C	0.42	54	D	**0.99**
	NB L	signal	24	C	0.28	45	D	**0.85**
	NB TR	signal	30	C	0.28	52	D	**0.91**
	SB L	signal	23	C	0.61	61	E	**0.91**
	SB TR	signal	29	C	0.48	37	D	0.63
	overall	signal	31	C	0.81	**49**	**D**	**0.97**
Essa Road & Mapleton Avenue	EB L	signal	56	E	**0.91**	52	D	**0.91**
	EB TR	signal	27	C	0.44	24	C	0.34
	WB L	signal	36	D	0.18	39	D	0.21
	WB TR	signal	40	D	0.53	63	E	**0.86**

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
	NB L	signal	9	A	0.07	28	C	0.62
	NB TR	signal	12	B	0.25	22	C	0.41
	SB L	signal	11	B	0.03	19	B	0.07
	SB TR	signal	14	B	0.33	24	C	0.81
	overall	signal	24	C	0.53	36	C	**0.87**
Essa Road & Harvie Road	EB L	signal	41	D	0.28	44	D	0.27
	EB TR	signal	43	D	0.49	46	D	0.46
	WB L	signal	32	C	0.49	40	D	0.80
	WB TR	signal	29	C	0.13	28	C	0.46
	NB L	signal	9	A	0.01	13	B	0.07
	NB TR	signal	13	B	0.36	19	B	0.53
	SB L	signal	7	A	0.12	12	B	0.28
	SB TR	signal	9	A	0.23	18	B	0.52
	overall	signal	16	B	0.40	23	C	0.64
Essa Road & Veterans Drive/ Ferndale Drive	EB L	signal	25	C	0.39	34	C	0.57
	EB TR	signal	52	D	**0.94**	32	C	0.67
	WB L	signal	27	C	0.22	22	C	0.20
	WB TR	signal	32	C	0.55	71	E	**1.03**
	NB L	signal	17	B	0.27	67	E	**0.93**
	NB TR	signal	22	C	0.30	34	C	0.41
	SB L	signal	16	B	0.53	34	C	0.73
	SB TR	signal	20	C	0.29	47	D	0.82
	overall	signal	33	C	0.69	**49**	**D**	**0.97**

Table 12: Intersection Operations – 2041 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Essa Road & Mapleview Drive	EB L	signal	19	B	0.44	41	D	0.75
	EB TR	signal	45	D	**0.93**	33	C	0.63
	WB L	signal	34	C	0.69	34	C	0.82
	WB T	signal	27	C	0.35	64	E	**1.02**
	WB R	free	24	C	0.08	25	C	0.28
	NB L	signal	26	C	0.19	28	C	0.27
	NB T	signal	30	C	0.42	34	C	0.63
	NB R	signal	26	C	0.16	27	C	0.23
	SB L	signal	21	C	0.48	24	C	0.59
	SB T	signal	21	C	0.35	23	C	0.46
	SB R	signal	18	B	0.11	21	C	0.28
	overall	signal	31	C	0.71	**39**	**D**	0.84
Mapleview Drive & Hollyholme Farm Road	EB L	signal	3	A	0.00	7	A	0.02
	EB TR	signal	5	A	0.40	8	A	0.33
	WB L	signal	4	A	0.08	6	A	0.01
	WB TR	signal	4	A	0.19	9	A	0.57
	NB L	signal	42	D	0.06	34	C	0.30
	NB TR	signal	43	D	0.01	36	D	0.01
	SB L	signal	43	D	0.01	43	D	0.02
	SB R	signal	44	D	0.00	44	D	0.00
	overall	signal	5	A	0.38	9	A	0.54
Mapleview Drive & Veterans Drive	EB L	signal	23	C	0.35	73	E	**0.93**
	EB TR	signal	34	C	0.76	43	D	0.81
	WB L	signal	57	E	**0.91**	60	E	**0.89**
	WB TR	signal	26	C	0.42	57	E	**0.99**
	NB L	signal	25	C	0.31	44	D	**0.84**
	NB TR	signal	30	C	0.30	70	E	**0.99**
	SB L	signal	24	C	0.65	60	E	**0.89**
	SB TR	signal	29	C	0.50	46	D	0.74
	overall	signal	32	C	0.84	**54**	**D**	**1.00**
Essa Road & Mapleton Avenue	EB L	signal	66	E	**0.96**	66	E	**0.97**
	EB TR	signal	27	C	0.46	24	C	0.35
	WB L	signal	36	D	0.19	38	D	0.22
	WB TR	signal	40	D	0.55	66	E	**0.88**

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
	NB L	signal	9	A	0.07	30	C	0.66
	NB TR	signal	12	B	0.27	24	C	0.45
	SB L	signal	11	B	0.03	19	B	0.08
	SB TR	signal	14	B	0.34	37	D	0.84
	overall	signal	26	C	0.55	**39**	**D**	**0.91**
Essa Road & Harvie Road	EB L	signal	41	D	0.29	45	D	0.28
	EB TR	signal	43	D	0.51	46	D	0.48
	WB L	signal	32	C	0.52	42	D	0.83
	WB TR	signal	29	C	0.13	29	C	0.48
	NB L	signal	9	A	0.01	13	B	0.07
	NB TR	signal	13	B	0.37	19	B	0.55
	SB L	signal	7	A	0.13	13	B	0.30
	SB TR	signal	9	A	0.24	18	B	0.53
	overall	signal	17	B	0.41	24	C	0.67
Essa Road & Veterans Drive/ Ferndale Drive	EB L	signal	25	C	0.42	34	C	0.57
	EB TR	signal	59	E	**0.98**	24	C	0.56
	WB L	signal	27	C	0.23	26	C	0.23
	WB TR	signal	32	C	0.58	72	E	**1.03**
	NB L	signal	17	B	0.28	70	E	**0.92**
	NB TR	signal	23	C	0.31	42	D	0.47
	SB L	signal	16	B	0.55	40	D	0.76
	SB TR	signal	21	C	0.30	62	E	**0.92**
	overall	signal	35	D	0.72	53	**D**	**0.96**

3.5.2 Queueing Operations

The queueing analysis was conducted using the average of five, 60-minute SimTraffic simulations for each peak hour, the results of which are provided in Table 13 and Table 14 with detailed worksheets provided in Appendix E.

As indicated, the length of turn lane storage within the network remains satisfactory through the 2041 horizon during the weekday AM peak hour, with only 2 lanes exceeding the 95th percentile queue (one of which being the eastbound left turn lane on Mapleton Avenue identified in Section 2.5.2). By the 2041 horizon during the weekday PM peak hour, however, many lanes do not have sufficient storage length to accommodate the 95th percentile queues, with shortfalls of up to 44 metres of storage. It is noted that the 50th percentile queue is satisfied in most cases, with only 3 lanes exceeding available storage by up to 11 metres.

Based on the queueing assessment, and considering practical and geometric constraints at some intersections, the recommended storage lengths at each horizon at each intersection are provided in Table 13 and Table 14.

Table 13: Queueing Operations – 2031 Background

INTERSECTION & MOVEMENTS		STORAGE LENGTH		AM PEAK HOUR QUEUES		PM PEAK HOUR QUEUES	
		Existing	Required	50th	95th	50th	95th
Essa Road & Mapleview Drive	EB L	80m	80m	21m	49m	20m	38m
	WB L	50	**80**	16	31	**52**	**89**
	NB L	60	60	8	18	13	32
	NB R	30	30	12	26	20	**53**
	SB L	50	50	25	46	25	45
Mapleview Drive & Hollyholme Farm Road	EB L	30	30	1	2	1	4
	WB L	30	30	2	8	1	3
	NB L	30	30	1	4	12	22
	SB L	40	40	1	2	1	4
Mapleview Drive & Veterans Drive	EB L	150	150	13	24	32	58
	WB L	80	80	26	58	53	**94**
	NB L	80	80	15	26	48	**85**
	SB L	140	140	36	59	38	64
Essa Road & Mapleton Avenue	EB L	40	40	40	**62**	**43**	**66**
	WB L	20	20	5	14	14	**37**
	NB L	40	40	6	14	16	27
	SB L	40	40	3	9	6	24
Essa Road & Harvie Road	EB L	40	40	6	15	3	9
	WB L	100	100	16	30	39	61
	NB L	40	40	1	1	1	4
	SB L	40	40	3	9	8	29
Essa Road & Veterans Drive/ Ferndale Drive	EB L	50	50	21	47	17	40
	WB L	70	70	6	16	26	**86**
	NB L	60	60	16	31	40	**68**
	SB L	70	70	28	49	43	**73**

Table 14: Queueing Operations – 2041 Background

INTERSECTION & MOVEMENTS		STORAGE LENGTH		AM PEAK HOUR QUEUES		PM PEAK HOUR QUEUES	
		Existing	Required	50th	Existing	Required	95th
Essa Road & Mapleview Drive	EB L	80m	80m	25m	56m	26m	47m
	WB L	50	**80**	16	32	**60**	**94**
	NB L	60	60	9	21	19	51
	NB R	30	30	12	28	27	**64**
	SB L	50	50	23	44	28	50
Mapleview Drive & Hollyholme Farm Road	EB L	30	30	1	2	1	5
	WB L	30	30	2	8	1	5
	NB L	30	30	1	5	13	25
	SB L	40	40	1	3	1	4
Mapleview Drive & Veterans Drive	EB L	150	150	14	27	44	84
	WB L	80	**90**	41	66	64	**113**
	NB L	80	80	15	27	64	**110**
	SB L	140	140	41	70	55	98
Essa Road & Mapleton Avenue	EB L	40	40	**47**	**69**	**47**	**69**
	WB L	20	20	5	14	17	**41**
	NB L	40	40	7	17	20	39
	SB L	40	40	4	11	7	30
Essa Road & Harvie Road	EB L	40	40	5	13	4	10
	WB L	100	100	18	35	45	70
	NB L	40	40	1	2	1	4
	SB L	40	40	4	10	10	31
Essa Road & Veterans Drive/ Ferndale Drive	EB L	50	50	25	**60**	21	46
	WB L	70	70	7	15	29	**90**
	NB L	60	**70**	16	31	50	**85**
	SB L	70	**90**	29	50	57	**98**

3.5.3 Operational Summary

Based on the results of the operational analyses conducted under future background conditions, the network is expected to provide acceptable operations through the 2041 horizon. Adjustments to signal timing plans at each intersection and lengthening of storage lanes for turning movements at some intersections will be required to accommodate the future background volumes. It is recommended that the upgrades identified for Essa Road in Section 3.1 be implemented by 2031 to accommodate projected increases in traffic volumes.

4 Proposed Development

This chapter will provide additional details with report to the proposed development, including its location, land-use, site access, trips generated and assignment of said trips to the adjacent road network.

4.1 LOCATION

The subject site is located in the northeast quadrant of the intersection of Essa Road and Mapleview Drive in the City of Barrie (as illustrated in Figure 1). The site is approximately 10.2 ha in size and consists of the properties known municipally as 664 Essa Road, 674 Essa Road, 692 Essa Road, and 320 Mapleview Drive. The site is bounded by Holy Spirit Parish (550 Essa Road) to the north, Mapleview Drive to the south, Mapleview Community Church (300 Mapleview Drive) to the east and Essa Road to the west.

A protected watercourse bisects the site, running approximately east to west across the centre of the 674 Essa Road property. This functionally divides the site into two distinct sections – a North Block and South Block.

4.2 LAND-USE & PHASING

The proposed development is divided into 9 lettered development zones (Zones A to I), details of which are summarized in Table 15, with a site plan provided in Figure 12. Zones A to C are located in the South Block of the subject site, whereas zones D through I are located in the North Block. In total, the development will contain:

- 1,217 residential units;
- 2,661 m^2 of retail space;
- a 162 m^2 daycare; and
- a 653 m^2 library.

Per communications with the client, it is assumed that the North Block (i.e. Zones D to I) will begin construction in 2025 with a unit uptake rate of approximately 200 units per year (the historical uptake rate within the City of Barrie). Upon completion of the North Block, the South Block (Zones A to C) will begin construction. Based on the noted unit uptake rate, completion of the North Block and South Block are expected in 2027 and 2031, respectively.

Table 15: Site Land-Use & Phasing

BLOCK	ZONE	LAND USE	SIZE	BUILD-OUT
North	D	townhouses, live-work	19 units	2027
	E	townhouses, traditional	30 units	2027
	F	townhouses, stacked back-to-back	132 units	2027
	G	townhouses, stacked back-to-back	128 units	2027
	H	townhouses, stacked back-to-back	132 units	2027
	I	townhouses, traditional	25 units	2027
South	A	residential, mid-rise residential, high-rise retail	110 units 315 units 2,432 m^2	2031
	B	residential, mid-rise	209 units	2031
	C	residential, mid-rise daycare library retail	119 units 162 m^2 653 m^2 230 m^2	2031

4.3 ACCESS & ON-SITE CIRCULATION

Access

External access to the surrounding road network will be provided by 3 access points.

- The North Access will be located on Essa Road near the north boundary of the site.
- The MCC Access will be shared with the existing access to the Mapleview Community Church located on Mapleview Drive, opposite Hollyholme Farm Road.
- The West Access will be located on Mapleview Drive, approximately 200 metres west of the MCC access.

The North Access and MCC Access will be configured for full moves, whereas the West Access will be configured as a right-in, right-out access (i.e. allows right turns only). Traffic signals are currently present at the MCC Access; the North Access and West Access are assumed to operate under stop control. Each access will be constructed according to the Transportation Association of Canada (TAC) standards for a commercial access point (the City of Barrie Engineering Standards adhere to TAC standards) to allow for safe and efficient two-way operations.

Pedestrian and cycling access to the site will be provided by multiple connections to the external sidewalk/trail network along the site frontage on Essa Road and Mapleview Drive.

Circulation

Circulation within the site will be provided by a series of new private roads and laneways built within the site. Each road/laneway will be a minimum of 6.0 metres wide with 12-metre centreline curve radii, allowing for two-way operations and satisfying the requirements of the Ontario Building Code for a fire route. Roads intended to allow on-street parking will be a minimum of 9.0 metres wide, providing a 2.6-metre-wide parking lane and 6.4-metre wide travel lane.

A vehicle turning assessment was completed to ensure that sufficient manoeuvring room is provided for typical design vehicles, such as medium single-unit trucks (i.e. delivery and moving trucks), garbage trucks, and fire trucks. Results of the turning assessment are provided in Appendix F. As indicated, sufficient manoeuvring space is provided within the site for the noted design vehicles.

Pedestrian circulation within the site will be provided by an internal sidewalk network adjacent to each internal road, plus dedicated pedestrian walkways within the stacked townhouse zones.

4.4 PARKING

Table 16 summarizes the parking supply rate and total provision for each land-use on site. Per communications with City staff, the provided rates are considered acceptable.

Table 16: Parking Rates & Supply

LAND-USE	SIZE	SUPPLY RATE	TOTAL SUPPLY
townhouses, live-work	19 units	1.5 spaces per unit	29 spaces
townhouses, traditional & stacked back-to-back	447 units	1.25 spaces per unit	559 spaces
residential, mid-rise & high-rise	753 units	1.0 spaces per unit	761 spaces
retail	2,490 m^2 GFA	1 space per 30 m^2 GFA	84 spaces
library	653 m^2 GFA	1 space per 30 m^2 GFA	22 spaces
daycare	162 m^2 GFA	-	2 spaces
Total			**1,457 spaces**

4.5 SITE TRAFFIC

4.5.1 Trip Generation

The number of vehicle trips to be generated by the proposed development for the weekday AM and weekday PM peak hours has been determined based on type of use, development size and trip generation rates per the *ITE Trip Generation Manual*. Based on the developments proposed for each parcel, the following ITE land uses have been applied:

- single family attached;
- multifamily housing – low-rise, not close to rail transit;
- multifamily housing – mid-rise, not close to rail transit;
- multifamily housing – high-rise, not close to rail transit;
- day care centre;
- library; and
- strip retail plaza (<40,000 ft^2).

Trip rates for each of the above noted land uses are summarized in Table 17 with associated trip estimates provided in Table 18.

Table 17: Trip Rates – Mapleview & Essa Development

LAND USE	ITE LAND-USE CODE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			In	Out	Total	In	Out	Total
single family attached	215	units	0.15	0.33	0.48	0.32	0.25	0.57
multifamily housing – low-rise	220	units	0.10	0.30	0.40	0.32	0.19	0.51
multifamily housing – mid-rise	221	units	0.09	0.28	0.37	0.24	0.15	0.39
multifamily housing – high-rise	222	units	0.09	0.18	0.27	0.18	0.14	0.32
day care centre	565	1000 ft^2 GFA	5.83	5.17	11.00	5.23	5.89	11.12
library	590	1000 ft^2 GFA	0.71	0.29	1.00	3.92	4.24	8.16
strip retail plaza (<40,000 ft^2)	822	1000 ft^2 GLA	1.42	0.94	2.36	3.30	3.30	6.59

It is noted that all South Block buildings (ranging from 6 to 12 stories tall) are considered mid-rise buildings for planning purposes. The *Trip Generation Manual*, however, defines any residential building from 4 to 10 stories as mid-rise and any residential building taller than 10 stories as high-rise, with distinct trip generation rates for each. For the purposes of the trip generation calculations, this distinction has been maintained – any units located in a building 10 stories or less are treated as mid-rise units and any units in the 12 storey building are treated as high-rise units.

Table 18: Gross Trip Estimates – Mapleview & Essa Development

ZONE	LAND USE	ITE LAND-USE CODE	SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
				In	Out	Total	In	Out	Total
North Block				**48**	**143**	**191**	**148**	**92**	**240**
D	townhouses, live-work	215	19 units	3	6	9	6	5	11
E	townhouses, traditional	215	30 units	4	10	14	10	7	17
F	townhouses, stacked	220	130 units	12	40	53	41	25	66
G	townhouses, stacked	220	128 units	12	39	51	41	24	65
H	townhouses, stacked	220	132 units	13	40	53	42	25	67
I	townhouses, traditional	215	25 units	4	8	12	8	6	14
South Block				**121**	**219**	**340**	**290**	**245**	**535**
A	residential, mid-rise	221	110 units	9	31	40	26	17	43
	residential, high-rise	222	315 units	29	56	85	56	44	100
	retail	822	26,177 ft^2	37	25	62	86	86	172
B	residential, mid-rise	221	209 units	17	60	77	50	32	82
C	residential, mid-rise	221	119 units	10	34	44	28	18	46
	daycare	565	1,744 ft^2	10	9	19	9	10	19
	library	590	7,029 ft^2	5	2	7	27	29	56
	retail	822	2,472 ft^2	4	2	6	8	8	16
Total				**170**	**361**	**531**	**438**	**337**	**775**

As indicated, the combined generation of each use within the subject site is 531 trips during the weekday AM peak hour and 775 trips during the weekday PM peak hour.

It is noted that not all of these trips are expected to be new trips on the network. Interactions between the various residential, commercial/retail, and community uses on-site will result in internal trips contained entirely within the development. To account for internal trips, a 10% trip reduction was applied to all uses within the South Block. While the North Block will consist of entirely residential uses (which do not generate significant internal trips), it is recognized that some internal trips may be generated between the North Block and South Block. To remain conservative however, no internal trip reduction has been applied to the North Block uses.

In addition to internal trips, the commercial/retail uses in the South Block are expected to generate pass-by trips – trips which are already on the road network for another purpose which will stop at the subject site before continuing to their destination. Per pass-by rates contained within the *ITE Trip Generation Handbook*[9], a 34% pass-by rate has been applied to the weekday PM peak volumes (pass-by rates are not provided for the weekday AM peak, and given the anticipated commercial hours of operations, such would not likely occur during the AM peak hour of the road).

A summary of the trip estimates and the resulting net trip generation is provided in Table 19.

Table 19: Net Trip Estimates – Mapleview & Essa Development

TRIP TYPE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
	In	Out	Total	In	Out	Total
Gross Trips	171	361	532	439	337	776
Internal Trips	12	22	34	29	24	53
Pass-by Trips	-	-	-	32	32	64
Net (New) Trips	**159**	**339**	**498**	**378**	**281**	**659**

4.5.2 Trip Modal Split

Modal split is the distribution of trips to/from a specific area or location across different modes of transportation, such as automobiles, public transit, walking, etc. Data from the 2016 *Transportation Tomorrow Survey* (TTS) was used to determine the existing modal split in the area. The TTS is comprehensive travel survey conducted every 5 years in the Greater Golden Horseshoe which can be used to identify the primary mode of transportation used for a trip between two *zones* in order to determine the modal split within one or more zones.

[9] *Trip Generation Handbook, 3rd Edition*. Institute of Transportation Engineers. September 2017.

Regarding the subject development, it is located within *2006 GTA Zone* 8524, which covers a roughly triangular area between Essa Road, Highway 400 and the former City of Barrie south limits. Zone 8524 consists almost entirely of commercial and industrial developments, thus it was realized that trip distribution within this zone may not accurately reflect the trip distribution expected for the subject development (which is largely residential). Therefore, the trip distribution for Zone 8523 (which begins immediately east of the subject site) was used instead. Zone 8523 is largely residential and covers an approximately trapezoidal area between Essa Road, Harvie Road and the south and west City limits. Trips to and from Zone 8523 were separated by type to determine the proportion of each type of trip. The following modal split was realized:

- public transit (local, GO train, or both) – 1.8%;
- active transportation (walking, cycling, etc.) – 3.7%; and
- automobile (driver or passenger) – 94.5%;

As indicated, approximately 94.5% of all trips used a personal automobile to complete the trip, either as a driver or passenger. It is noted that the above modal split excludes home based school trips; the presence of several schools within Zone 8523 and adjacent zones (and associated trips made by students) was found to substantially increase the number of non-auto trips. Since most school aged children are unable to drive (thus most will walk or ride a school bus to/from school), the subsequent increase in non-auto modes was considered to be an inaccurate representation of the zone's true modal split.

The City's TMP identifies a City-wide modal split target of 7% public transit and 12% active transportation by 2041, resulting in a total non-automobile modal share of 19% of all trips city-wide. Based on the proposed transit improvements identified in Section 3.3 and expansion of the City's active transportation network (more sidewalks and bicycle infrastructure) identified in the City's TMP, it is considered reasonable that the City's modal split targets can be achieved by the 2041 horizon. For the interim horizon years, modal split proportions have been linearly interpolated between the current modal split and target split values. The modal split applied at each horizon is summarized in Table 20.

Table 20: Modal Splits

YEAR	PUBLIC TRANSIT	ACTIVE TRANSPORTATION	AUTOMOBILE
2022	1.8%	3.7%	94.5%
2027	3.1%	5.9%	91.0%
2031	4.2%	7.6%	88.1%
2036	5.6%	9.8%	84.6%
2041	7%	12%	81%

Applying the above rates to the trip generation determined in Section 4.5.1, the total automobile and non-automobile trips generated by the site can be determined at each horizon. Modal trip generation is summarized in Table 21.

Table 21: Modal Trip Estimates – Mapleview & Essa Development

YEAR	PUBLIC TRANSIT TRIPS		ACTIVE TRANSPORTATION TRIPS		AUTOMOBILE TRIPS	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
2027	6	8	11	14	174	219
2031	23	33	41	59	435	568
2036	30	44	52	76	416	540
2041	37	54	64	93	397	512

Given the expected 2041 peak transit trip generation of 54 peak hour trips (split between inbound and outbound trips), plus additional transit capacity added by the proposed increases to transit frequency, significant capacity is expected to remain available through future horizon years.

4.5.3 Trip Distribution & Assignment

The distribution of new trips generated by the site has been developed based on trip distribution data provided in the 2016 TTS. In addition to the use identified in Section 4.5.2, the TTS can also be used to identify travel patterns between different zones within the study area, determining how many trips are travelling between zones of interest.

In the case of the subject development (assessed within *2006 GTA Zone* 8523), approximately 69% of all trips to and from this zone were found to be trips made internally within the City of Barrie, thus 31% of all trips to and from this zone are trips made outside Barrie. The overall directional distribution of trips to and from the zone was realized:

- to/from the north – 41% (34% internal, 7% external);
- to/from the south – 20% (7% internal, 13% external);
- to/from the east – 28% (28% internal, 0% external); and
- to/from the west – 11% (7% internal, 4% external).

Based on the above, in consideration of expected travel routes and the location of the site in relation to Zone 8523 (at the far east edge), the following assignment was applied to new site-generated trips:

- to/from the north – 40%;
  - Highway 400 via Mapleview Drive – 8%;
  - via Essa Road – 32%;
- to/from the south – 30%;
  - Highway 400 via Mapleview Drive – 15%;
  - via Essa Road – 6%;
  - via Veterans Drive – 9%;
- to/from the east – 20%; and
  - via Mapleview Drive – 12%;
  - via Harvie Road – 8%; and
- to/from the west via Mapleview Drive – 10%.

The site trips were subsequently assigned to the road system in consideration of the above noted distribution, the location of the corresponding land uses within the site, proximity of the site access and configuration of such. The resulting assignments are illustrated in Figure 13 through Figure 16 for the future horizons considered.

Pass-By Trips

As previously indicated, pass-by trips are those trips already on the road network which are expected to stop at the subject site as they travel past. The distribution of these pass-by trips is proportional to the directional volumes present on Mapleview Drive during the weekday PM peak

hour (the commercial space fronts Mapleview Drive, thus it is expected that pass-by trips are generated from traffic on Mapleview Drive). The largest approach volume past the site will generate the largest number of pass-by trips. The following distribution was realized:

- from the east – 66%; and
- from the west – 34%.

Pass-by distribution is illustrated in Figure 17.

Total Trips

The resulting total site-generated volumes (new trips at each horizon + pass-by trips) assigned to the adjacent road network are illustrated in Figure 18 through Figure 21.

5 Future Total Conditions

This chapter will address the resulting impacts of the proposed development on the adjacent road system. The following areas will be addressed:

- operations of the key intersections;
- queueing at key intersections;
- available sight lines at the proposed access points; and
- potential improvements to the study area road network, if necessary.

5.1 TRAFFIC VOLUMES

To assess the impacts of the increased traffic volumes resulting from the proposed development, the site-generated traffic volumes at each horizon were added to the respective 2027, 2031, 2036 and 2041 background traffic volumes. The resulting total traffic volumes are illustrated in Figure 22 through Figure 25.

5.2 TRAFFIC OPERATIONS

Analysis of the key intersections was repeated for each horizon to assess the impact of the proposed development. Vehicle queueing was reviewed under the 2031 and 2041 horizons, as they represent the ultimate traffic condition at build-out and 10 years beyond build-out of the subject site (i.e. the worst-case scenario on the road network).

5.2.1 Intersection Operations

For the signalized intersections, the signal timings were adjusted at each horizon as needed to ensure acceptable intersection performance was maintained. For the unsignalized North Access, traffic signal warrants were completed, as provided in Appendix H. Based on the warrants, traffic signals are not required at the North Access.

The resulting operations of each intersection, including the site access intersections, are summarized in Table 22 through Table 25 whereas detailed operations worksheets are provided in Appendix G. As indicated, the operations of each of the key intersections under total conditions do not differ significantly from their operations under background conditions. Each intersection and individual movement continue to provide acceptable operations (LOS E or better) through the 2041 horizon, with most operating at or under capacity ($v/c \leq 1.00$). The intersection of Mapleview with Veterans Drive is expected to operate over capacity ($v/c > 1.00$) by 2036, largely due to the westbound through-right movement also operating over capacity. A

dedicated westbound right turn lane is not recommended as this would further increase pedestrian crossing times (thus require signal adjustments which would increase delays on other movements). It is noted that the City's EMME model projects traffic volumes to decline on Mapleview Drive after 2031, which would likely mitigate the capacity concerns at the intersection.

Each site access is expected to provide good operations (LOS D or better) through the 2041 horizon.

Table 22: Intersection Operations – 2027 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Essa Road & Mapleview Drive	EB L	signal	21	C	0.39	34	C	0.69
	EB TR	signal	40	D	**0.87**	31	C	0.57
	WB L	signal	26	C	0.57	25	C	0.69
	WB T	signal	26	C	0.31	43	D	**0.91**
	WB R	free	24	C	0.08	24	C	0.22
	NB L	signal	25	C	0.14	27	C	0.20
	NB T	signal	27	C	0.34	32	C	0.53
	NB R	signal	24	C	0.13	26	C	0.16
	SB L	signal	19	B	0.37	19	B	0.44
	SB T	signal	19	B	0.29	21	C	0.38
	SB R	signal	17	B	0.10	19	B	0.20
	overall	signal	29	C	0.61	31	C	0.72
Mapleview Drive & Hollyholme Farm Road	EB L	signal	5	A	0.01	6	A	0.08
	EB TR	signal	7	A	0.38	7	A	0.29
	WB L	signal	5	A	0.07	5	A	0.01
	WB TR	signal	6	A	0.19	9	A	0.52
	NB L	signal	41	D	0.05	34	C	0.27
	NB TR	signal	42	D	0.01	41	D	0.01
	SB L	signal	34	C	0.17	39	D	0.16
	SB R	signal	38	D	0.01	44	D	0.01
	overall	signal	8	A	0.36	9	A	0.49
Mapleview Drive & Veterans Drive	EB L	signal	21	C	0.30	44	D	0.80
	EB TR	signal	29	C	0.65	34	C	0.71
	WB L	signal	32	C	0.79	38	D	0.80
	WB TR	signal	23	C	0.36	40	D	**0.90**
	NB L	signal	22	C	0.26	34	C	0.74
	NB TR	signal	27	C	0.24	48	D	**0.87**

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
	SB L	signal	24	C	0.56	38	D	0.74
	SB TR	signal	29	C	0.45	37	D	0.60
	overall	signal	27	C	0.72	**39**	**D**	**0.88**
Essa Road & Mapleton Avenue	EB L	signal	40	D	0.81	42	D	**0.85**
	EB TR	signal	25	C	0.39	23	C	0.32
	WB L	signal	34	C	0.16	36	D	0.19
	WB TR	signal	38	D	0.48	52	D	0.79
	NB L	signal	9	A	0.06	22	C	0.55
	NB TR	signal	12	B	0.26	19	B	0.38
	SB L	signal	9	A	0.03	16	B	0.06
	SB TR	signal	13	B	0.32	31	C	0.79
	overall	signal	21	C	0.50	31	C	0.83
Essa Road & Harvie Road	EB L	signal	41	D	0.26	40	D	0.22
	EB TR	signal	43	D	0.46	41	D	0.38
	WB L	signal	32	C	0.48	54	D	**0.90**
	WB TR	signal	30	C	0.12	29	C	0.47
	NB L	signal	9	A	0.01	11	B	0.06
	NB TR	signal	12	B	0.37	17	B	0.51
	SB L	signal	7	A	0.12	9	A	0.25
	SB TR	signal	9	A	0.22	15	B	0.49
	overall	signal	16	B	0.40	23	C	0.65
Essa Road & Veterans Drive/ Ferndale Drive	EB L	signal	25	C	0.32	27	C	0.46
	EB TR	signal	43	D	**0.87**	29	C	0.60
	WB L	signal	27	C	0.19	22	C	0.16
	WB TR	signal	32	C	0.51	53	D	**0.97**
	NB L	signal	16	B	0.24	61	E	**0.91**
	NB TR	signal	21	C	0.31	30	C	0.39
	SB L	signal	15	B	0.50	30	C	0.68
	SB TR	signal	19	B	0.28	39	D	0.75
	overall	signal	29	C	0.64	**40**	**D**	**0.91**
Essa Road & North Access	WB LR	stop	14	B	0.14	29	D	0.21
	SB L	free	9	A	0.02	11	B	0.08

Table 23: Intersection Operations – 2031 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Essa Road & Mapleview Drive	EB L	signal	22	C	0.45	42	D	0.77
	EB TR	signal	44	D	**0.92**	32	C	0.62
	WB L	signal	30	C	0.67	29	D	0.77
	WB T	signal	25	C	0.34	49	D	**0.96**
	WB R	free	23	C	0.12	25	C	0.32
	NB L	signal	26	C	0.16	29	C	0.24
	NB T	signal	29	C	0.38	34	C	0.61
	NB R	signal	25	C	0.15	28	C	0.22
	SB L	signal	19	B	0.43	22	C	0.53
	SB T	signal	21	C	0.33	23	C	0.43
	SB R	signal	18	B	0.11	21	C	0.25
	overall	signal	31	C	0.67	34	C	0.79
Mapleview Drive & Hollyholme Farm Road	EB L	signal	6	A	0.04	9	A	0.01
	EB TR	signal	8	A	0.43	8	A	0.31
	WB L	signal	6	A	0.09	8	A	0.01
	WB TR	signal	7	A	0.23	14	B	0.64
	NB L	signal	40	D	0.04	42	D	0.41
	NB TR	signal	42	D	0.01	46	D	0.01
	SB L	signal	33	C	0.31	34	C	0.24
	SB R	signal	36	D	0.00	43	D	0.01
	overall	signal	9	A	0.42	14	B	0.57
Mapleview Drive & Veterans Drive	EB L	signal	23	C	0.36	57	E	**0.87**
	EB TR	signal	36	D	0.80	39	D	0.82
	WB L	signal	52	D	**0.89**	53	D	**0.88**
	WB TR	signal	25	C	0.41	57	E	**1.00**
	NB L	signal	25	C	0.30	51	D	**0.89**
	NB TR	signal	30	C	0.27	54	D	**0.92**
	SB L	signal	22	C	0.57	48	D	0.83
	SB TR	signal	29	C	0.46	39	D	0.65
	overall	signal	31	C	0.79	**50**	**D**	**0.98**
Essa Road & Mapleton Avenue	EB L	signal	44	D	**0.85**	54	D	**0.91**
	EB TR	signal	25	C	0.41	24	C	0.33
	WB L	signal	34	C	0.17	37	D	0.20
	WB TR	signal	38	D	0.49	56	E	0.82

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
	NB L	signal	9	A	0.07	24	C	0.56
	NB TR	signal	13	B	0.32	21	C	0.45
	SB L	signal	10	A	0.03	17	B	0.08
	SB TR	signal	14	B	0.36	39	D	**0.90**
	overall	signal	21	C	0.54	**36**	**D**	**0.91**
Essa Road & Harvie Road	EB L	signal	41	D	0.27	44	D	0.24
	EB TR	signal	42	D	0.46	46	D	0.44
	WB L	signal	32	C	0.51	42	D	0.82
	WB TR	signal	29	C	0.12	28	C	0.44
	NB L	signal	9	A	0.01	14	B	0.08
	NB TR	signal	14	B	0.43	21	B	0.59
	SB L	signal	7	A	0.14	13	B	0.31
	SB TR	signal	9	A	0.25	19	B	0.57
	overall	signal	16	B	0.45	24	C	0.69
Essa Road & Veterans Drive/ Ferndale Drive	EB L	signal	25	C	0.36	32	C	0.55
	EB TR	signal	48	D	**0.92**	30	C	0.63
	WB L	signal	27	C	0.21	23	C	0.19
	WB TR	signal	32	C	0.54	61	E	**0.99**
	NB L	signal	16	B	0.26	76	E	**0.95**
	NB TR	signal	23	C	0.37	37	D	0.49
	SB L	signal	16	B	0.57	34	C	0.74
	SB TR	signal	19	B	0.31	51	D	**0.89**
	overall	signal	31	C	0.70	**48**	**D**	**0.94**
Mapleview Drive & West Access	SB R	stop	9	A	0.11	9	A	0.09
Essa Road & North Access	WB LR	stop	12	B	0.13	14	C	0.15
	SB L	free	9	A	0.06	12	A	0.20

Table 24: Intersection Operations – 2036 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Essa Road & Mapleview Drive	EB L	signal	19	C	0.45	45	D	0.79
	EB TR	signal	43	D	**0.92**	33	C	0.64
	WB L	signal	36	D	0.73	36	C	0.83
	WB T	signal	27	C	0.37	62	E	**1.01**
	WB R	free	25	C	0.12	25	C	0.34
	NB L	signal	26	C	0.18	28	C	0.25
	NB T	signal	29	C	0.40	34	C	0.61
	NB R	signal	26	C	0.15	27	C	0.23
	SB L	signal	19	B	0.45	22	C	0.55
	SB T	signal	21	C	0.34	23	C	0.44
	SB R	signal	18	B	0.11	19	B	0.27
	overall	signal	31	C	0.69	**39**	**D**	0.83
Mapleview Drive & Hollyholme Farm Road	EB L	signal	6	A	0.04	9	A	0.33
	EB TR	signal	8	A	0.44	8	A	0.31
	WB L	signal	6	A	0.09	7	A	0.01
	WB TR	signal	7	A	0.23	14	B	0.65
	NB L	signal	40	D	0.04	40	D	0.35
	NB TR	signal	42	D	0.01	44	D	0.01
	SB L	signal	33	C	0.30	37	D	0.28
	SB R	signal	36	D	0.01	43	D	0.01
	overall	signal	9	A	0.43	14	B	0.57
Mapleview Drive & Veterans Drive	EB L	signal	23	C	0.35	60	E	**0.89**
	EB TR	signal	37	C	0.83	42	D	**0.87**
	WB L	signal	54	D	**0.90**	56	E	**0.89**
	WB TR	signal	26	C	0.45	73	E	**1.05**
	NB L	signal	25	C	0.32	62	E	**0.94**
	NB TR	signal	30	C	0.28	52	D	**0.91**
	SB L	signal	23	C	0.61	61	E	**0.91**
	SB TR	signal	29	C	0.48	37	D	0.63
	overall	signal	32	C	0.81	**56**	**D**	**1.02**
Essa Road & Mapleton Avenue	EB L	signal	36	D	0.77	52	D	**0.91**
	EB TR	signal	26	C	0.39	24	C	0.34
	WB L	signal	39	D	0.19	39	D	0.21
	WB TR	signal	43	D	0.55	63	E	**0.86**

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
	NB L	signal	9	A	0.08	29	C	0.62
	NB TR	signal	14	B	0.33	23	C	0.47
	SB L	signal	12	B	0.04	19	B	0.08
	SB TR	signal	16	B	0.38	44	D	**0.92**
	overall	signal	21	C	0.53	**39**	**D**	**0.92**
Essa Road & Harvie Road	EB L	signal	41	D	0.28	45	D	0.27
	EB TR	signal	43	D	0.49	46	D	0.46
	WB L	signal	33	C	0.53	44	D	0.85
	WB TR	signal	29	C	0.13	28	C	0.45
	NB L	signal	9	A	0.01	14	B	0.08
	NB TR	signal	14	B	0.44	21	C	0.60
	SB L	signal	7	A	0.14	13	B	0.32
	SB TR	signal	9	A	0.25	19	B	0.58
	overall	signal	17	B	0.46	25	C	0.71
Essa Road & Veterans Drive/ Ferndale Drive	EB L	signal	25	C	0.39	34	C	0.58
	EB TR	signal	52	D	**0.94**	32	C	0.67
	WB L	signal	27	C	0.22	23	C	0.20
	WB TR	signal	32	C	0.55	74	E	**1.04**
	NB L	signal	17	B	0.28	68	E	**0.92**
	NB TR	signal	23	C	0.37	34	C	0.47
	SB L	signal	17	B	0.59	40	D	0.79
	SB TR	signal	21	C	0.32	57	E	**0.93**
	overall	signal	32	C	0.73	**54**	**D**	**0.97**
Mapleview Drive & West Access	SB R	stop	9	A	0.10	9	A	0.09
Essa Road & North Access	WB LR	stop	12	B	0.12	14	C	0.15
	SB L	free	9	A	0.06	12	B	0.19

Table 25: Intersection Operations – 2041 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Essa Road & Mapleview Drive	EB L	signal	19	B	0.46	47	D	0.80
	EB TR	signal	45	D	**0.93**	33	C	0.66
	WB L	signal	38	D	0.74	40	D	0.86
	WB T	signal	27	C	0.37	68	E	**1.03**
	WB R	free	25	C	0.12	26	C	0.37
	NB L	signal	27	C	0.19	29	C	0.27
	NB T	signal	30	C	0.42	36	D	0.64
	NB R	signal	26	C	0.18	28	C	0.25
	SB L	signal	21	C	0.48	24	C	0.60
	SB T	signal	21	C	0.36	23	C	0.46
	SB R	signal	18	B	0.11	21	C	0.29
	overall	signal	32	C	0.72	**41**	**D**	**0.86**
Mapleview Drive & Hollyholme Farm Road	EB L	signal	6	A	0.04	9	A	0.32
	EB TR	signal	9	A	0.45	8	A	0.32
	WB L	signal	6	A	0.09	8	A	0.01
	WB TR	signal	7	A	0.23	14	B	0.66
	NB L	signal	40	D	0.06	37	D	0.30
	NB TR	signal	43	D	0.01	44	D	0.01
	SB L	signal	34	C	0.29	39	D	0.30
	SB R	signal	37	D	0.01	45	D	0.01
	overall	signal	9	A	0.43	14	B	0.58
Mapleview Drive & Veterans Drive	EB L	signal	23	C	0.35	74	E	**0.93**
	EB TR	signal	39	C	0.84	46	D	**0.87**
	WB L	signal	41	E	0.83	60	E	**0.89**
	WB TR	signal	25	C	0.43	74	E	**1.05**
	NB L	signal	26	C	0.35	54	D	**0.91**
	NB TR	signal	32	C	0.31	70	E	**0.99**
	SB L	signal	27	C	0.67	61	E	**0.89**
	SB TR	signal	32	C	0.55	47	D	0.75
	overall	signal	33	C	0.81	**62**	**D**	**1.04**
Essa Road & Mapleton Avenue	EB L	signal	37	D	0.80	66	E	**0.97**
	EB TR	signal	26	C	0.41	24	C	0.35
	WB L	signal	39	D	0.20	38	D	0.22
	WB TR	signal	43	D	0.57	66	E	**0.88**

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
	NB L	signal	11	B	0.09	32	C	0.66
	NB TR	signal	15	B	0.35	25	C	0.51
	SB L	signal	13	B	0.04	19	B	0.09
	SB TR	signal	17	B	0.39	49	D	**0.95**
	overall	signal	22	C	0.55	**44**	**D**	**0.97**
Essa Road & Harvie Road	EB L	signal	41	D	0.29	45	D	0.28
	EB TR	signal	43	D	0.51	46	D	0.48
	WB L	signal	33	C	0.56	48	D	0.88
	WB TR	signal	29	C	0.13	28	C	0.47
	NB L	signal	9	A	0.01	14	B	0.09
	NB TR	signal	14	B	0.44	22	C	0.61
	SB L	signal	7	A	0.15	14	B	0.34
	SB TR	signal	9	A	0.26	19	B	0.59
	overall	signal	17	B	0.47	26	C	0.73
Essa Road & Veterans Drive/ Ferndale Drive	EB L	signal	24	C	0.40	46	D	0.70
	EB TR	signal	48	D	**0.93**	25	C	0.57
	WB L	signal	26	C	0.23	26	C	0.24
	WB TR	signal	31	C	0.55	67	E	**1.02**
	NB L	signal	17	B	0.30	71	E	**0.92**
	NB TR	signal	23	C	0.38	41	D	0.52
	SB L	signal	21	C	0.65	45	D	0.82
	SB TR	signal	22	C	0.34	76	E	**1.00**
	overall	signal	32	C	0.76	54	**D**	**0.98**
Mapleview Drive & West Access	SB R	stop	9	A	0.10	9	A	0.09
Essa Road & North Access	WB LR	stop	12	B	0.12	15	C	0.14
	SB L	free	9	A	0.06	12	B	0.28

5.2.2 Queueing Operations

The results of the queueing analysis for the 2031 and 2041 horizon years are summarized in Table 26 and Table 27 with detailed worksheets provided in Appendix G. Storage lengths recommended under background conditions were used in the assessment under total conditions.

As indicated, queues within the network are comparable to those observed under background conditions. Most variation between background and total conditions is a result of modifications to signal timing plans. Average queues during both peak periods and 95th percentile queues

during the weekday AM peak period remain within the available storage length at each intersection. While many 95th percentile queues exceed the available storage by 2041 during the weekday PM peak hour, as noted in Section 3.5.2, practical and geometric constraints at each intersection limit the ability to further increase available storage.

Table 26: Queueing Operations – 2031 Total

INTERSECTION & MOVEMENTS		STORAGE LENGTH	AM PEAK HOUR QUEUES		PM PEAK HOUR QUEUES	
			50th	95th	50th	95th
Essa Road & Mapleview Drive	EB L	80m	25m	63m	25m	46m
	WB L	80	17	34	47	**96**
	NB L	60	9	20	13	31
	NB R	30	11	26	19	**50**
	SB L	50	22	41	26	48
Mapleview Drive & Hollyholme Farm Road	EB L	30	2	8	12	23
	WB L	30	3	9	1	6
	NB L	30	1	4	13	25
	SB L	40	13	29	12	27
Mapleview Drive & Veterans Drive	EB L	150	14	24	39	73
	WB L	80	37	58	56	**103**
	NB L	80	14	28	60	**103**
	SB L	140	35	59	40	68
Essa Road & Mapleton Avenue	EB L	40	**40**	**62**	**43**	**66**
	WB L	20	4	13	14	**39**
	NB L	40	5	15	18	36
	SB L	40	3	9	8	30
Essa Road & Harvie Road	EB L	40	5	13	4	10
	WB L	100	20	37	44	75
	NB L	40	1	1	2	11
	SB L	40	4	10	10	30
Essa Road & Veterans Drive/ Ferndale Drive	EB L	50	16	37	15	34
	WB L	70	7	15	23	**79**
	NB L	60	15	29	45	**76**
	SB L	70	29	50	42	**73**
Essa Road & North Access	SB L	50	6	14	9	19

Table 27: Queueing Operations – 2041 Total

INTERSECTION & MOVEMENTS		STORAGE LENGTH	AM PEAK HOUR QUEUES		PM PEAK HOUR QUEUES	
			50th	95th	50th	95th
Essa Road & Mapleview Drive	EB L	80m	27m	64m	25m	45m
	WB L	80	19	38	73	**128**
	NB L	60	9	21	16	39
	NB R	30	13	30	26	**61**
	SB L	50	23	40	29	**55**
Mapleview Drive & Hollyholme Farm Road	EB L	30	3	9	10	20
	WB L	30	4	10	1	4
	NB L	30	1	6	14	25
	SB L	40	11	24	10	20
Mapleview Drive & Veterans Drive	EB L	150	15	28	67	137
	WB L	90	44	70	83	**141**
	NB L	80	16	29	74	**116**
	SB L	140	41	65	65	113
Essa Road & Mapleton Avenue	EB L	40	**42**	**65**	**48**	**70**
	WB L	20	6	14	15	**39**
	NB L	40	6	16	21	**41**
	SB L	40	3	11	8	32
Essa Road & Harvie Road	EB L	40	5	13	4	11
	WB L	100	20	37	46	77
	NB L	40	1	1	2	11
	SB L	40	4	10	9	27
Essa Road & Veterans Drive/ Ferndale Drive	EB L	50	20	47	25	49
	WB L	70	7	16	23	**81**
	NB L	70	17	31	46	**76**
	SB L	90	28	50	62	**115**
Essa Road & North Access	SB L	50	5	13	11	21

5.2.3 Operational Summary

Based on the results of the operational analyses conducted under future total conditions, the network is expected to provide acceptable operations through the 2041 horizon, comparable to those observed under background conditions. Adjustments to signal timing plans will be required to ensure optimal performance of the network is maintained through the 2041 horizon. No additional upgrades beyond those identified under background conditions were required to accommodate the new volumes generated by the subject development.

5.3 TURN LANE REQUIREMENTS

The need for exclusive turn lanes at each site access has been reviewed based on MTO warrants. The review is based on the following:

- MTO guidelines[10] for auxiliary turn lanes at unsignalized intersections; and
- a design speed of 80 km/h (reflective of the posted speed on each road).

5.3.1 Left Turn Lanes

At the North Access, the need for a dedicated left turn lane was reviewed under 2027 total conditions, recognizing that based on the findings of Section 3.4.4, the upgrades to Essa Road noted in Section 3.1 are warranted by 2031 thus are assumed to be in place by 2031. Completed left turn warrants are provided in Appendix I. Based on the results of the warrants, a 50-metre southbound left turn lane is recommended to serve the North Access by 2027.

Left turn lanes are already present at the MCC Access and left turns are not possible at the West Access (to be configured as a right-in/right-out), thus no further consideration is required regarding the provision of left turn lanes at these accesses.

5.3.2 Right Turn Lanes

Per MTO guidelines, right turn lanes are considered warranted where the right turning volumes at an intersection exceed 60 vph and/or impede the operation of through traffic. The 60 vph threshold is not surpassed at either the North Access or West Access at any future horizon, thus right turn lanes are not required at either access. At the MCC Access, right turning volumes exceed 60 vph at each future horizon during the PM peak hour, however, given the otherwise good operations of through traffic, a westbound right turn lane is not considered necessary to serve the access.

5.4 SIGHT LINE ASSESSMENT

The sight line assessment has considered both minimum stopping sight distance and intersection sight distance, as defined below and dictated per TAC standards:

- the minimum stopping sight distance provides sufficient distance for an approaching motorist to observe a stationary hazard in the road and bring their vehicle to a complete stop prior to the hazard; and

[10] *Geometric Design Standards for Ontario Highways.* Ontario Ministry of Transportation, undated.

- the intersection sight distance allows a vehicle to enter a main road from a side street (or site access) and attain the appropriate operating speed without significantly impacting the operating speed of an approaching vehicle.

The minimum stopping sight and intersection sight distance requirements for design speeds of 80km/h (reflective of the 60km/h posted speed limits within the study area) are summarized in Table 28. The available sight distances at each access (as determined through field measurements) are summarized in Table 29 and illustrated in Figure 26. As the MCC Access is already fully constructed, this assessment has not considered the sight lines at that intersection.

Table 28: Sight Distance Requirements

DESIGN SPEED	STOPPING SIGHT DISTANCE	INTERSECTION SIGHT DISTANCE	
		Left Turn	Right Turn
80 km/h	130 m	170 m	145 m

Table 29: Sight Distance Availability

LOCATION	DESIGN SPEED	AVAILABLE SIGHT DISTANCE TO/FROM		
		North	South	East
North Access	80 km/h	>200 m	>200 m	-
West Access	80 km/h	-	-	>200 m

As indicated, sight lines at each access exceed the noted TAC requirements, thus no improvements are required.

6 Transportation Demand Management

Transportation Demand Management (TDM) is the use of policies, infrastructure, services, and marketing and educational programs to influence or encourage a behavioural shift in people with respect to how they travel. More specifically, TDM aims to reduce single occupancy vehicle trips and ultimately, the reliance on private automobiles by promoting alternative travel options. It is noted that the city requires that a TDM program or plan be developed and implemented in support of the noted development. The transportation demand management requirements and recommendations are included below.

6.1 TDM OPPORTUNITIES

6.1.1 Public Transit

Local Transit

As noted in Section 2.2, the study area is currently served by Barrie Transit, with 3 routes (Route 7, Route 8A-NB, and Route 8B-SB) passing by the subject site. The subject site is located approximately:

- 3 km west of Park Place, a major commercial centre and transit hub connecting with many other Barrie Transit routes;
- 5.5 km southwest of Allandale Waterfront GO, a transit station operated by GO Transit which provide connections to regional GO train and GO bus services; and
- 7 km southwest of the downtown transit terminal, which provides connections to all other routes operated by Barrie Transit.

Regional Transit

Regional transit options are available within the City, provided by GO Transit. The GO Transit Route 68 is a regional bus route providing service between Allandale Waterfront GO and Aurora GO with 40 intermediate stops. The route operates at 60 minute headways 7 days per week, between the hours of approximately 4:00AM and 12:00AM (midnight). Route 68 connects with GO Transit Route 65, another regional bus route which provides service to Union Station in downtown Toronto, and with the Barrie Line. Connections to the remainder of the GO Transit network are available at Union Station.

GO train service on the Barrie Line operates between Allandale Waterfront GO and Union Station, with 9 intermediate stops. Weekday service is provided one-way at 30 to 60 minute headways during peak commuter hours (6 southbound trains between 5:30AM and 9:30AM and 4

northbound trains between 3:00PM and 6:00PM), with limited service outside of these hours. There are 8 total trains provided per direction every weekday and 6 trains provided per direction on weekends.

6.1.2 Active Transportation

As noted in Section 2.3, the subject site is reasonably well served by the existing sidewalk/multi-use path system present along Mapleview Drive and Essa Road (illustrated in Figure 4). One major deficiency was identified – there are no active transportation facilities are present along Essa Road between Mapleview Drive and Coughlin Road. As detailed in Section 3.1, such facilities will be added in conjunction with the reconstruction of Essa Road along the noted section, which is recommended to be complete by 2031. As detailed in Section 3.3, further upgrades to existing active transportation facilities are planned along Essa Road, Mapleview Drive, and Hollyholme Farm Road, to be implemented post 2031.

With respect to the existing and proposed active transportation infrastructure, the site is considered to be well connected to the local transportation network.

6.2 TDM PROGRAM

A TDM program has been developed which provides a framework for implementation of specific TDM measures. The details of such are provided below.

6.2.1 TDM Coordinator

The TDM Coordinator will be required within the proposed development to implement and manage the TDM program on an ongoing basis. The responsibilities of the TDM Coordinator include the following:

- champion of the TDM program;
- liaise with the City to tailor and deliver a TDM program that meets the needs of the site;
- liaise with local transit providers in order to gather and disseminate transit service information (i.e. fare structures, schedules and maps) to the future residents and employees to ensure that commuters are educated regarding transit options; and
- act as the TDM point of contact for residents.

The TDM Coordinator is the promoter, educator, and facilitator for the TDM program. It is expected that the developer will assume the responsibility of the TDM Coordinator or transfer such responsibilities to the property manager.

6.2.2 Marketing & Education

A site-specific TDM marketing and education package will be prepared and distributed to all new residents and employees of the development. The TDM package should include the following information:

- introduction to TDM objectives, goals and benefits;
- a travel survey;
- maps of cycling routes/sidewalk network in the City of Barrie;
- bicycle safety information;
- school travel planning initiatives;
- transit schedules for local services (i.e. Barrie Transit, GO Transit); and
- carpool/rideshare information and registration forms.

The marketing and education package will be organized in conjunction with City staff to ensure consistency with the TDM programs being delivered to other developments of similar size within the City.

6.2.3 Transit Initiatives

Encouraging the use of the available transit services serving the site is crucial to the overall success of the TDM program. In order to increase the likelihood that a commuter will try transit, it is important to remove or lessen the barriers or hurdles that currently prevent commuters from making the switch. The TDM plan will include the distribution of prepaid Barrie Transit ride cards for the new residents of the site to use on local transit services. The intent of the prepaid card is to provide a financial incentive to encourage commuters to try public transit, with the ultimate goal of a more permanent shift to transit use by commuters. The value of the prepaid transit cards will be determined in coordination with City staff.

Based on results of the travel survey, additional consideration should be given to an initial investment in prepaid PRESTO cards for residents planning to commute using GO Transit to the southern employment regions (i.e. Vaughan, Markham, Toronto, etc.).

In addition to the noted transit incentives, real-time transit display boards may be provided in the lobby area as a means of providing continuous transit information to residents and visitors.

6.2.4 Communication Strategy

It is the responsibility of the developer (or the TDM coordinator appointed by the developer) to liaise with the City and transit providers to ensure the efficient and effective delivery of the TDM

information packages and prepaid transit cards to the residents of the development. Given the size of the development, extensive information sessions should be held where TDM details can be presented and resident questions answered.

6.2.5 Outreach Programs

The TDM coordinator will remain a point of contact with the City to support future outreach programs, whether site-specific or as part of wider TDM initiatives spearheaded by the City. It is understood that the initiation and cost of any future outreach programs is not the responsibility of the developer.

6.2.6 Other Support Measures

In addition to the above, other measures to be implemented in support of the TDM plan include:

- provision of long and short-term bicycle parking; and
- designated car-share spaces (predicated on attracting a car share provider to the area).

6.2.7 TDM Monitoring Program

Program monitoring is an essential component for all TDM plans. A TDM program must be periodically measured and evaluated with respect to the overall effectiveness of the program and its individual components. The intent of program monitoring is to ensure that the TDM program remains relevant to the needs of the residents and commuters and properly reflects any changes to the available transportation services and infrastructure in the area. In this respect, a TDM program must be dynamic. The monitoring of the program informs the process of change.

The most common method of monitoring a TDM program is through administration of a travel or commuter survey to residents of the site. A commuter survey is an electronic or paper-based tool used for gathering important information regarding travel habits and attitudes of the residents. As previously noted, an initial survey must be conducted in order to establish a benchmark with respect to existing travel behaviour. Going forward, the survey should be administered annually or biannually, and results compared to previous survey results in order to identify any successes or short comings of the TDM program and/or wider TDM initiatives spearheaded by the City. The travel survey should be provided by, or developed in conjunction with, City staff. The developer/TDM coordinator will support the ongoing monitoring efforts of the City.

6.3 TDM SUMMARY

The TDM plan for the proposed development includes a marketing and education package that is distributed to new residents and employees of the development on an ongoing basis. The

package should include a travel survey, preloaded transit cards, cycling maps, transit maps and schedules, safety tips, and other information regarding programs supporting alternative modes of transportation. The TDM Coordinator for the site will support ongoing outreach and monitoring programs initiated by the City.

7 Summary

This study has addressed the transportation impacts associated with the proposed mixed-use development to be located at the northeast corner of the intersection of Essa Road and Mapleview Drive in the City of Barrie.

7.1 PROPOSED DEVELOPMENT

The proposed development consists of a total of 1,217 residential units (consisting of a mix of townhouses and residential apartment units), 2,661 m^2 of ground floor retail space, a 653 m^2 public library, and 162 m^2 daycare. Upon completion in 2031, the site is expected to generate 497 new trips during the weekday AM peak hour and 658 new trips during the weekday PM peak hour.

7.2 TRANSPORTATION IMPACTS

To assess the impacts of the proposed development, the operations of the key intersections within the study area were analyzed under existing conditions (2022) and future (2027, 2031, 2036, and 2041) horizon periods. Improvements to the study area road network as identified in the City of Barrie's *Transportation Master Plan* have been considered in the assessment at the 2036 horizon as dictated by operational needs.

7.2.1 Intersection Operations

The results of the operational analyses indicate that the network currently provides good overall operations (LOS D or better) under existing conditions in their current configuration. Some movements were observed to operate at LOS F, however this can be addressed through modifications to the existing signal timing plans.

At each future horizon under background conditions, the network is expected to continue to provide good overall operations (LOS D or better). Some individual movements are expected to operate at LOS E and at/over capacity ($v/c \geq 1.00$) by the 2036 horizon, though no additional improvements (beyond those noted for Essa Road) are required. Under future total conditions the network is expected to perform similarly as was observed under background conditions, with each intersection operating at LOS D or better overall. Individual movements are expected to continue to operate at LOS E or better, with some movements continuing to operate at/over capacity. No improvements are recommended to accommodate the future total conditions.

7.2.2 Queue Operations

Queue operations at each key intersection were reviewed under existing conditions and at the 2031 and 2041 horizons to ensure that turn lane configurations are sufficient to accommodate turning queues without interfering with the through movements.

Under existing conditions, storage lengths were found to be sufficient. Under 2031 and 2041 background conditions, storage lengths were found to be sufficient to accommodate the average AM and PM peak hour queues, and 95th percentile queues during the AM peak hour. During the PM peak hour, many 95th percentile queues were found to exceed available storage. Increases to available storage were recommended where feasible based on practical and geometric constraints at each intersection. Under 2031 and 2041 total conditions, queues were not found to vary significantly from those observed under background conditions, thus no further improvements were considered necessary.

7.3 TURN LANE REQUIREMENTS

The need for exclusive left and right turn lanes at the new site access points were reviewed in context of MTO warrant criteria. Based on this review, a 50 metre southbound left turn lane is warranted by the 2027 horizon on Essa Road to serve the North Access (should the reconstruction and widening of Essa Road be accelerated, the planned centre turn lane will address this requirement). No additional turn lanes are required to serve the site.

7.4 SIGHT LINE ASSESSMENT

Sight lines at each of the new proposed site access points were reviewed in context of TAC requirements for minimum stopping and intersection sight distances. Based on the review, the sight lines at each new access were found to be acceptable.

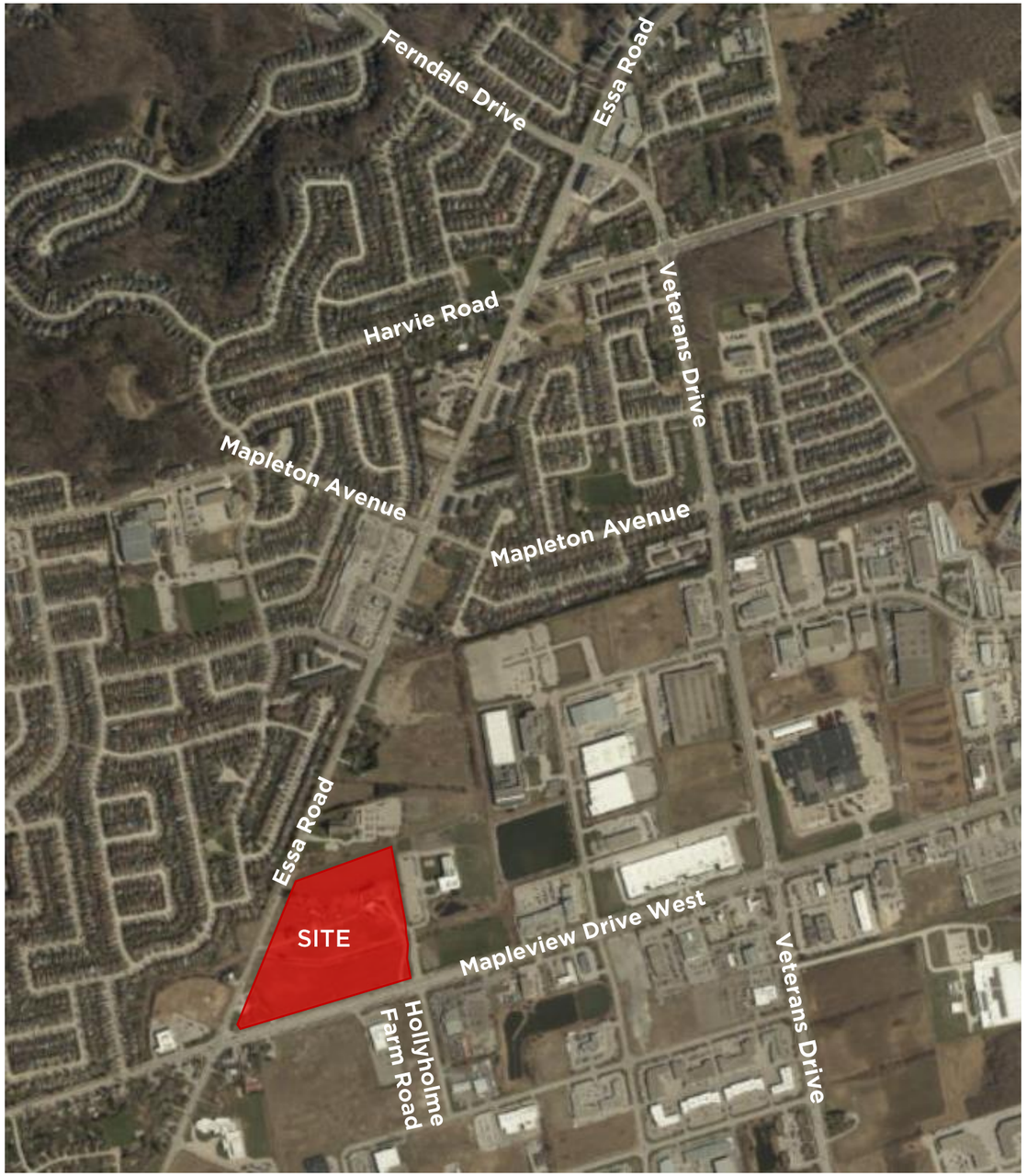
7.5 TRANSPORTATION DEMAND MANAGEMENT

Potential Transportation Demand Management (TDM) opportunities were identified and a framework for implementation of a TDM program was developed for the subject site.

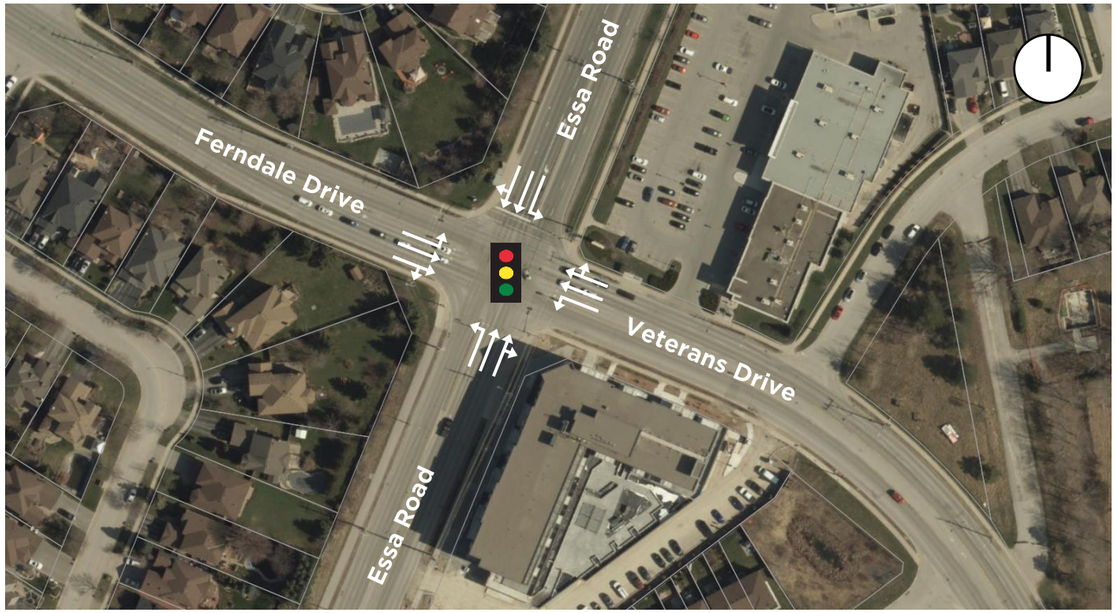
Source: opengis.simcoe.ca

MAPLEVIEW & ESSA DEVELOPMENT

Figure 1: Site Location



Road Network



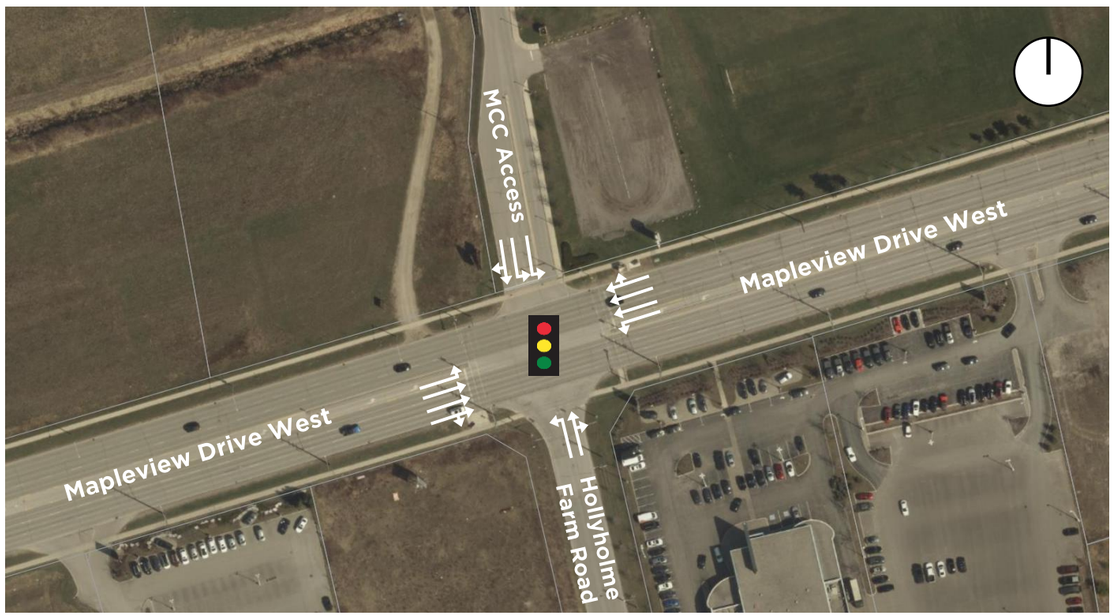
Intersection of Essa Road with Ferndale Drive and Veterans Drive

Intersection of Essa Road with Harvie Road

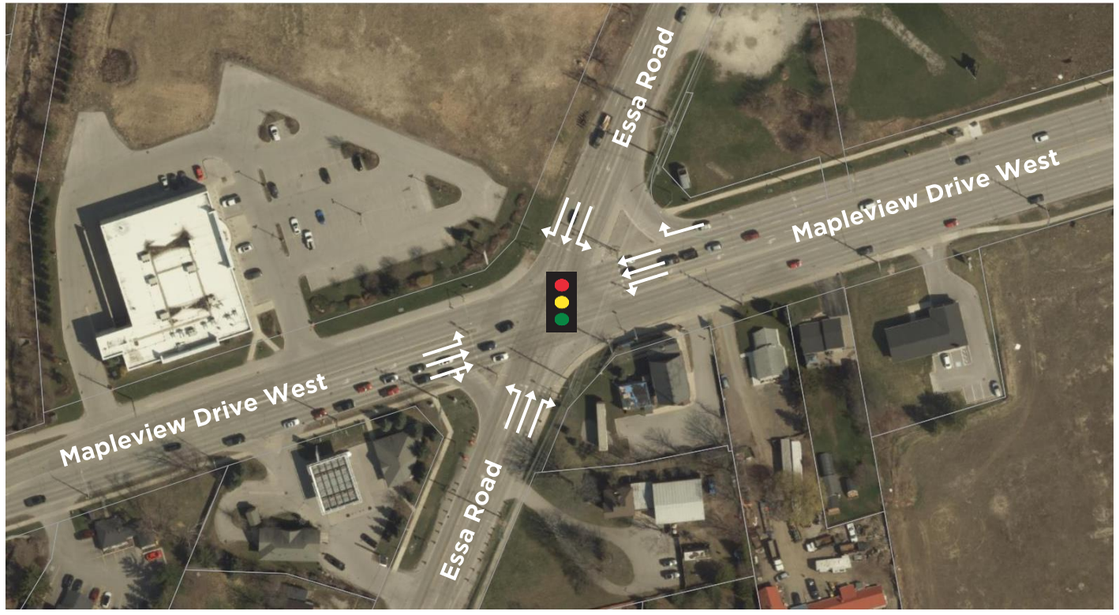
MAPLEVIEW & ESSA DEVELOPMENT

Figure 2A: Road Network

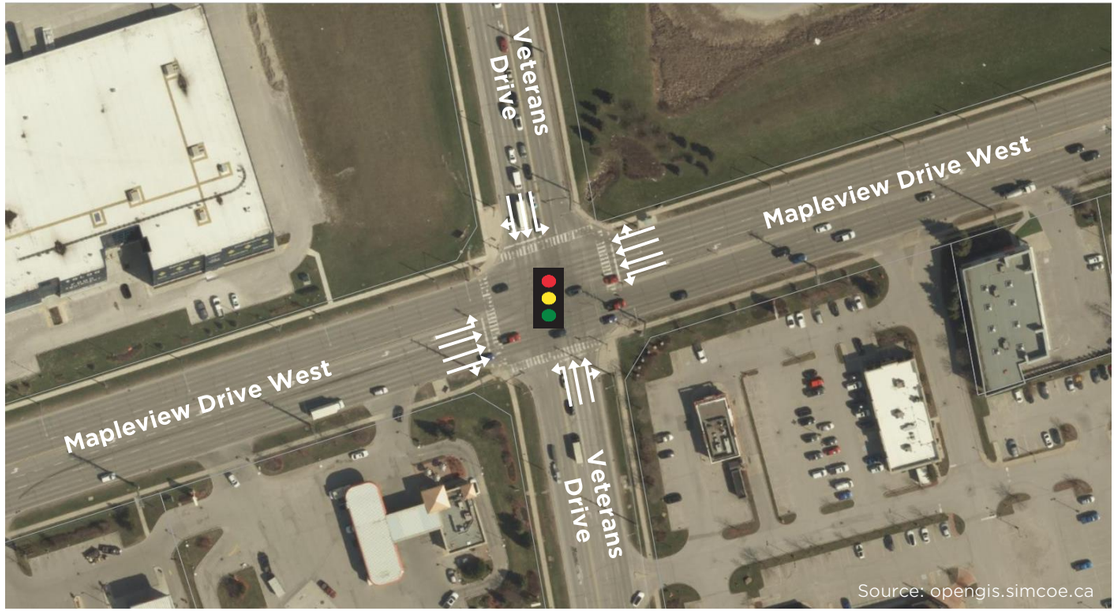
Intersection of Essa Road with Mapleton Avenue



Intersection of Mapleview Drive with Hollyholme Farm Road and Mapleview Community Church access



Intersection of Essa Road with Mapleview Drive



Intersection of Mapleview Drive with Veterans Drive

MAPLEVIEW & ESSA DEVELOPMENT

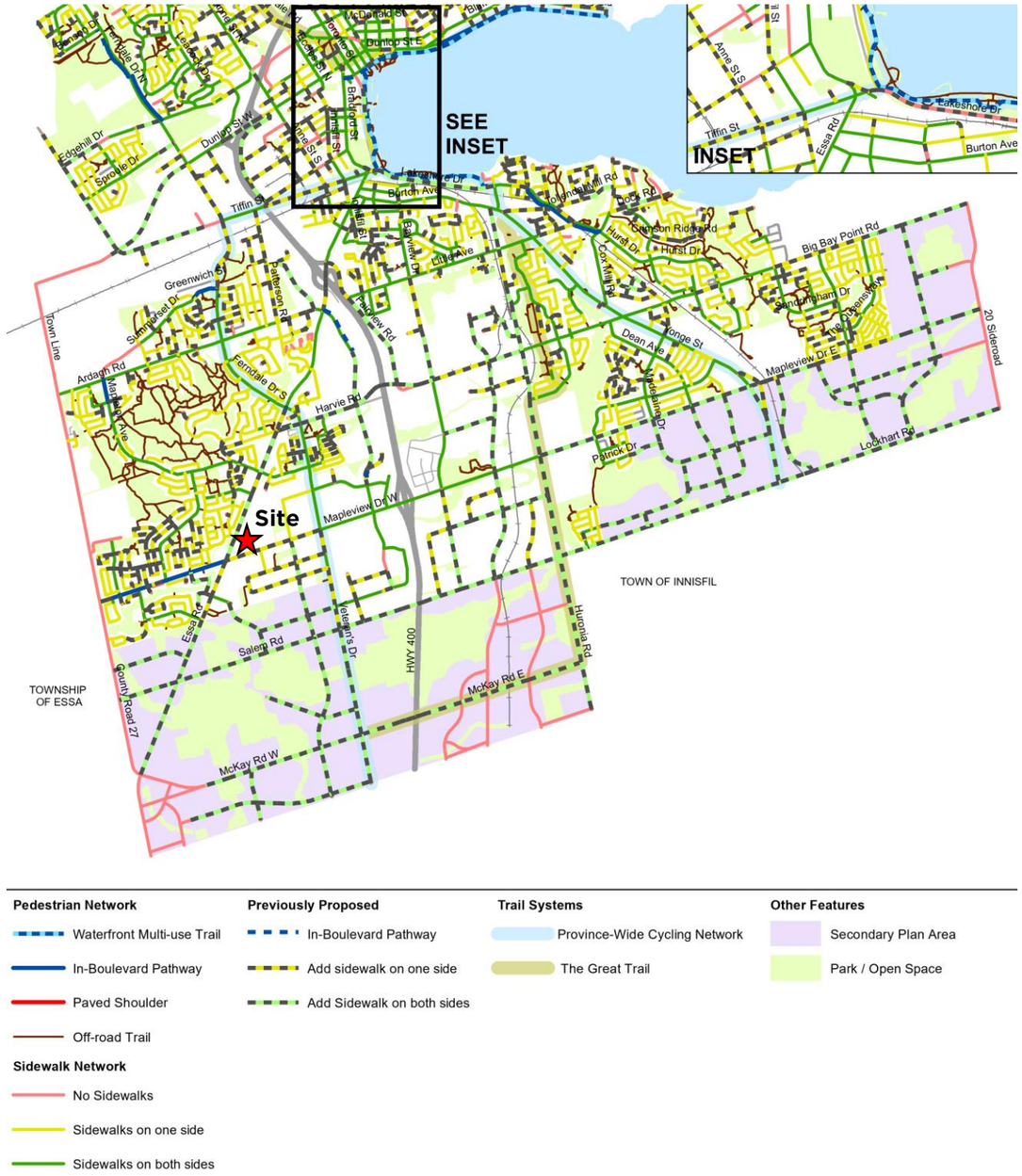
Figure 2B: Road Network

Barrie Transit System Map – July 2022

Route pathing and stops near subject site

MAPLEVIEW & ESSA DEVELOPMENT

Figure 3: Barrie Transit Network - Existing



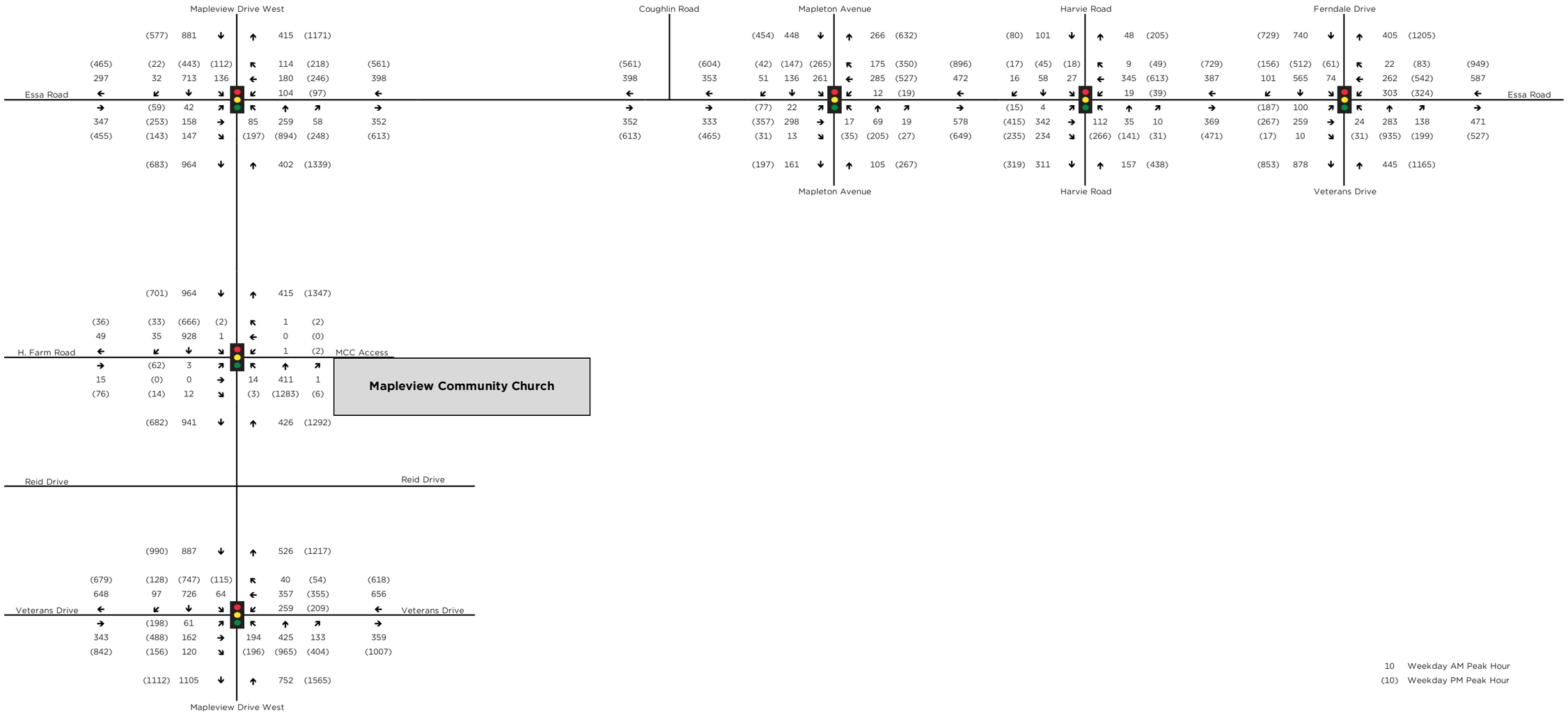
Source: City of Barrie TMP

Existing sidewalk & trail network

Existing active transportation facilities within 500 metre radius of site

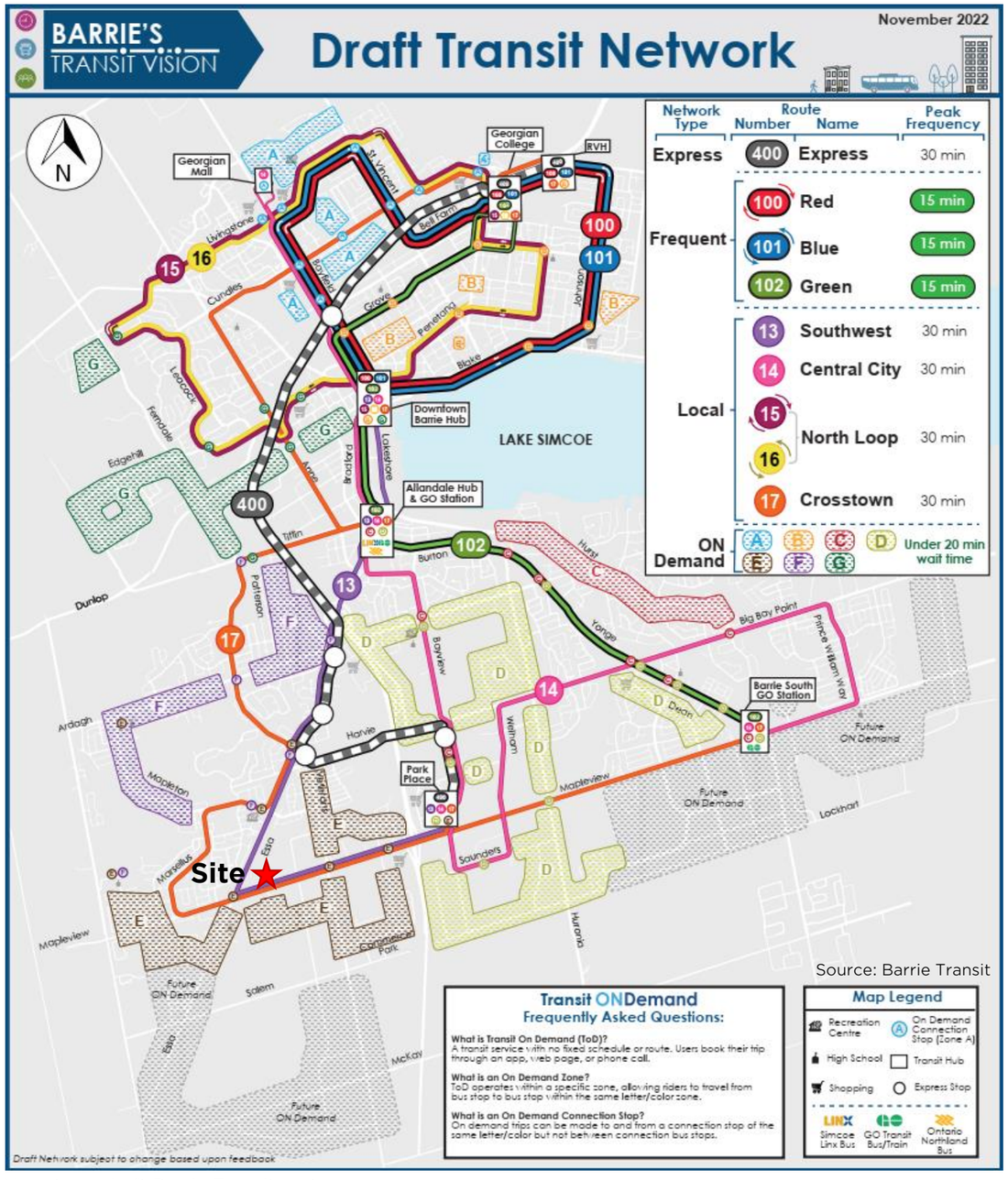
MAPLEVIEW & ESSA DEVELOPMENT

Figure 4: Active Transportation Network



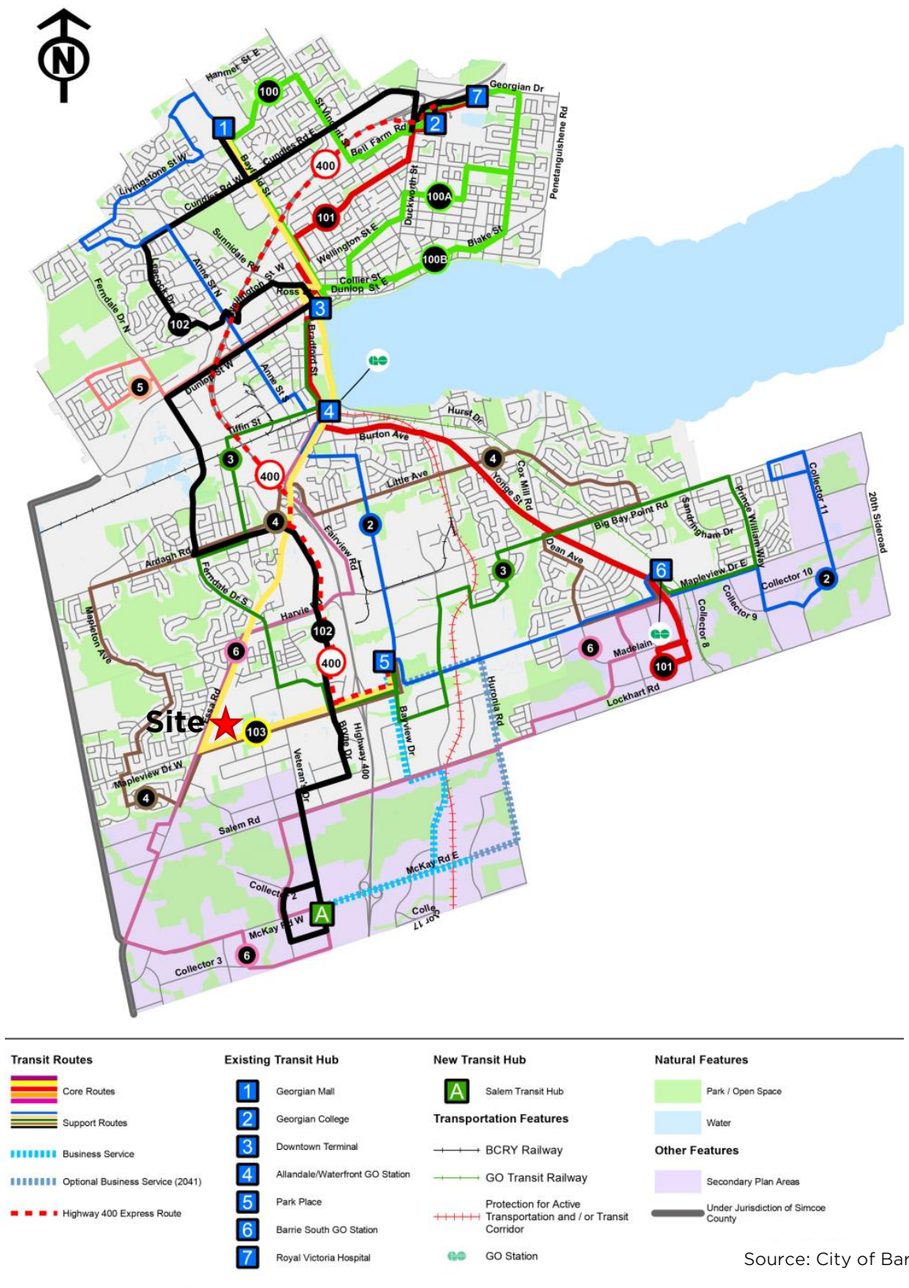
MAPLEVIEW & ESSA DEVELOPMENT

Figure 5: Traffic Volumes – 2022



Source: Barrie Transit

Near-term draft Barrie Transit system map

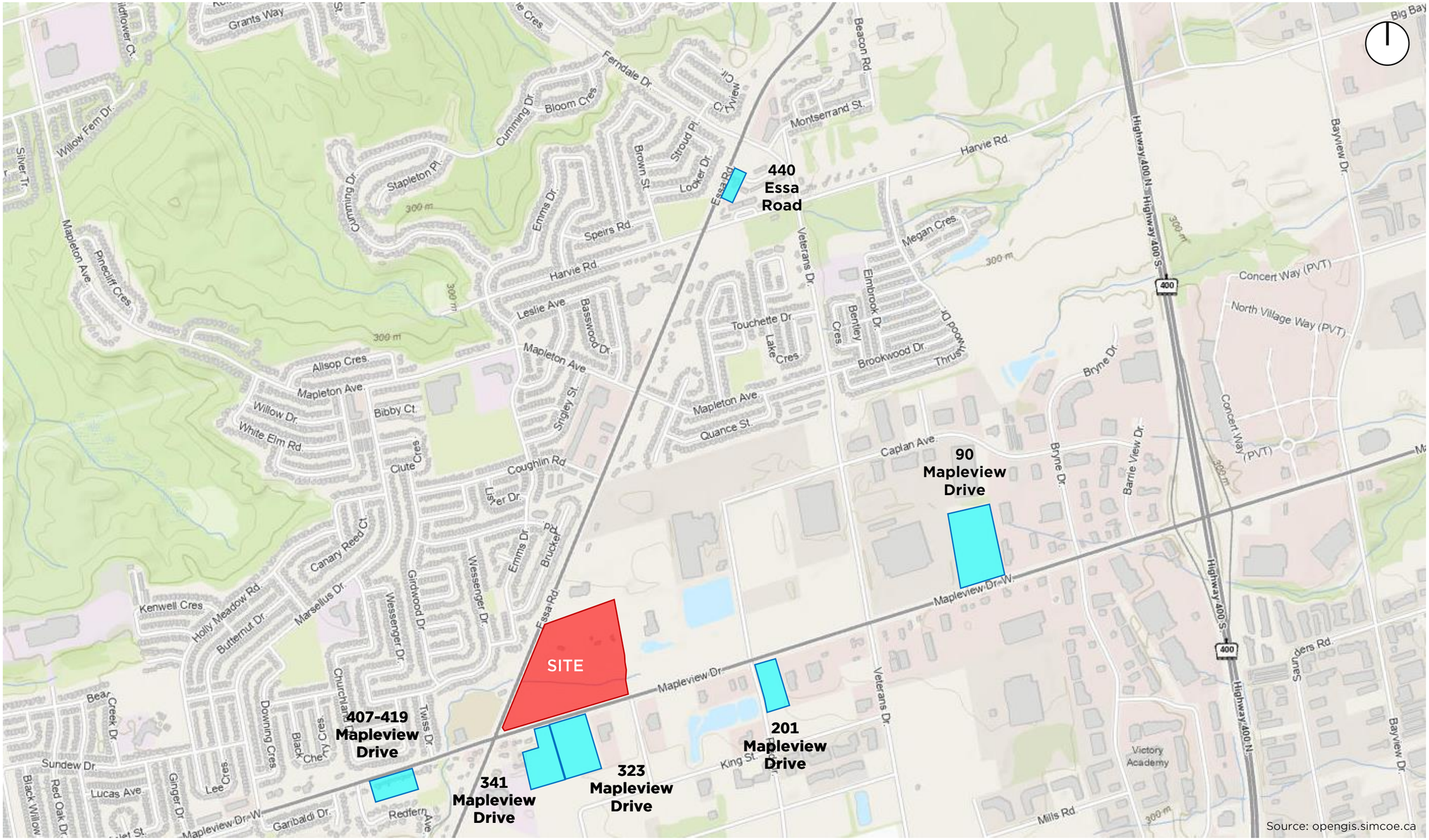


Source: City of Barrie TMP

Long-term conceptual Barrie Transit system map

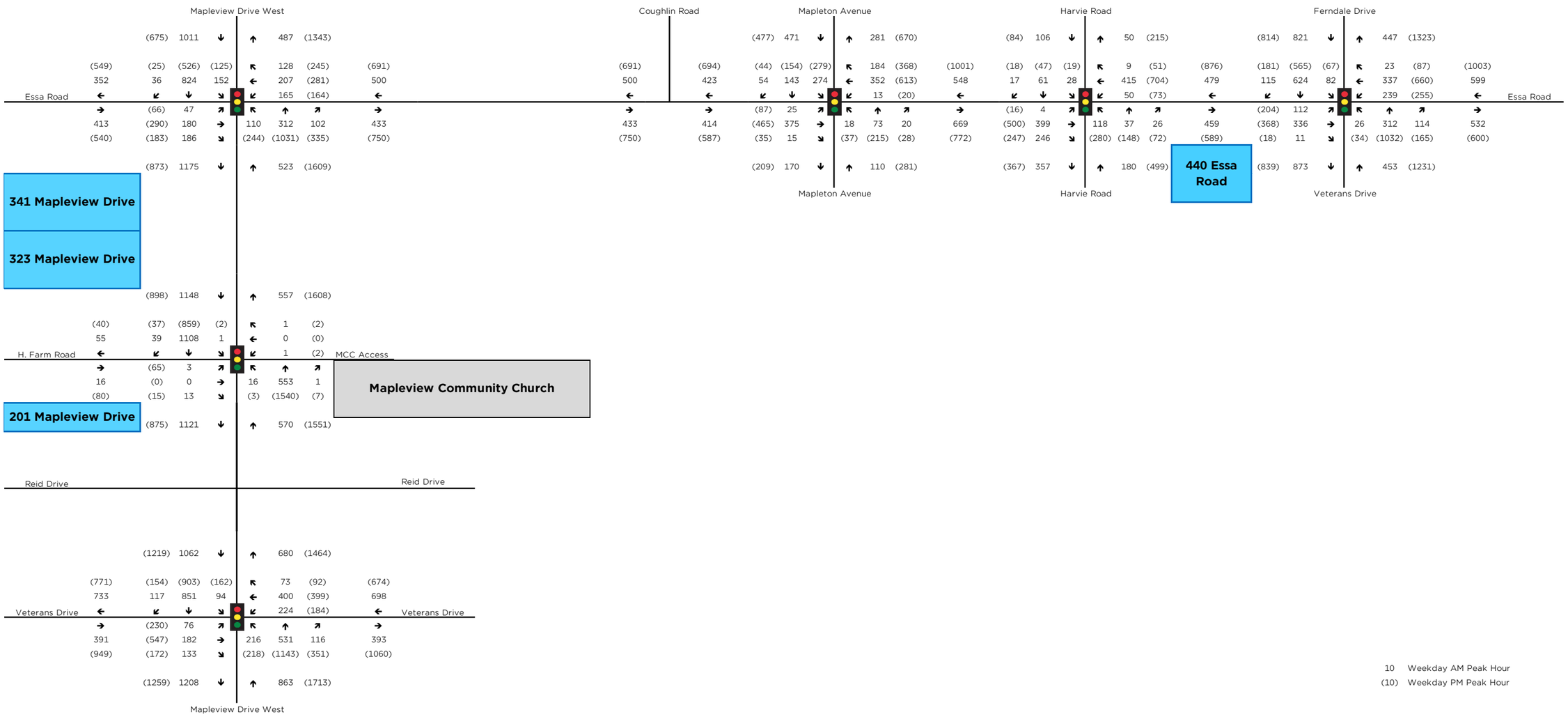
MAPLEVIEW & ESSA DEVELOPMENT

Figure 6: Barrie Transit Network - Future



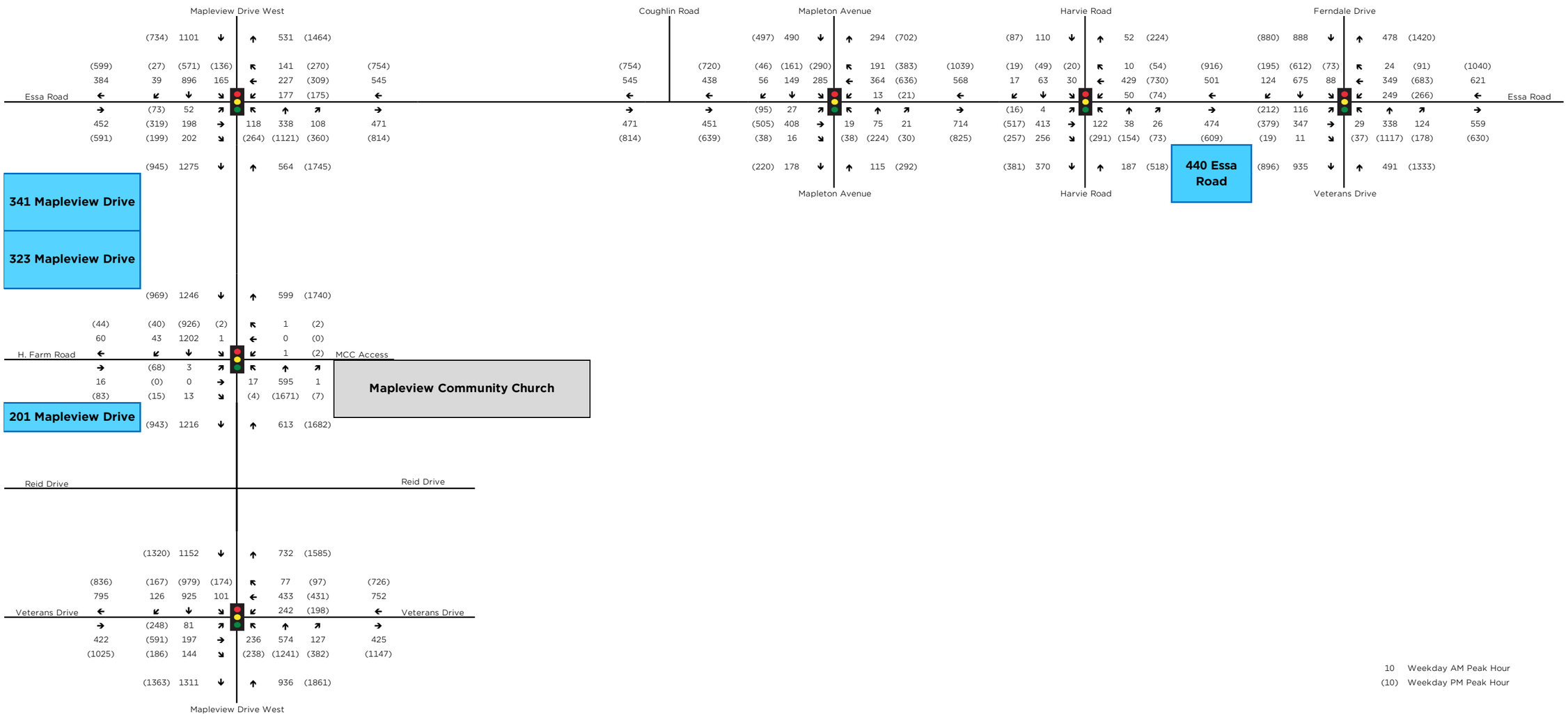
MAPLEVIEW & ESSA DEVELOPMENT

Figure 7: Background Development Locations



MAPLEVIEW & ESSA DEVELOPMENT

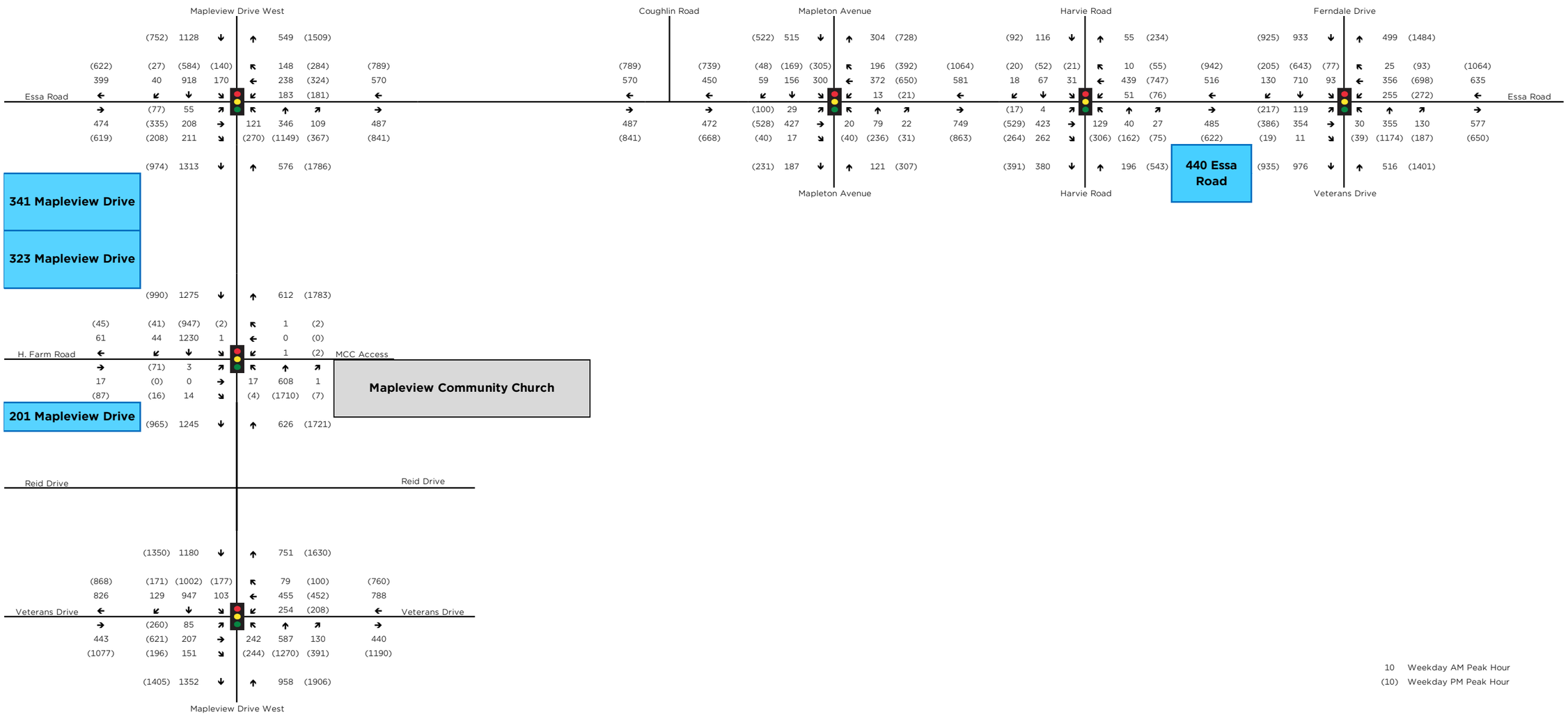
Figure 8: Traffic Volumes – 2027 Background



10 Weekday AM Peak Hour
(10) Weekday PM Peak Hour

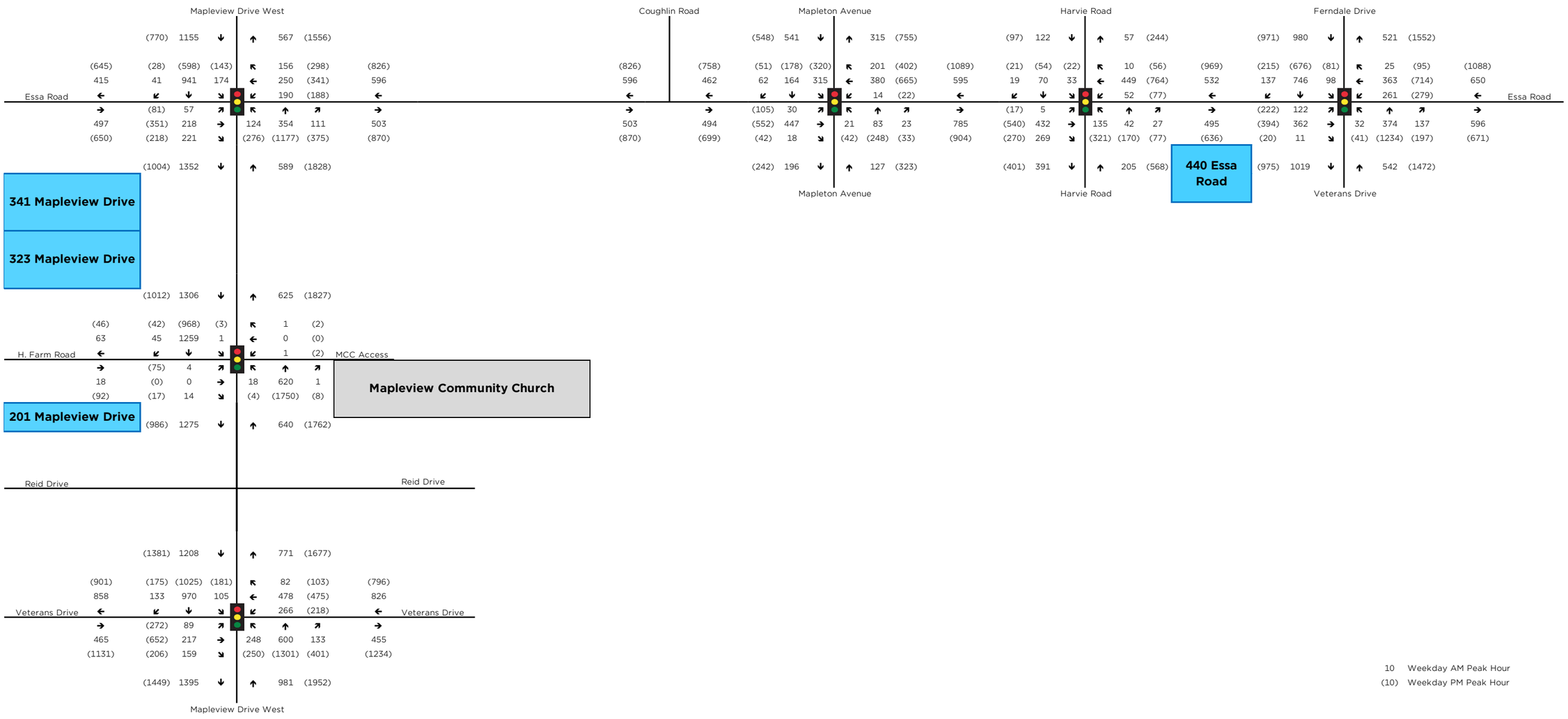
MAPLEVIEW & ESSA DEVELOPMENT

Figure 9: Traffic Volumes – 2031 Background



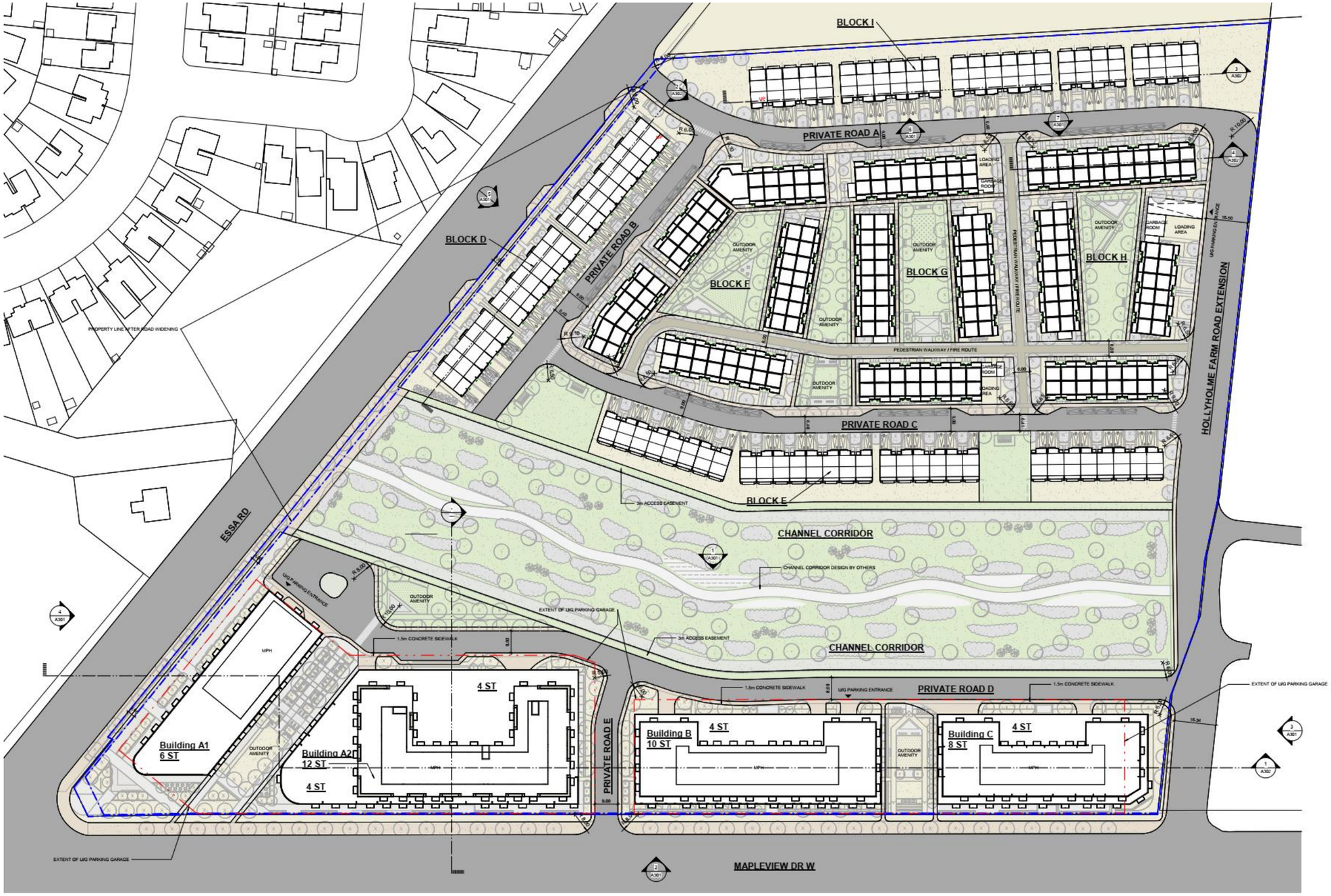
MAPLEVIEW & ESSA DEVELOPMENT

Figure 10: Traffic Volumes – 2036 Background



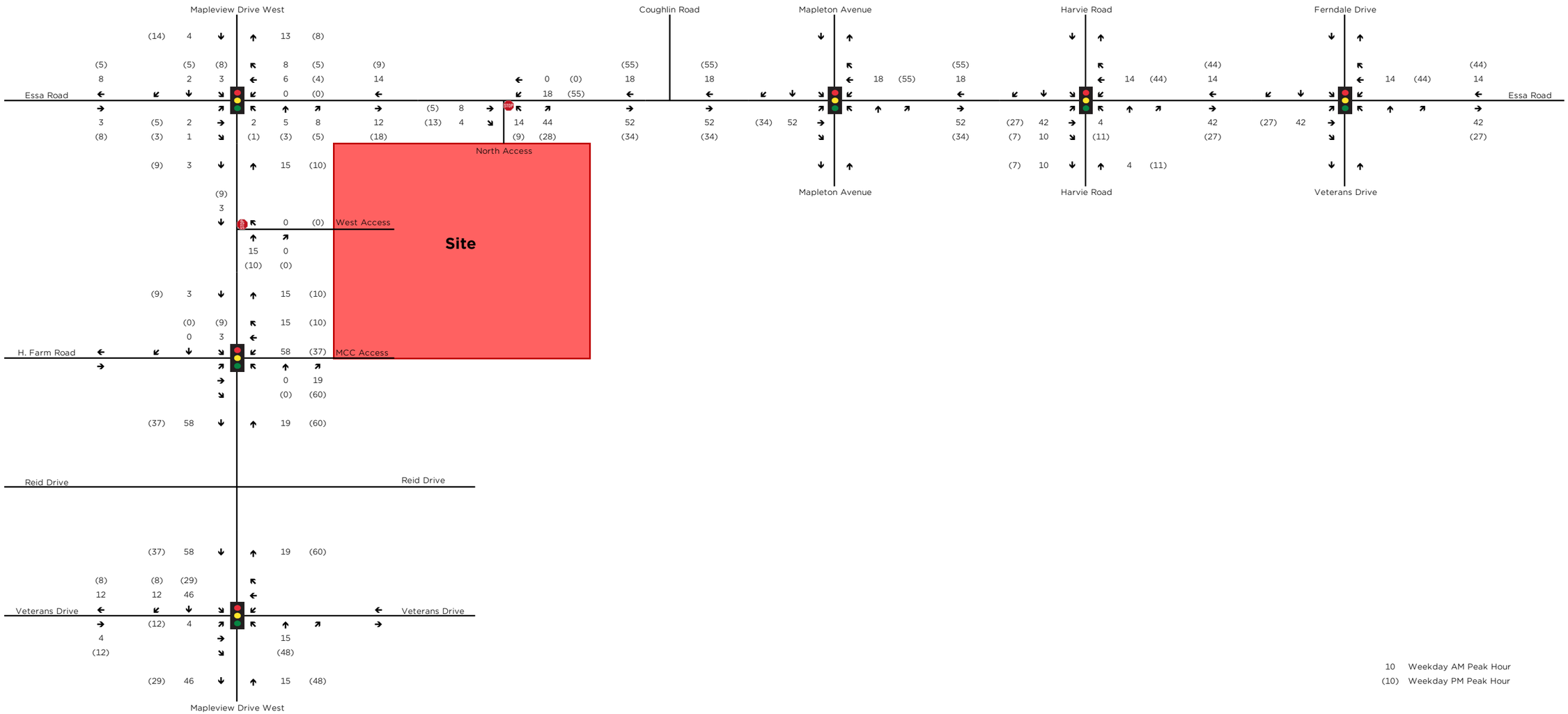
MAPLEVIEW & ESSA DEVELOPMENT

Figure 11: Traffic Volumes – 2041 Background



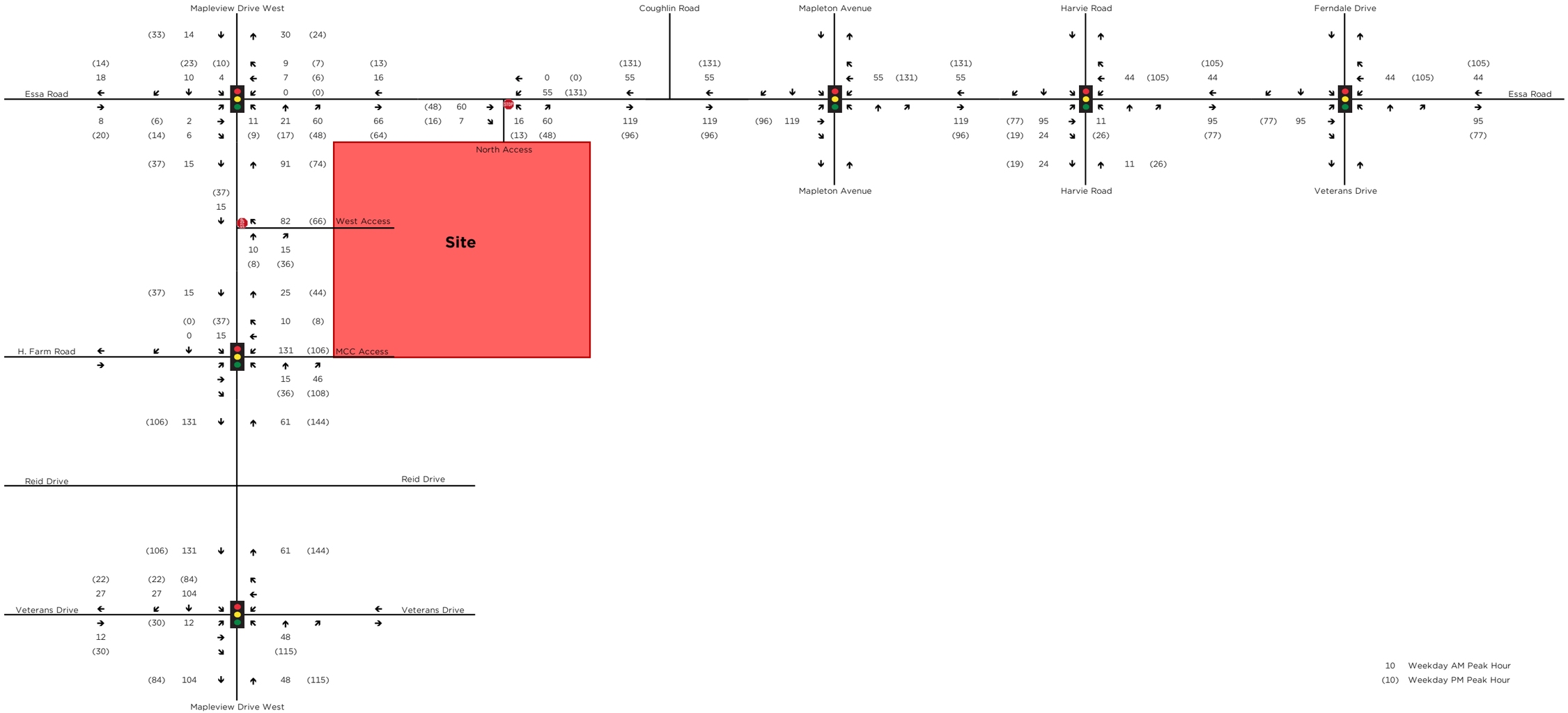
MAPLEVIEW & ESSA DEVELOPMENT

Figure 12: Site Plan



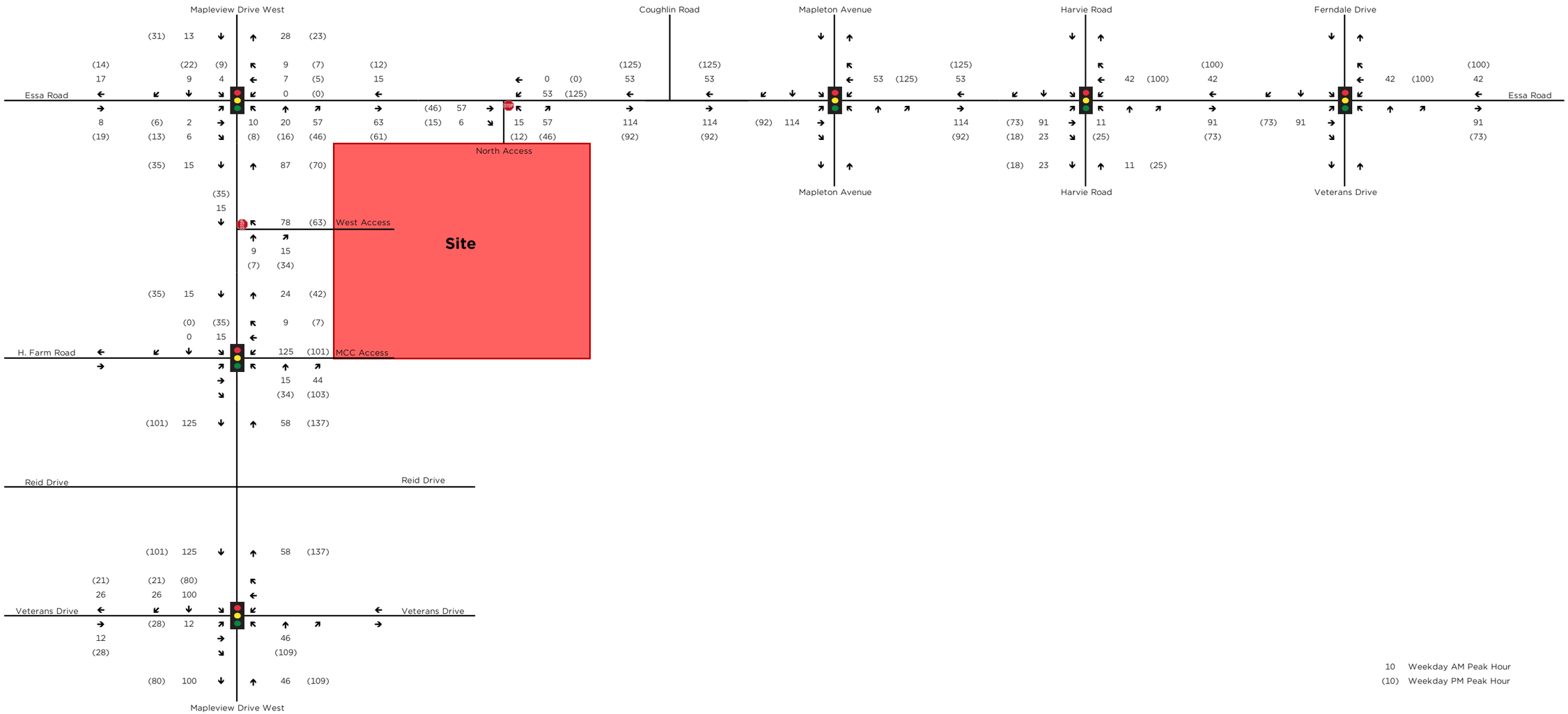
MAPLEVIEW & ESSA DEVELOPMENT

Figure 13: Site-Generated Traffic – New Trips (2027)



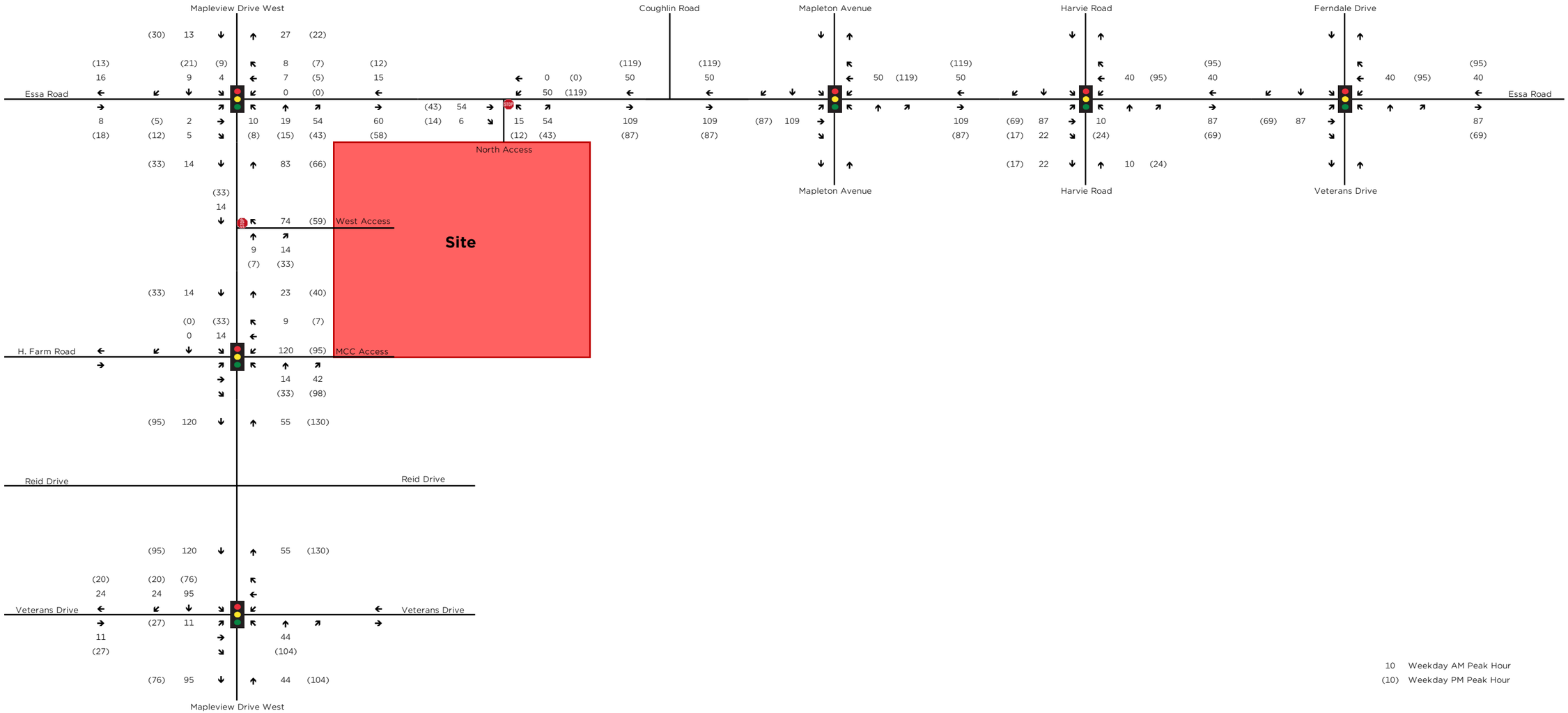
MAPLEVIEW & ESSA DEVELOPMENT

Figure 14: Site-Generated Traffic – New Trips (2031)



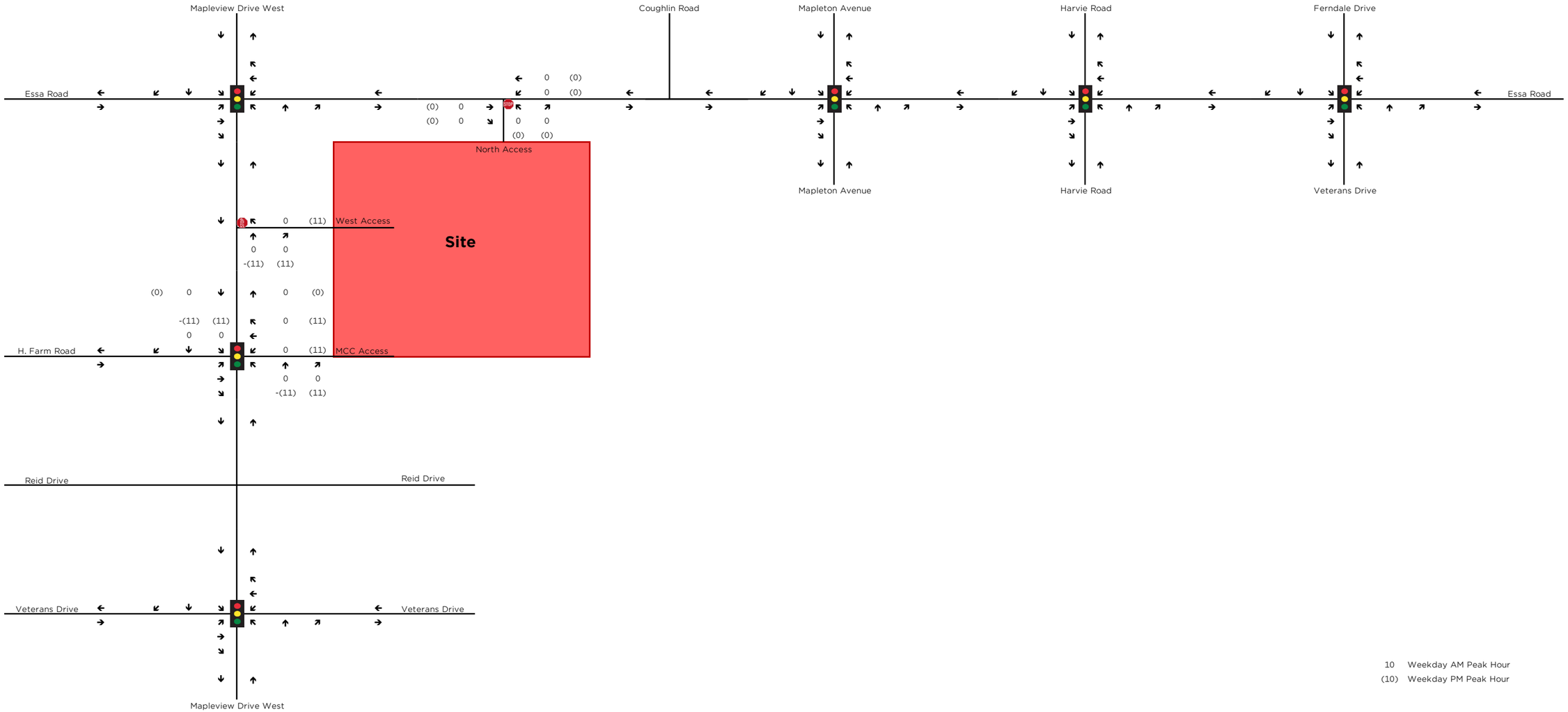
MAPLEVIEW & ESSA DEVELOPMENT

Figure 15: Site-Generated Traffic – New Trips (2036)



MAPLEVIEW & ESSA DEVELOPMENT

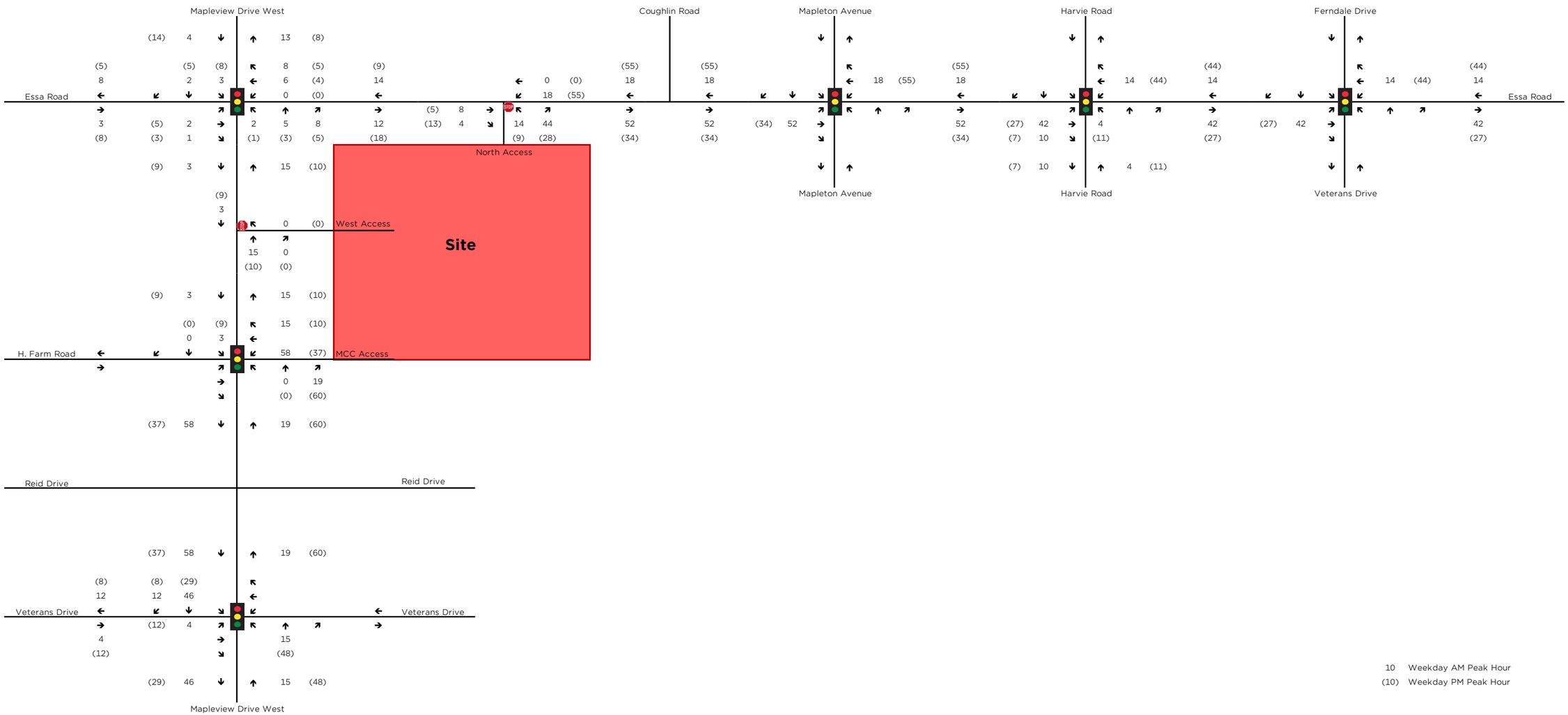
Figure 16: Site-Generated Traffic – New Trips (2041)



10 Weekday AM Peak Hour
(10) Weekday PM Peak Hour

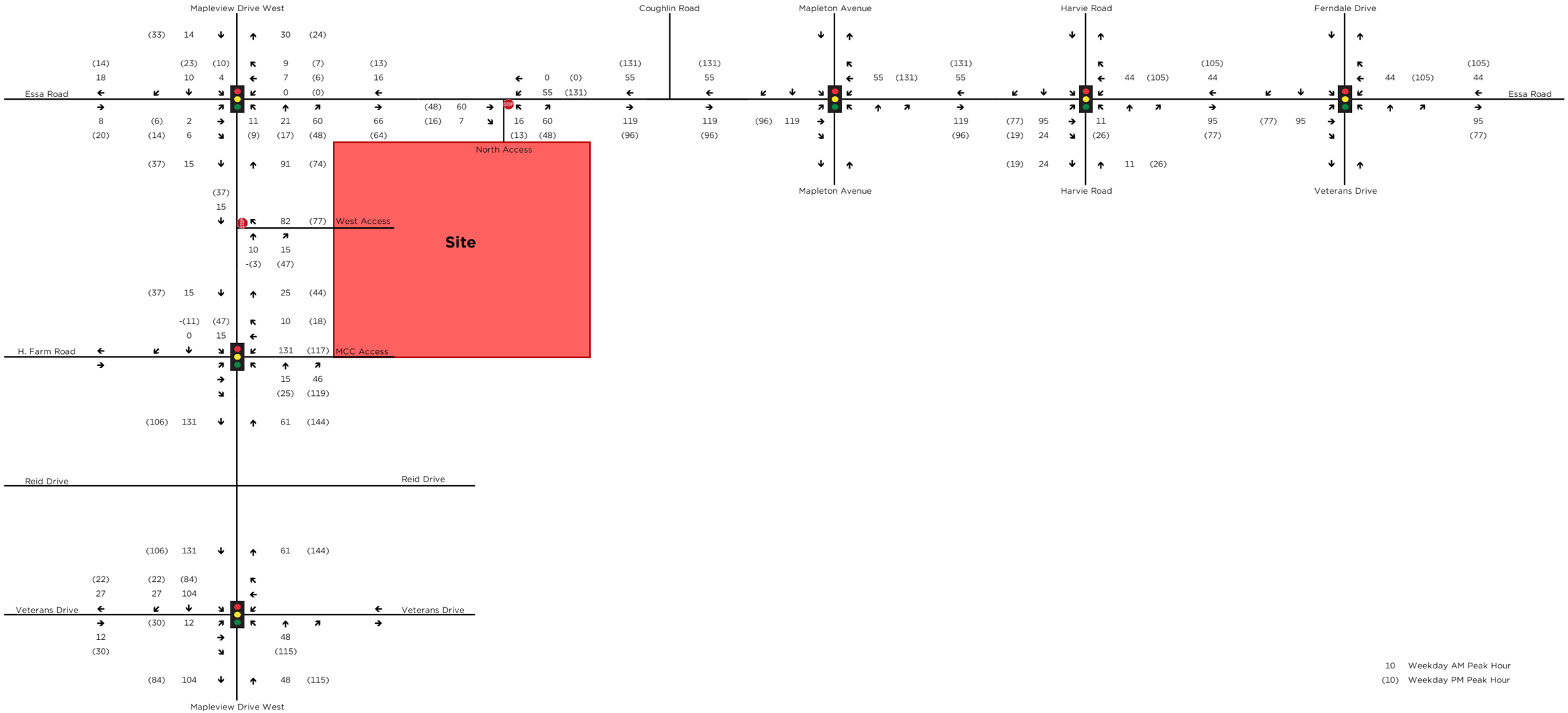
MAPLEVIEW & ESSA DEVELOPMENT

Figure 17: Site-Generated Traffic – Pass-by Trips



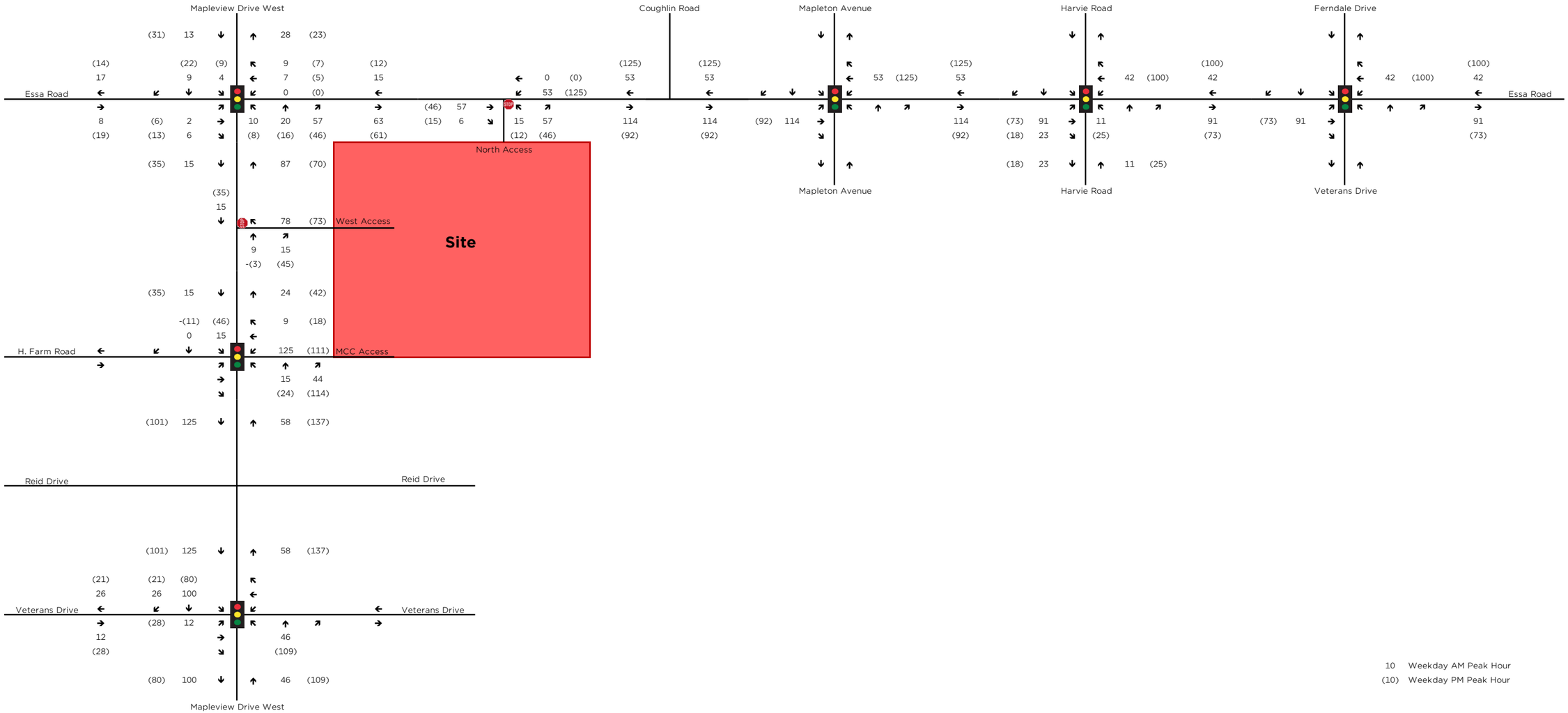
MAPLEVIEW & ESSA DEVELOPMENT

Figure 18: Site-Generated Traffic – Total Trips (2027)



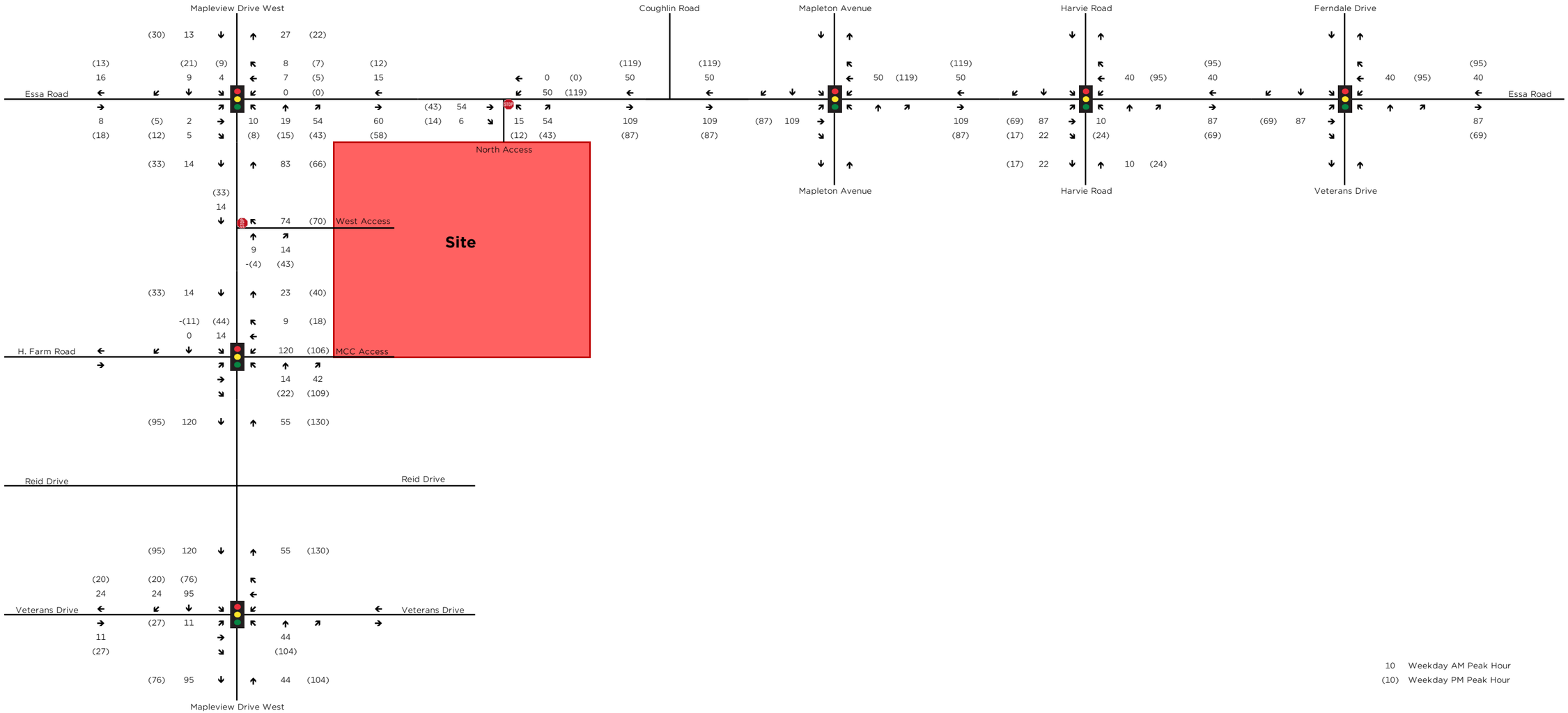
MAPLEVIEW & ESSA DEVELOPMENT

Figure 19: Site-Generated Traffic – Total Trips (2031)



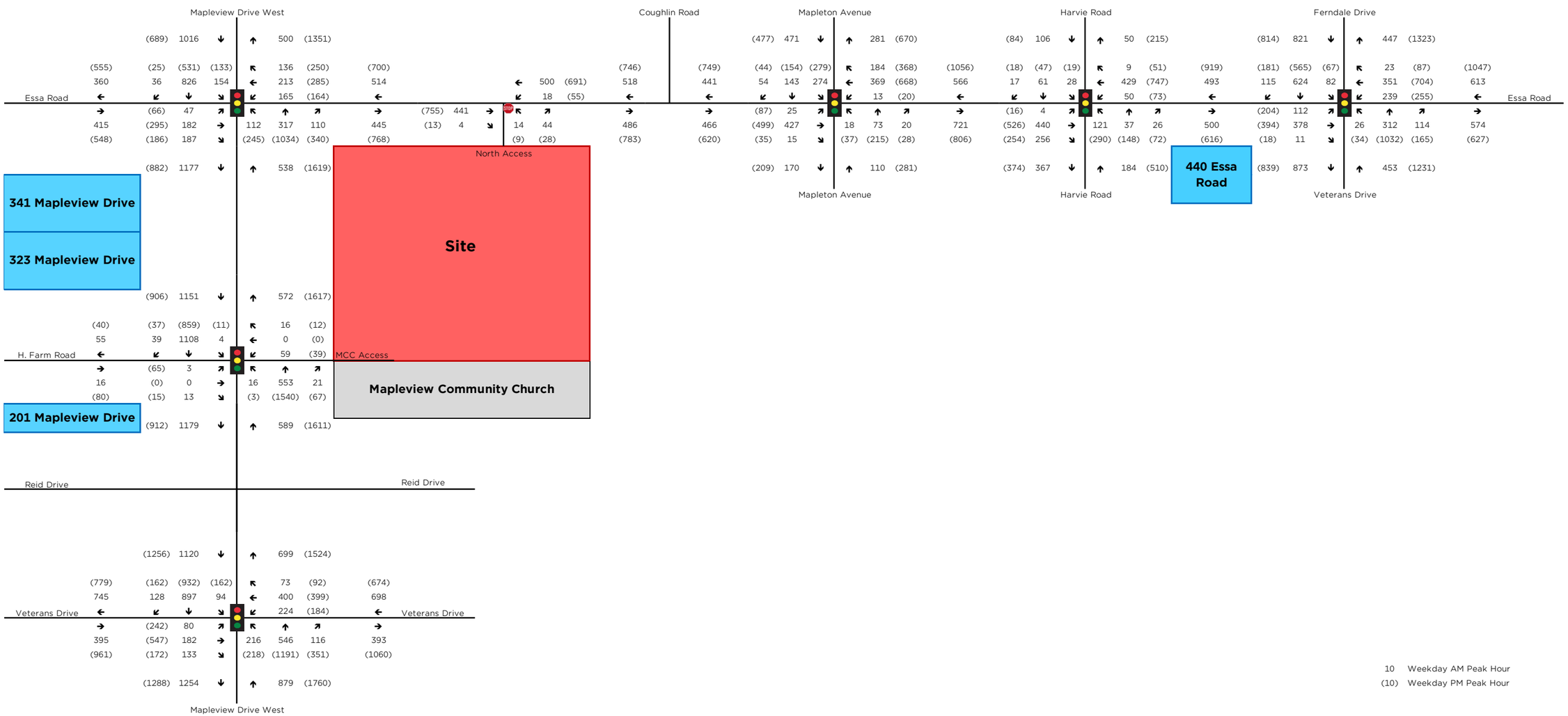
MAPLEVIEW & ESSA DEVELOPMENT

Figure 20: Site-Generated Traffic – Total Trips (2036)



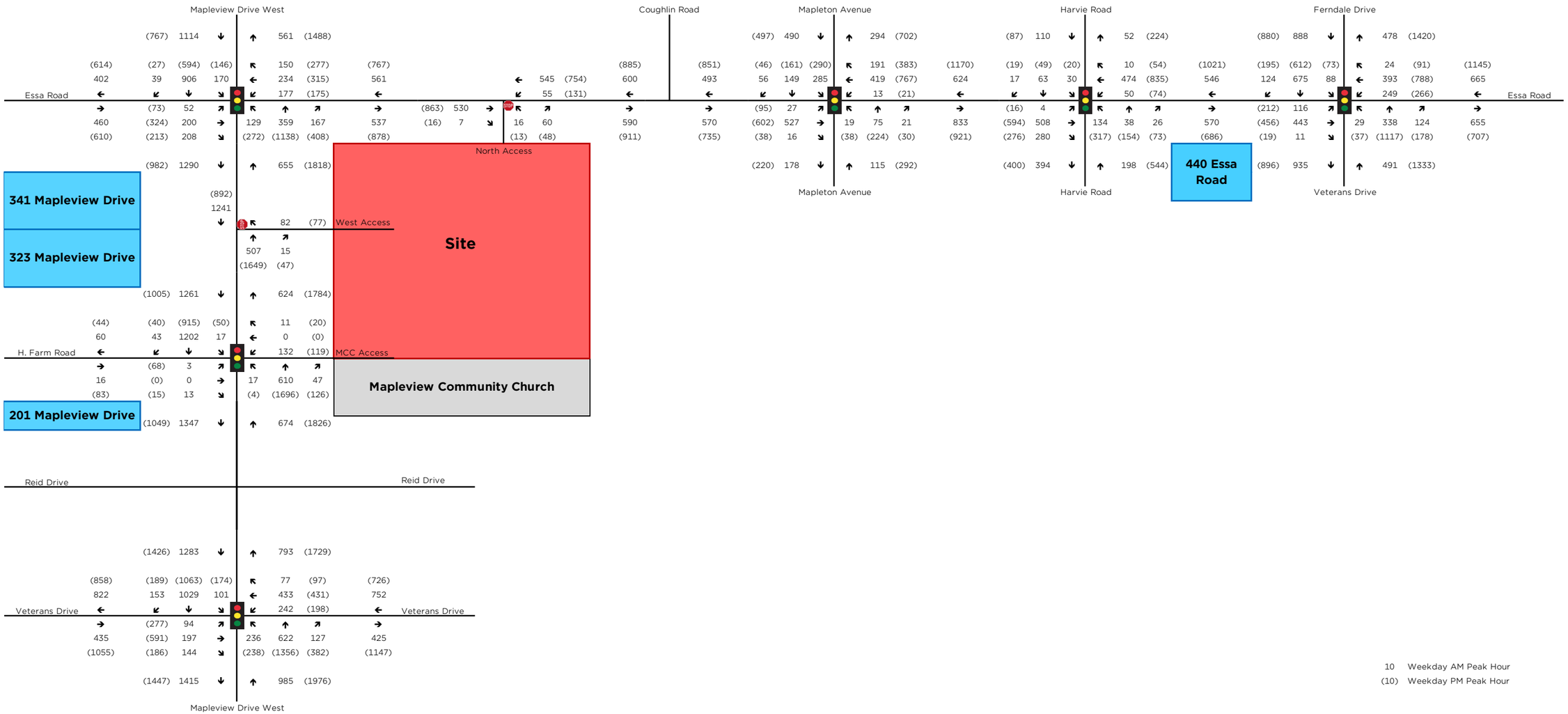
MAPLEVIEW & ESSA DEVELOPMENT

Figure 21: Site-Generated Traffic – Total Trips (2041)



MAPLEVIEW & ESSA DEVELOPMENT

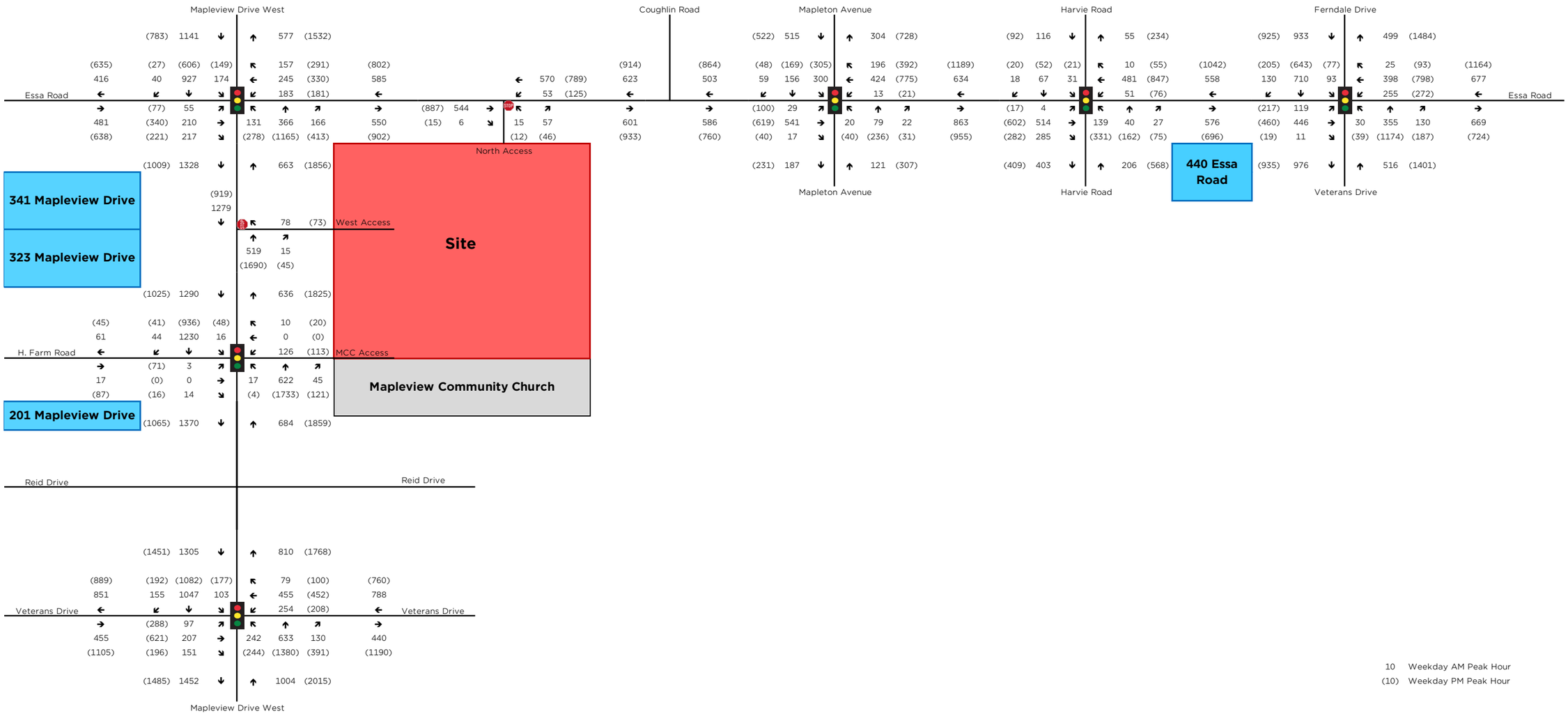
Figure 22: Traffic Volumes – 2027 Total



10 Weekday AM Peak Hour
(10) Weekday PM Peak Hour

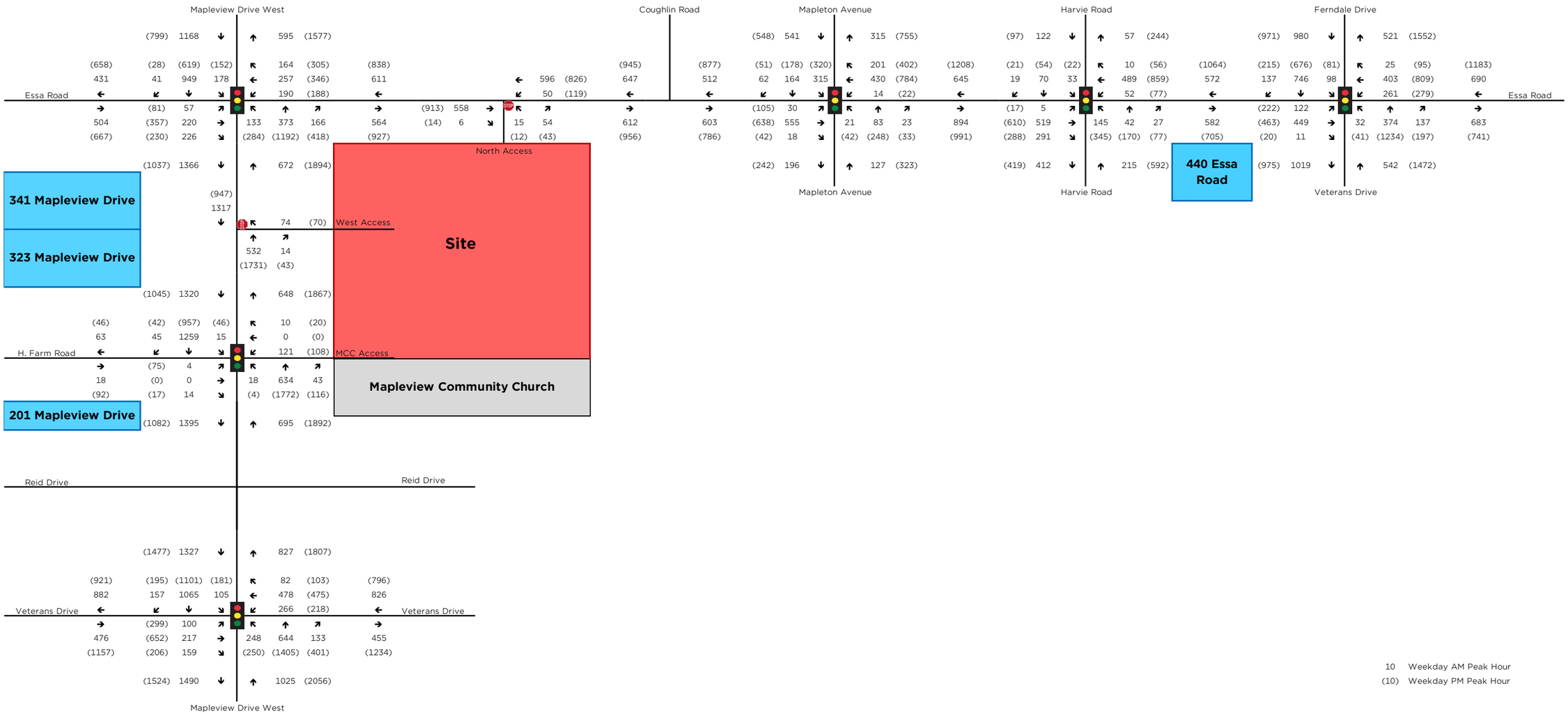
MAPLEVIEW & ESSA DEVELOPMENT

Figure 23: Traffic Volumes – 2031 Total



MAPLEVIEW & ESSA DEVELOPMENT

Figure 24: Traffic Volumes – 2036 Total



10 Weekday AM Peak Hour
(10) Weekday PM Peak Hour

MAPLEVIEW & ESSA DEVELOPMENT

Figure 25: Traffic Volumes – 2041 Total

MAPLEVIEW & ESSA DEVELOPMENT

Figure 26: Sight Lines

Appendix A:
Traffic Counts

Spectrum

Turning Movement Count
Location Name: ESSA RD & MAPLEVIEW DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Turning Movement Count (1 . ESSA RD & MAPLEVIEW DR)

Start Time	N Approach ESSA RD						E Approach MAPLEVIEW DR						S Approach ESSA RD						W Approach MAPLEVIEW DR						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	12	27	11	0	0	50	6	36	10	0	0	52	29	22	3	0	1	54	3	120	9	0	0	132	288	
07:15:00	23	36	23	0	2	82	4	66	14	0	0	84	20	29	4	0	0	53	8	164	19	0	0	191	410	
07:30:00	33	42	35	0	2	110	10	52	12	0	0	74	40	37	6	0	0	83	6	155	27	0	1	188	455	
07:45:00	37	44	25	0	0	106	12	75	26	0	1	113	39	32	8	0	0	79	10	213	35	0	0	258	556	1709
08:00:00	26	54	31	0	0	111	18	67	21	0	0	106	45	47	13	0	1	105	6	172	28	0	0	206	528	1949
08:15:00	27	44	28	0	1	99	16	55	17	0	1	88	28	41	13	0	2	82	2	161	38	0	2	201	470	2009
08:30:00	24	38	20	0	0	82	12	62	21	0	0	95	35	38	8	0	0	81	14	167	35	0	0	216	474	2028
08:45:00	24	37	31	0	2	92	15	58	19	0	2	92	55	47	5	0	0	107	5	161	34	0	0	200	491	1963
09:00:00	37	41	46	0	1	124	15	58	11	0	0	84	34	25	7	0	1	66	7	138	21	0	2	166	440	1875
09:15:00	23	42	33	0	1	98	22	71	16	0	0	109	32	17	5	0	0	54	3	132	21	0	0	156	417	1822
09:30:00	17	21	21	0	0	59	18	60	16	0	0	94	46	22	5	0	0	73	4	134	23	0	0	161	387	1735
09:45:00	15	32	30	0	2	77	15	57	15	0	0	87	36	27	4	0	0	67	4	105	20	0	0	129	360	1604
BREAK																										
15:00:00	30	42	18	0	0	90	36	143	37	0	1	216	38	36	7	0	1	81	10	105	31	0	0	146	533	
15:15:00	40	62	23	0	1	125	42	144	33	0	1	219	55	62	11	0	0	128	11	113	24	0	1	148	620	
15:30:00	42	60	34	0	1	136	44	157	35	0	0	236	48	64	19	0	0	131	10	111	39	0	0	160	663	
15:45:00	41	59	39	0	0	139	44	136	45	0	0	225	51	67	15	0	0	133	10	135	39	0	0	184	681	2497
16:00:00	42	47	19	0	0	108	34	172	36	0	0	242	41	65	16	0	0	122	0	122	31	0	0	153	625	2589
16:15:00	56	49	33	0	0	138	54	178	39	0	0	271	41	67	16	0	0	124	7	119	30	0	1	156	689	2658
16:30:00	48	51	18	0	1	117	51	192	38	0	0	281	35	61	10	0	1	106	2	131	23	0	0	156	660	2655
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17:00:00	48	60	21	0	1	129	58	233	49	0	0	340	44	64	15	0	0	123	10	93	15	1	0	119	711	2807
17:15:00	53	66	30	0	1	149	61	220	56	0	0	337	37	73	11	0	0	121	4	105	37	0	0	146	753	2871
17:30:00	65	62	15	0	0	142	75	226	34	0	0	335	29	55	11	0	1	95	6	118	26	0	0	150	722	2933
17:45:00	38	40	37	0	2	115	43	180	30	0	2	253	36	49	16	0	0	101	11	96	27	0	0	134	603	2789
Grand Total	853	1114	652	0	18	2619	759	2913	688	0	8	4360	927	1108	250	0	8	2285	155	3197	666	1	7	4019	**13283**	-
Approach%	32.6%	42.5%	24.9%	0%		-	17.4%	66.8%	15.8%	0%		-	40.6%	48.5%	10.9%	0%		-	3.9%	79.5%	16.6%	0%		-	-	-
Totals %	6.4%	8.4%	4.9%	0%		19.7%	5.7%	21.9%	5.2%	0%		32.8%	7%	8.3%	1.9%	0%		17.2%	1.2%	24.1%	5%	0%		30.3%	-	-
Heavy	15	30	25	0		-	26	62	36	0		-	41	38	8	0		-	13	50	11	0		-	-	-
Heavy %	1.8%	2.7%	3.8%	0%		-	3.4%	2.1%	5.2%	0%		-	4.4%	3.4%	3.2%	0%		-	8.4%	1.6%	1.7%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Spectrum

Turning Movement Count
Location Name: ESSA RD & MAPLEVIEW DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 07:45 AM - 08:45 AM Weather: Overcast Clouds (-3.26 °C)

Start Time	N Approach ESSA RD						E Approach MAPLEVIEW DR						S Approach ESSA RD						W Approach MAPLEVIEW DR						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:45:00	37	44	25	0	0	106	12	75	26	0	1	113	39	32	8	0	0	79	10	213	35	0	0	258	556
08:00:00	26	54	31	0	0	111	18	67	21	0	0	106	45	47	13	0	1	105	6	172	28	0	0	206	528
08:15:00	27	44	28	0	1	99	16	55	17	0	1	88	28	41	13	0	2	82	2	161	38	0	2	201	470
08:30:00	24	38	20	0	0	82	12	62	21	0	0	95	35	38	8	0	0	81	14	167	35	0	0	216	474
Grand Total	114	180	104	0	1	398	58	259	85	0	2	402	147	158	42	0	3	347	32	713	136	0	2	881	**2028**
Approach%	28.6%	45.2%	26.1%	0%		-	14.4%	64.4%	21.1%	0%		-	42.4%	45.5%	12.1%	0%		-	3.6%	80.9%	15.4%	0%		-	**-**
Totals %	5.6%	8.9%	5.1%	0%		19.6%	2.9%	12.8%	4.2%	0%		19.8%	7.2%	7.8%	2.1%	0%		17.1%	1.6%	35.2%	6.7%	0%		43.4%	**-**
PHF	0.77	0.83	0.84	0		0.9	0.81	0.86	0.82	0		0.89	0.82	0.84	0.81	0		0.83	0.57	0.84	0.89	0		0.85	**-**
Heavy	3	9	4	0		16	8	19	14	0		41	10	7	6	0		23	8	9	1	0		18	**-**
Heavy %	2.6%	5%	3.8%	0%		4%	13.8%	7.3%	16.5%	0%		10.2%	6.8%	4.4%	14.3%	0%		6.6%	25%	1.3%	0.7%	0%		2%	**-**
Lights	111	171	100	0		382	50	240	70	0		360	137	151	36	0		324	24	704	135	0		863	**-**
Lights %	97.4%	95%	96.2%	0%		96%	86.2%	92.7%	82.4%	0%		89.6%	93.2%	95.6%	85.7%	0%		93.4%	75%	98.7%	99.3%	0%		98%	**-**
Single-Unit Trucks	1	1	1	0		3	1	14	6	0		21	0	2	0	0		2	1	5	0	0		6	**-**
Single-Unit Trucks %	0.9%	0.6%	1%	0%		0.8%	1.7%	5.4%	7.1%	0%		5.2%	0%	1.3%	0%	0%		0.6%	3.1%	0.7%	0%	0%		0.7%	**-**
Buses	1	8	3	0		12	4	2	7	0		13	10	4	6	0		20	7	2	1	0		10	**-**
Buses %	0.9%	4.4%	2.9%	0%		3%	6.9%	0.8%	8.2%	0%		3.2%	6.8%	2.5%	14.3%	0%		5.8%	21.9%	0.3%	0.7%	0%		1.1%	**-**
Articulated Trucks	1	0	0	0		1	3	3	1	0		7	0	1	0	0		1	0	2	0	0		2	**-**
Articulated Trucks %	0.9%	0%	0%	0%		0.3%	5.2%	1.2%	1.2%	0%		1.7%	0%	0.6%	0%	0%		0.3%	0%	0.3%	0%	0%		0.2%	**-**
Bicycles on Road	0	0	0	0		0	0	0	1	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	1.2%	0%		0.2%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	-	12.5%		-	-	-	-	25%		-	-	-	-	37.5%		-	-	-	-	25%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: ESSA RD & MAPLEVIEW DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

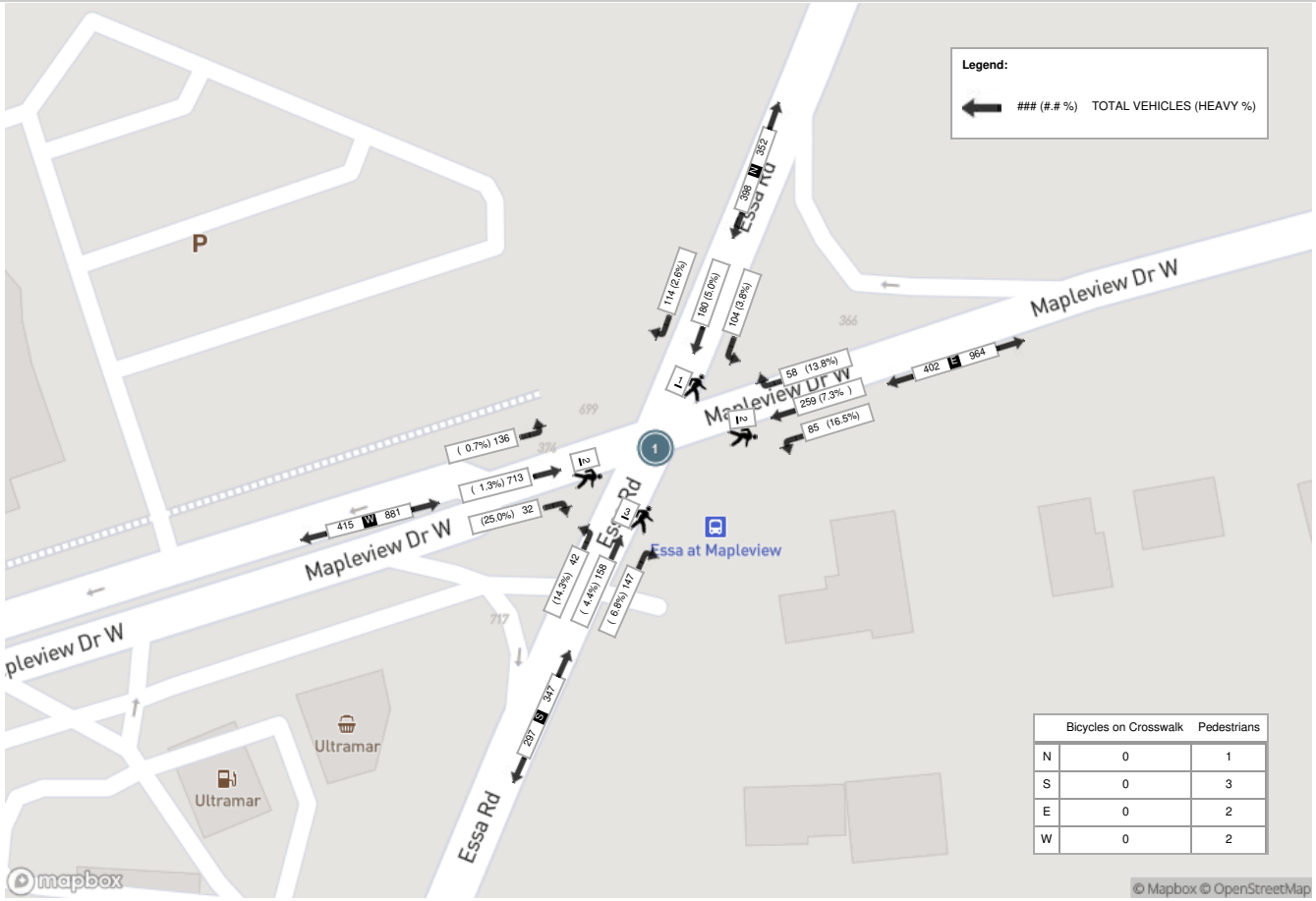
Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (-1.06 °C)

Start Time	N Approach ESSA RD						E Approach MAPLEVIEW DR						S Approach ESSA RD						W Approach MAPLEVIEW DR						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	52	58	31	0	0	141	54	215	58	0	0	327	33	61	22	0	0	116	2	127	34	0	0	163	747
17:00:00	48	60	21	0	1	129	58	233	49	0	0	340	44	64	15	0	0	123	10	93	15	1	0	119	711
17:15:00	53	66	30	0	1	149	61	220	56	0	0	337	37	73	11	0	0	121	4	105	37	0	0	146	753
17:30:00	65	62	15	0	0	142	75	226	34	0	0	335	29	55	11	0	1	95	6	118	26	0	0	150	722
Grand Total	218	246	97	0	2	561	248	894	197	0	0	1339	143	253	59	0	1	455	22	443	112	1	0	578	**2933**
Approach%	38.9%	43.9%	17.3%	0%		-	18.5%	66.8%	14.7%	0%		-	31.4%	55.6%	13%	0%		-	3.8%	76.6%	19.4%	0.2%		-	-
Totals %	7.4%	8.4%	3.3%	0%		19.1%	8.5%	30.5%	6.7%	0%		45.7%	4.9%	8.6%	2%	0%		15.5%	0.8%	15.1%	3.8%	0%		19.7%	-
PHF	0.84	0.93	0.78	0		0.94	0.83	0.96	0.85	0		0.98	0.81	0.87	0.67	0		0.92	0.55	0.87	0.76	0.25		0.89	-
Heavy	2	2	4	0		8	2	6	5	0		13	4	2	0	0		6	0	12	1	0		13	-
Heavy %	0.9%	0.8%	4.1%	0%		1.4%	0.8%	0.7%	2.5%	0%		1%	2.8%	0.8%	0%	0%		1.3%	0%	2.7%	0.9%	0%		2.2%	-
Lights	216	244	93	0		553	246	887	192	0		1325	139	251	59	0		449	22	431	111	1		565	-
Lights %	99.1%	99.2%	95.9%	0%		98.6%	99.2%	99.2%	97.5%	0%		99%	97.2%	99.2%	100%	0%		98.7%	100%	97.3%	99.1%	100%		97.8%	-
Single-Unit Trucks	1	1	1	0		3	0	4	3	0		7	2	2	0	0		4	0	8	1	0		9	-
Single-Unit Trucks %	0.5%	0.4%	1%	0%		0.5%	0%	0.4%	1.5%	0%		0.5%	1.4%	0.8%	0%	0%		0.9%	0%	1.8%	0.9%	0%		1.6%	-
Buses	1	0	2	0		3	2	1	2	0		5	2	0	0	0		2	0	1	0	0		1	-
Buses %	0.5%	0%	2.1%	0%		0.5%	0.8%	0.1%	1%	0%		0.4%	1.4%	0%	0%	0%		0.4%	0%	0.2%	0%	0%		0.2%	-
Articulated Trucks	0	1	1	0		2	0	1	0	0		1	0	0	0	0		0	0	3	0	0		3	-
Articulated Trucks %	0%	0.4%	1%	0%		0.4%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.5%	-
Bicycles on Road	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	33.3%		-	-	-	-	0%		-	-	-	-	33.3%		-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	33.3%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

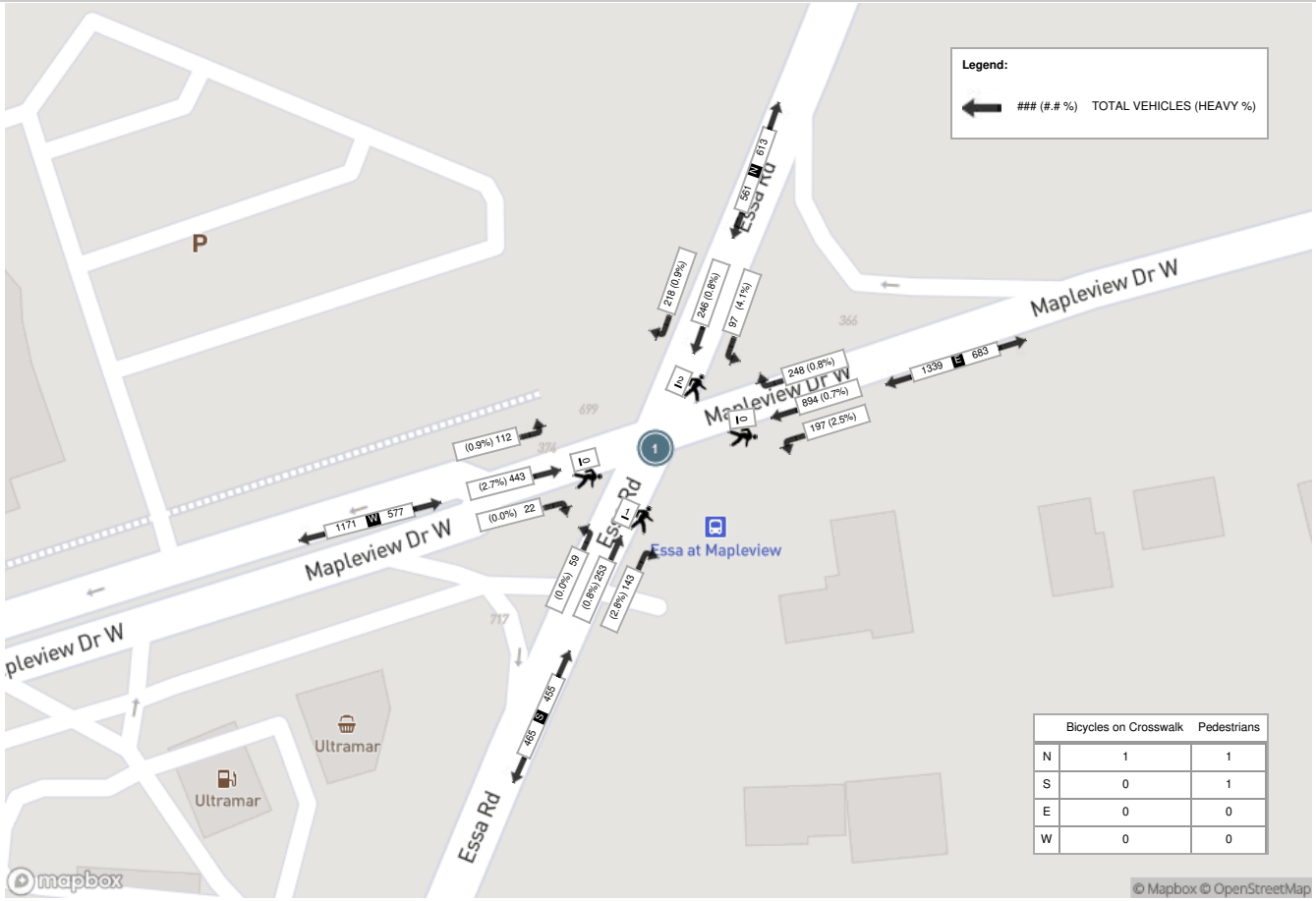
Peak Hour: 07:45 AM - 08:45 AM **Weather: Overcast Clouds (-3.26 °C)**



	Bicycles on Crosswalk	Pedestrians
N	0	1
S	0	3
E	0	2
W	0	2

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (-1.06 °C)



	Bicycles on Crosswalk	Pedestrians
N	1	1
S	0	1
E	0	0
W	0	0

Spectrum

Turning Movement Count
Location Name: MAPLEVIEW DR & HOLLYHOLME FARM RD
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Turning Movement Count (5 . MAPLEVIEW DR & HOLLYHOLME FARM RD)

Start Time	N Approach HOLLYHOLME FARM RD						E Approach MAPLEVIEW DR						S Approach HOLLYHOLME FARM RD						W Approach MAPLEVIEW DR						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	0	0	0	0	0	0	0	57	0	0	0	57	1	0	0	0	0	1	2	167	0	0	0	169	227	
07:15:00	0	0	0	0	0	0	0	84	1	0	0	85	0	1	1	0	1	2	6	187	0	1	0	194	281	
07:30:00	1	0	0	0	1	1	0	79	2	0	1	81	0	0	3	0	0	3	9	231	0	0	0	240	325	
07:45:00	1	0	0	0	0	1	1	108	6	0	0	115	2	0	0	0	1	2	10	261	0	0	0	271	389	1222
08:00:00	0	0	0	0	0	0	0	105	3	0	0	108	2	0	1	0	1	3	11	238	0	0	0	249	360	1355
08:15:00	0	0	0	0	0	0	0	94	3	0	0	97	2	0	1	0	0	3	11	218	1	0	0	230	330	1404
08:30:00	0	0	1	0	0	1	0	104	2	0	0	106	6	0	1	0	0	7	3	211	0	0	0	214	328	1407
08:45:00	0	0	0	0	0	0	1	99	3	0	0	103	4	0	5	0	2	9	9	245	2	0	0	256	368	1386
09:00:00	1	0	1	0	0	2	2	85	1	0	0	88	4	0	1	0	0	5	6	210	2	1	0	219	314	1340
09:15:00	0	0	0	0	1	0	1	104	2	0	0	107	5	0	2	0	0	7	5	195	1	0	0	201	315	1325
09:30:00	0	0	0	0	0	0	4	84	1	0	1	89	6	0	5	0	0	11	7	185	0	0	0	192	292	1289
09:45:00	0	0	0	0	1	0	3	95	2	0	1	100	4	1	0	0	1	5	8	175	3	0	0	186	291	1212
BREAK																										
15:00:00	1	0	0	0	1	1	1	220	5	1	0	227	3	0	12	0	0	15	9	159	0	0	0	168	411	
15:15:00	2	0	0	0	1	2	2	229	2	0	0	233	4	0	7	0	2	11	14	175	2	0	0	191	437	
15:30:00	0	0	1	0	1	1	1	234	3	0	0	238	7	0	7	0	0	14	11	186	0	0	0	197	450	
15:45:00	3	0	0	0	0	3	2	232	1	1	0	236	6	0	14	0	2	20	13	201	1	0	0	215	474	1772
16:00:00	1	0	2	0	1	3	0	232	2	0	0	234	10	1	21	0	0	32	4	189	1	0	1	194	463	1824
16:15:00	1	0	0	0	1	1	0	276	3	0	2	279	5	0	13	0	2	18	9	180	0	0	0	189	487	1874
16:30:00	1	0	0	0	2	1	1	278	1	0	0	280	5	0	12	0	0	17	6	181	1	0	0	188	486	1910
16:45:00	1	0	2	0	0	3	0	299	2	0	0	301	4	0	12	0	0	16	8	179	0	0	0	187	507	1943
17:00:00	0	0	0	0	1	0	0	343	0	0	1	343	5	0	26	0	0	31	10	159	0	0	0	169	543	2023
17:15:00	1	0	0	0	0	1	2	318	1	0	0	321	2	0	10	0	0	12	10	171	0	0	0	181	515	2051
17:30:00	0	0	0	0	0	0	4	323	0	0	0	327	3	0	14	0	0	17	5	157	2	0	0	164	508	2073
17:45:00	1	0	2	0	0	3	10	252	1	0	0	263	3	0	7	0	1	10	5	162	4	0	0	171	447	2013
Grand Total	15	0	9	0	11	24	35	4334	47	2	6	4418	93	3	175	0	13	271	191	4622	20	2	1	4835	**9548**	-
Approach%	62.5%	0%	37.5%	0%		-	0.8%	98.1%	1.1%	0%		-	34.3%	1.1%	64.6%	0%		-	4%	95.6%	0.4%	0%		-	-	-
Totals %	0.2%	0%	0.1%	0%		0.3%	0.4%	45.4%	0.5%	0%		46.3%	1%	0%	1.8%	0%		2.8%	2%	48.4%	0.2%	0%		50.6%	-	-
Heavy	0	0	0	0		-	1	128	13	0		-	10	0	3	0		-	4	119	0	0		-	-	-
Heavy %	0%	0%	0%	0%		-	2.9%	3%	27.7%	0%		-	10.8%	0%	1.7%	0%		-	2.1%	2.6%	0%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Spectrum

Turning Movement Count
Location Name: MAPLEVIEW DR & HOLLYHOLME FARM RD
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 07:45 AM - 08:45 AM Weather: Overcast Clouds (-3.26 °C)

Start Time	N Approach HOLLYHOLME FARM RD						E Approach MAPLEVIEW DR						S Approach HOLLYHOLME FARM RD						W Approach MAPLEVIEW DR						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:45:00	1	0	0	0	0	1	1	108	6	0	0	115	2	0	0	0	1	2	10	261	0	0	0	271	389
08:00:00	0	0	0	0	0	0	0	105	3	0	0	108	2	0	1	0	1	3	11	238	0	0	0	249	360
08:15:00	0	0	0	0	0	0	0	94	3	0	0	97	2	0	1	0	0	3	11	218	1	0	0	230	330
08:30:00	0	0	1	0	0	1	0	104	2	0	0	106	6	0	1	0	0	7	3	211	0	0	0	214	328
Grand Total	1	0	1	0	0	2	1	411	14	0	0	426	12	0	3	0	2	15	35	928	1	0	0	964	**1407**
Approach%	50%	0%	50%	0%		-	0.2%	96.5%	3.3%	0%		-	80%	0%	20%	0%		-	3.6%	96.3%	0.1%	0%		-	**-**
Totals %	0.1%	0%	0.1%	0%		0.1%	0.1%	29.2%	1%	0%		30.3%	0.9%	0%	0.2%	0%		1.1%	2.5%	66%	0.1%	0%		68.5%	**-**
PHF	0.25	0	0.25	0		0.5	0.25	0.95	0.58	0		0.93	0.5	0	0.75	0		0.54	0.8	0.89	0.25	0		0.89	**-**
Heavy	0	0	0	0		0	0	43	4	0		47	4	0	0	0		4	0	26	0	0		26	**-**
Heavy %	0%	0%	0%	0%		0%	0%	10.5%	28.6%	0%		11%	33.3%	0%	0%	0%		26.7%	0%	2.8%	0%	0%		2.7%	**-**
Lights	1	0	1	0		2	1	367	10	0		378	8	0	3	0		11	35	902	1	0		938	**-**
Lights %	100%	0%	100%	0%		100%	100%	89.3%	71.4%	0%		88.7%	66.7%	0%	100%	0%		73.3%	100%	97.2%	100%	0%		97.3%	**-**
Single-Unit Trucks	0	0	0	0		0	0	20	3	0		23	3	0	0	0		3	0	7	0	0		7	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	4.9%	21.4%	0%		5.4%	25%	0%	0%	0%		20%	0%	0.8%	0%	0%		0.7%	**-**
Buses	0	0	0	0		0	0	15	0	0		15	0	0	0	0		0	0	16	0	0		16	**-**
Buses %	0%	0%	0%	0%		0%	0%	3.6%	0%	0%		3.5%	0%	0%	0%	0%		0%	0%	1.7%	0%	0%		1.7%	**-**
Articulated Trucks	0	0	0	0		0	0	8	1	0		9	1	0	0	0		1	0	3	0	0		3	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	1.9%	7.1%	0%		2.1%	8.3%	0%	0%	0%		6.7%	0%	0.3%	0%	0%		0.3%	**-**
Bicycles on Road	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	100%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: MAPLEVIEW DR & HOLLYHOLME FARM RD
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (-1.06 °C)

Start Time	N Approach HOLLYHOLME FARM RD						E Approach MAPLEVIEW DR						S Approach HOLLYHOLME FARM RD						W Approach MAPLEVIEW DR						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	1	0	2	0	0	3	0	299	2	0	0	301	4	0	12	0	0	16	8	179	0	0	0	187	507
17:00:00	0	0	0	0	1	0	0	343	0	0	1	343	5	0	26	0	0	31	10	159	0	0	0	169	543
17:15:00	1	0	0	0	0	1	2	318	1	0	0	321	2	0	10	0	0	12	10	171	0	0	0	181	515
17:30:00	0	0	0	0	0	0	4	323	0	0	0	327	3	0	14	0	0	17	5	157	2	0	0	164	508
Grand Total	2	0	2	0	1	4	6	1283	3	0	1	1292	14	0	62	0	0	76	33	666	2	0	0	701	**2073**
Approach%	50%	0%	50%	0%		-	0.5%	99.3%	0.2%	0%		-	18.4%	0%	81.6%	0%		-	4.7%	95%	0.3%	0%		-	**-**
Totals %	0.1%	0%	0.1%	0%		0.2%	0.3%	61.9%	0.1%	0%		62.3%	0.7%	0%	3%	0%		3.7%	1.6%	32.1%	0.1%	0%		33.8%	**-**
PHF	0.5	0	0.25	0		0.33	0.38	0.94	0.38	0		0.94	0.7	0	0.6	0		0.61	0.83	0.93	0.25	0		0.94	**-**
Heavy	0	0	0	0		0	0	11	0	0		11	0	0	0	0		0	1	19	0	0		20	**-**
Heavy %	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.9%	0%	0%	0%	0%		0%	3%	2.9%	0%	0%		2.9%	**-**
Lights	2	0	2	0		4	6	1272	3	0		1281	14	0	62	0		76	32	647	2	0		681	**-**
Lights %	100%	0%	100%	0%		100%	100%	99.1%	100%	0%		99.1%	100%	0%	100%	0%		100%	97%	97.1%	100%	0%		97.1%	**-**
Single-Unit Trucks	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	1	13	0	0		14	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.4%	0%	0%	0%	0%		0%	3%	2%	0%	0%		2%	**-**
Buses	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	4	0	0		4	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.4%	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.6%	**-**
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	2	0	0		2	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	**-**
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%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	50%		-	-	-	-	50%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Peak Hour: 07:45 AM - 08:45 AM **Weather: Overcast Clouds (-3.26 °C)**

	Bicycles on Crosswalk	Pedestrians
N	0	0
S	0	2
E	0	0
W	0	0

Peak Hour: 04:45 PM - 05:45 PM **Weather: Overcast Clouds (-1.06 °C)**

	Bicycles on Crosswalk	Pedestrians
N	0	1
S	0	0
E	0	1
W	0	0

Spectrum

Turning Movement Count
Location Name: MAPLEVIEW DR & VETERANS DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Turning Movement Count (6 . MAPLEVIEW DR & VETERANS DR)

Start Time	N Approach VETERANS DR						E Approach MAPLEVIEW DR						S Approach VETERANS DR						W Approach MAPLEVIEW DR						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	10	29	53	0	0	92	18	54	25	0	1	97	14	8	3	0	0	25	4	143	7	0	0	154	368	
07:15:00	11	33	44	0	0	88	15	95	32	0	2	142	11	12	4	0	4	27	12	162	9	0	0	183	440	
07:30:00	10	45	60	0	0	115	22	94	40	0	0	156	18	16	8	0	0	42	8	201	10	0	0	219	532	
07:45:00	15	59	71	0	0	145	18	142	66	0	0	226	28	25	13	0	0	66	9	182	17	0	0	208	645	1985
08:00:00	19	57	63	0	0	139	30	101	28	0	0	159	31	22	16	0	1	69	22	214	15	0	0	251	618	2235
08:15:00	10	51	52	0	0	113	28	97	51	0	0	176	26	23	15	0	3	64	11	173	19	0	0	203	556	2351
08:30:00	18	59	56	0	0	133	31	102	46	0	0	179	30	24	13	0	1	67	10	191	13	0	0	214	593	2412
08:45:00	17	51	76	0	2	144	24	115	37	0	1	176	30	23	5	0	2	58	17	183	28	0	0	228	606	2373
09:00:00	16	65	88	0	0	169	32	88	45	0	0	165	28	18	12	0	1	58	16	197	17	0	0	230	622	2377
09:15:00	12	70	78	0	1	160	46	120	53	0	0	219	30	17	10	0	2	57	21	155	20	0	0	196	632	2453
09:30:00	14	43	51	0	0	108	35	97	42	0	0	174	35	23	3	0	2	61	19	189	12	1	0	221	564	2424
09:45:00	12	54	62	0	0	128	33	119	50	0	1	202	33	23	8	0	0	64	19	161	10	0	0	190	584	2402
BREAK																										
15:00:00	25	44	75	0	0	144	85	179	48	0	2	312	47	35	21	0	2	103	10	161	20	0	0	191	750	
15:15:00	13	49	49	0	1	111	75	221	47	0	1	343	37	24	11	0	3	72	13	180	19	0	0	212	738	
15:30:00	17	54	62	0	0	133	65	206	43	0	3	314	48	33	20	0	1	101	21	198	19	1	0	239	787	
15:45:00	22	67	64	0	0	153	53	186	67	0	0	306	51	39	15	0	0	105	30	169	31	1	0	231	795	3070
16:00:00	20	61	54	0	0	135	67	197	52	0	1	316	59	57	21	0	0	137	8	196	26	0	0	230	818	3138
16:15:00	18	64	67	1	1	150	78	230	58	0	0	366	45	77	22	0	3	144	9	179	23	1	0	212	872	3272
16:30:00	30	75	62	0	2	167	83	211	43	0	1	337	59	69	19	0	0	147	13	203	24	0	0	240	891	3376
16:45:00	25	81	74	0	1	180	92	266	59	0	0	417	35	78	30	0	2	143	19	218	28	0	1	265	1005	3586
17:00:00	32	59	61	0	4	152	106	254	40	0	3	400	75	128	37	0	0	240	10	164	31	0	0	205	997	3765
17:15:00	17	58	48	0	0	123	123	234	49	0	1	406	40	72	35	0	0	147	16	162	32	0	0	210	886	3779
17:30:00	14	55	59	0	0	128	73	240	39	0	0	352	45	77	44	0	0	166	14	158	14	0	0	186	832	3720
17:45:00	10	51	51	0	1	112	70	215	48	0	0	333	33	60	30	0	0	123	15	153	18	1	0	187	755	3470
Grand Total	407	1334	1480	1	13	3222	1302	3863	1108	0	17	6273	888	983	415	0	27	2286	346	4292	462	5	1	5105	**16886**	-
Approach%	12.6%	41.4%	45.9%	0%		-	20.8%	61.6%	17.7%	0%		-	38.8%	43%	18.2%	0%		-	6.8%	84.1%	9%	0.1%		-	**-**	-
Totals %	2.4%	7.9%	8.8%	0%		19.1%	7.7%	22.9%	6.6%	0%		37.1%	5.3%	5.8%	2.5%	0%		13.5%	2%	25.4%	2.7%	0%		30.2%	**-**	-
Heavy	13	26	46	0		-	32	114	48	0		-	35	13	27	0		-	17	119	13	0		-	**-**	-
Heavy %	3.2%	1.9%	3.1%	0%		-	2.5%	3%	4.3%	0%		-	3.9%	1.3%	6.5%	0%		-	4.9%	2.8%	2.8%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: MAPLEVIEW DR & VETERANS DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 08:30 AM - 09:30 AM Weather: Overcast Clouds (-3.26 °C)

Start Time	N Approach VETERANS DR						E Approach MAPLEVIEW DR						S Approach VETERANS DR						W Approach MAPLEVIEW DR						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
08:30:00	18	59	56	0	0	133	31	102	46	0	0	179	30	24	13	0	1	67	10	191	13	0	0	214	593
08:45:00	17	51	76	0	2	144	24	115	37	0	1	176	30	23	5	0	2	58	17	183	28	0	0	228	606
09:00:00	16	65	88	0	0	169	32	88	45	0	0	165	28	18	12	0	1	58	16	197	17	0	0	230	622
09:15:00	12	70	78	0	1	160	46	120	53	0	0	219	30	17	10	0	2	57	21	155	20	0	0	196	632
Grand Total	63	245	298	0	3	606	133	425	181	0	1	739	118	82	40	0	6	240	64	726	78	0	0	868	**2453**
Approach%	10.4%	40.4%	49.2%	0%		-	18%	57.5%	24.5%	0%		-	49.2%	34.2%	16.7%	0%		-	7.4%	83.6%	9%	0%		-	**-**
Totals %	2.6%	10%	12.1%	0%		24.7%	5.4%	17.3%	7.4%	0%		30.1%	4.8%	3.3%	1.6%	0%		9.8%	2.6%	29.6%	3.2%	0%		35.4%	**-**
PHF	0.88	0.88	0.85	0		0.9	0.72	0.89	0.85	0		0.84	0.98	0.85	0.77	0		0.9	0.76	0.92	0.7	0		0.94	**-**
Heavy	4	11	10	0		25	6	22	6	0		34	8	1	6	0		15	7	32	2	0		41	**-**
Heavy %	6.3%	4.5%	3.4%	0%		4.1%	4.5%	5.2%	3.3%	0%		4.6%	6.8%	1.2%	15%	0%		6.3%	10.9%	4.4%	2.6%	0%		4.7%	**-**
Lights	59	234	288	0		581	127	403	175	0		705	110	81	34	0		225	57	694	76	0		827	**-**
Lights %	93.7%	95.5%	96.6%	0%		95.9%	95.5%	94.8%	96.7%	0%		95.4%	93.2%	98.8%	85%	0%		93.8%	89.1%	95.6%	97.4%	0%		95.3%	**-**
Single-Unit Trucks	2	7	2	0		11	4	19	3	0		26	4	1	2	0		7	4	22	2	0		28	**-**
Single-Unit Trucks %	3.2%	2.9%	0.7%	0%		1.8%	3%	4.5%	1.7%	0%		3.5%	3.4%	1.2%	5%	0%		2.9%	6.3%	3%	2.6%	0%		3.2%	**-**
Buses	1	1	3	0		5	2	2	1	0		5	2	0	3	0		5	3	7	0	0		10	**-**
Buses %	1.6%	0.4%	1%	0%		0.8%	1.5%	0.5%	0.6%	0%		0.7%	1.7%	0%	7.5%	0%		2.1%	4.7%	1%	0%	0%		1.2%	**-**
Articulated Trucks	1	3	5	0		9	0	1	2	0		3	2	0	1	0		3	0	3	0	0		3	**-**
Articulated Trucks %	1.6%	1.2%	1.7%	0%		1.5%	0%	0.2%	1.1%	0%		0.4%	1.7%	0%	2.5%	0%		1.3%	0%	0.4%	0%	0%		0.3%	**-**
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%	**-**
Pedestrians	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	6	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	30%		-	-	-	-	10%		-	-	-	-	60%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

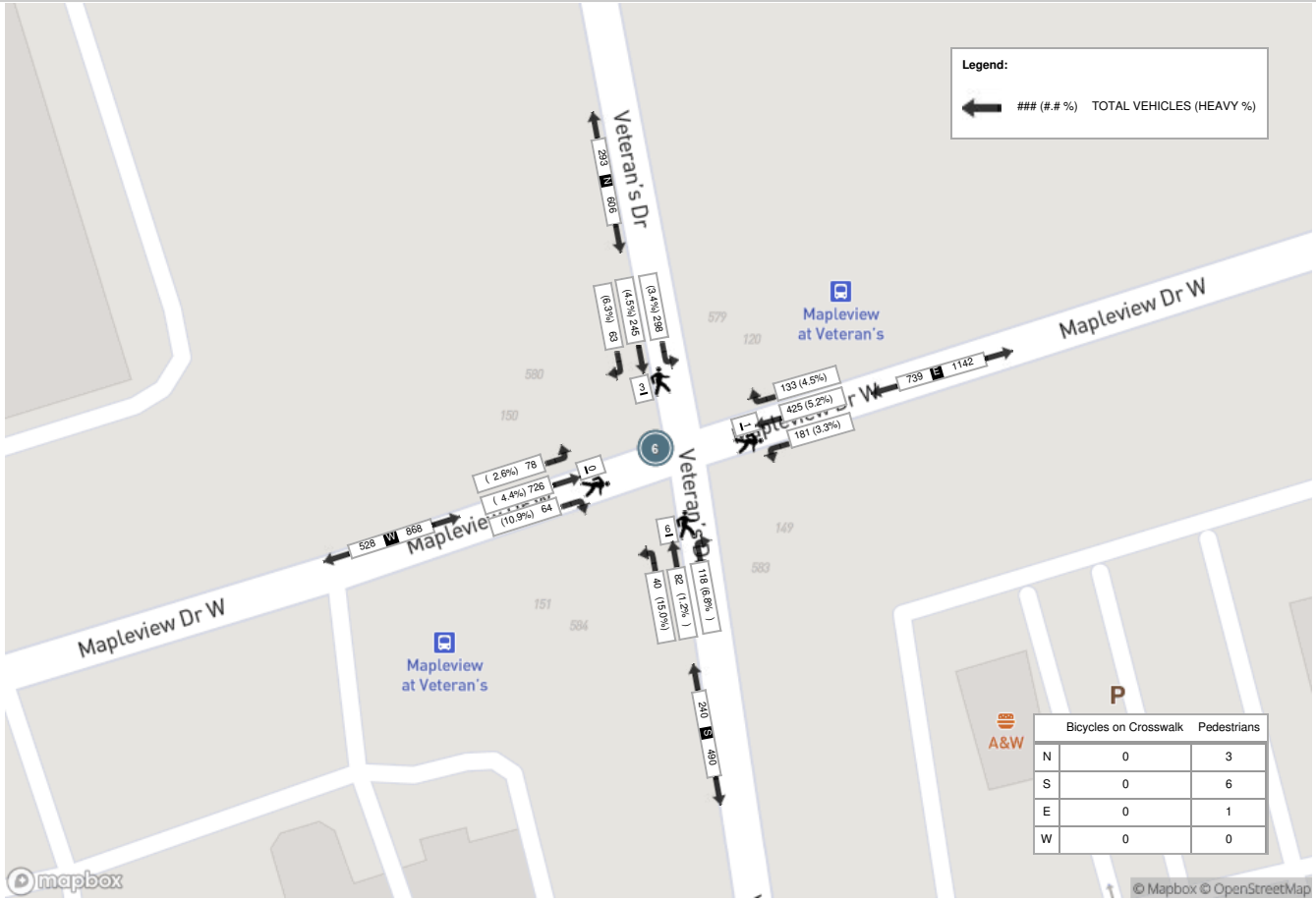
Turning Movement Count
Location Name: MAPLEVIEW DR & VETERANS DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

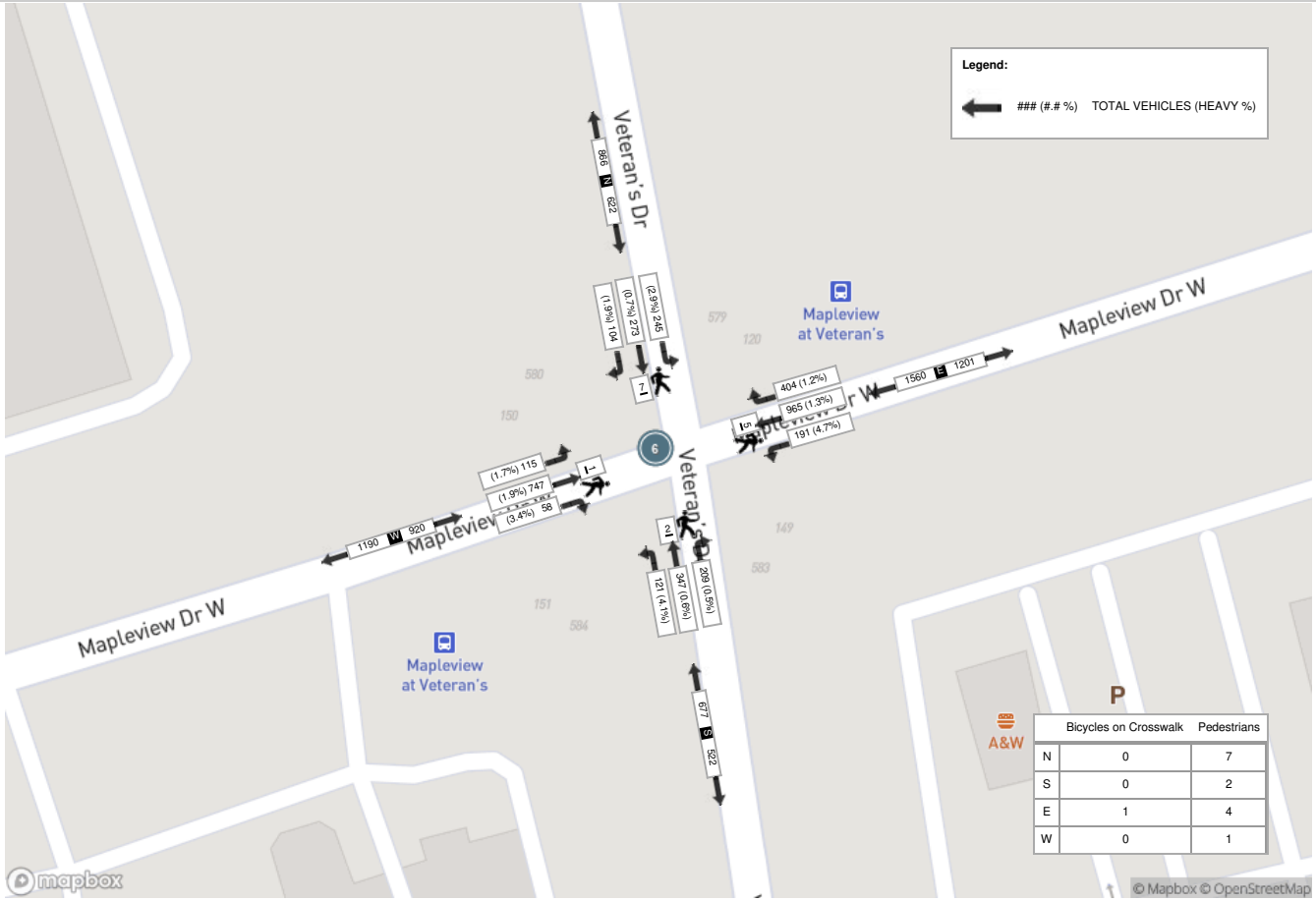
Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-1.06 °C)

Start Time	N Approach VETERANS DR						E Approach MAPLEVIEW DR						S Approach VETERANS DR						W Approach MAPLEVIEW DR						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	30	75	62	0	2	167	83	211	43	0	1	337	59	69	19	0	0	147	13	203	24	0	0	240	891
16:45:00	25	81	74	0	1	180	92	266	59	0	0	417	35	78	30	0	2	143	19	218	28	0	1	265	1005
17:00:00	32	59	61	0	4	152	106	254	40	0	3	400	75	128	37	0	0	240	10	164	31	0	0	205	997
17:15:00	17	58	48	0	0	123	123	234	49	0	1	406	40	72	35	0	0	147	16	162	32	0	0	210	886
Grand Total	104	273	245	0	7	622	404	965	191	0	5	1560	209	347	121	0	2	677	58	747	115	0	1	920	**3779**
Approach%	16.7%	43.9%	39.4%	0%		-	25.9%	61.9%	12.2%	0%		-	30.9%	51.3%	17.9%	0%		-	6.3%	81.2%	12.5%	0%		-	**-**
Totals %	2.8%	7.2%	6.5%	0%		16.5%	10.7%	25.5%	5.1%	0%		41.3%	5.5%	9.2%	3.2%	0%		17.9%	1.5%	19.8%	3%	0%		24.3%	**-**
PHF	0.81	0.84	0.83	0		0.86	0.82	0.91	0.81	0		0.94	0.7	0.68	0.82	0		0.71	0.76	0.86	0.9	0		0.87	**-**
Heavy	2	2	7	0		11	5	13	9	0		27	1	2	5	0		8	2	14	2	0		18	**-**
Heavy %	1.9%	0.7%	2.9%	0%		1.8%	1.2%	1.3%	4.7%	0%		1.7%	0.5%	0.6%	4.1%	0%		1.2%	3.4%	1.9%	1.7%	0%		2%	**-**
Lights	102	271	238	0		611	399	952	182	0		1533	208	345	116	0		669	56	733	113	0		902	**-**
Lights %	98.1%	99.3%	97.1%	0%		98.2%	98.8%	98.7%	95.3%	0%		98.3%	99.5%	99.4%	95.9%	0%		98.8%	96.6%	98.1%	98.3%	0%		98%	**-**
Single-Unit Trucks	2	1	0	0		3	2	10	8	0		20	1	2	3	0		6	1	7	1	0		9	**-**
Single-Unit Trucks %	1.9%	0.4%	0%	0%		0.5%	0.5%	1%	4.2%	0%		1.3%	0.5%	0.6%	2.5%	0%		0.9%	1.7%	0.9%	0.9%	0%		1%	**-**
Buses	0	0	2	0		2	2	2	0	0		4	0	0	2	0		2	1	3	0	0		4	**-**
Buses %	0%	0%	0.8%	0%		0.3%	0.5%	0.2%	0%	0%		0.3%	0%	0%	1.7%	0%		0.3%	1.7%	0.4%	0%	0%		0.4%	**-**
Articulated Trucks	0	1	5	0		6	1	1	1	0		3	0	0	0	0		0	0	4	1	0		5	**-**
Articulated Trucks %	0%	0.4%	2%	0%		1%	0.2%	0.1%	0.5%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.5%	0.9%	0%		0.5%	**-**
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%	**-**
Pedestrians	-	-	-	-	7	-	-	-	-	-	4	-	-	-	-	-	2	-	-	-	-	-	1	-	**-**
Pedestrians%	-	-	-	-	46.7%		-	-	-	-	26.7%		-	-	-	-	13.3%		-	-	-	-	6.7%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	6.7%		-	-	-	-	0%		-	-	-	-	0%		**-**

Peak Hour: 08:30 AM - 09:30 AM Weather: Overcast Clouds (-3.26 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-1.06 °C)



Spectrum

Turning Movement Count
Location Name: ESSA RD & MAPLETON AVE
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Turning Movement Count (2 . ESSA RD & MAPLETON AVE)

Start Time	N Approach ESSA RD						E Approach MAPLETON AVE						S Approach ESSA RD						W Approach MAPLETON AVE						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	24	39	1	0	1	64	2	11	2	0	0	15	3	42	2	0	0	47	8	21	36	0	3	65	191	
07:15:00	26	51	2	0	1	79	6	8	4	0	0	18	2	45	6	0	0	53	12	22	45	0	0	79	229	
07:30:00	26	79	5	0	3	110	2	14	4	0	0	20	1	66	10	0	1	77	9	20	66	0	1	95	302	
07:45:00	30	80	1	0	0	111	2	16	10	0	0	28	3	84	3	0	2	90	5	38	50	0	1	93	322	1044
08:00:00	31	73	4	0	1	108	3	11	9	0	0	23	6	60	13	0	1	79	14	30	49	0	1	93	303	1156
08:15:00	35	71	2	0	1	108	4	20	3	0	1	27	1	82	6	0	3	89	9	33	80	0	4	122	346	1273
08:30:00	42	59	3	0	0	104	8	21	4	0	1	33	7	73	5	0	3	85	4	34	63	0	2	101	323	1294
08:45:00	61	70	4	0	4	135	4	11	4	0	1	19	5	79	8	0	3	92	14	37	59	0	4	110	356	1328
09:00:00	37	85	3	0	1	125	3	17	6	0	2	26	0	64	3	0	3	67	24	32	59	0	2	115	333	1358
09:15:00	37	74	5	0	3	116	2	10	7	0	2	19	2	49	9	0	3	60	13	24	46	0	4	83	278	1290
09:30:00	33	49	4	0	0	86	3	18	5	0	2	26	1	46	5	0	2	52	7	19	52	0	3	78	242	1209
09:45:00	33	59	6	0	0	98	2	13	7	0	3	22	2	60	3	0	1	65	6	21	47	0	1	74	259	1112
BREAK																										
15:00:00	65	88	3	0	2	156	8	41	10	0	0	59	4	73	4	0	1	81	8	32	56	0	3	96	392	
15:15:00	77	112	5	0	0	194	6	25	6	0	3	37	8	78	15	0	5	101	12	29	54	0	2	95	427	
15:30:00	50	116	7	0	1	173	4	43	5	0	5	52	15	99	10	0	5	124	15	32	83	0	5	130	479	
15:45:00	87	143	5	0	1	235	5	25	4	0	0	34	9	108	22	0	3	139	11	30	59	0	4	100	508	1806
16:00:00	75	111	7	0	2	193	6	50	5	0	2	61	9	87	14	0	3	110	6	37	78	0	2	121	485	1899
16:15:00	84	111	13	0	1	208	6	31	12	0	1	49	9	100	12	0	4	121	8	40	76	0	4	124	502	1974
16:30:00	86	120	3	0	0	209	5	45	9	0	1	59	9	93	14	0	3	116	8	38	67	0	0	113	497	1992
16:45:00	87	139	8	0	0	234	6	56	13	0	2	75	4	77	24	0	5	105	16	45	53	0	5	114	528	2012
17:00:00	71	123	5	0	1	199	5	55	5	0	1	65	8	83	22	0	3	113	11	30	69	0	4	110	487	2014
17:15:00	106	145	3	0	2	254	11	49	8	0	2	68	10	114	17	0	7	141	7	34	76	0	5	117	580	2092
17:30:00	85	122	6	0	2	213	4	39	10	0	0	53	8	79	20	0	0	107	16	28	76	0	1	120	493	2088
17:45:00	64	107	4	0	2	175	4	37	7	0	2	48	8	77	11	0	7	96	10	42	64	0	4	116	435	1995
Grand Total	1352	2226	109	0	29	3687	111	666	159	0	31	936	134	1818	258	0	68	2210	253	748	1463	0	65	2464	**9297**	-
Approach%	36.7%	60.4%	3%	0%		-	11.9%	71.2%	17%	0%		-	6.1%	82.3%	11.7%	0%		-	10.3%	30.4%	59.4%	0%		-	-	-
Totals %	14.5%	23.9%	1.2%	0%		39.7%	1.2%	7.2%	1.7%	0%		10.1%	1.4%	19.6%	2.8%	0%		23.8%	2.7%	8%	15.7%	0%		26.5%	-	-
Heavy	30	45	2	0		-	4	6	3	0		-	4	53	22	0		-	18	7	30	0		-	-	-
Heavy %	2.2%	2%	1.8%	0%		-	3.6%	0.9%	1.9%	0%		-	3%	2.9%	8.5%	0%		-	7.1%	0.9%	2.1%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Spectrum

Turning Movement Count
Location Name: ESSA RD & MAPLETON AVE
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (-3.26 °C)

Start Time	N Approach ESSA RD						E Approach MAPLETON AVE						S Approach ESSA RD						W Approach MAPLETON AVE						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
08:15:00	35	71	2	0	1	108	4	20	3	0	1	27	1	82	6	0	3	89	9	33	80	0	4	122	346
08:30:00	42	59	3	0	0	104	8	21	4	0	1	33	7	73	5	0	3	85	4	34	63	0	2	101	323
08:45:00	61	70	4	0	4	135	4	11	4	0	1	19	5	79	8	0	3	92	14	37	59	0	4	110	356
09:00:00	37	85	3	0	1	125	3	17	6	0	2	26	0	64	3	0	3	67	24	32	59	0	2	115	333
Grand Total	175	285	12	0	6	472	19	69	17	0	5	105	13	298	22	0	12	333	51	136	261	0	12	448	**1358**
Approach%	37.1%	60.4%	2.5%	0%		-	18.1%	65.7%	16.2%	0%		-	3.9%	89.5%	6.6%	0%		-	11.4%	30.4%	58.3%	0%		-	**-**
Totals %	12.9%	21%	0.9%	0%		34.8%	1.4%	5.1%	1.3%	0%		7.7%	1%	21.9%	1.6%	0%		24.5%	3.8%	10%	19.2%	0%		33%	**-**
PHF	0.72	0.84	0.75	0		0.87	0.59	0.82	0.71	0		0.8	0.46	0.91	0.69	0		0.9	0.53	0.92	0.82	0		0.92	**-**
Heavy	5	13	1	0		19	0	2	0	0		2	1	10	5	0		16	2	1	12	0		15	**-**
Heavy %	2.9%	4.6%	8.3%	0%		4%	0%	2.9%	0%	0%		1.9%	7.7%	3.4%	22.7%	0%		4.8%	3.9%	0.7%	4.6%	0%		3.3%	**-**
Lights	170	272	11	0		453	19	67	17	0		103	12	288	17	0		317	49	135	249	0		433	**-**
Lights %	97.1%	95.4%	91.7%	0%		96%	100%	97.1%	100%	0%		98.1%	92.3%	96.6%	77.3%	0%		95.2%	96.1%	99.3%	95.4%	0%		96.7%	**-**
Single-Unit Trucks	0	9	0	0		9	0	1	0	0		1	0	4	1	0		5	0	0	3	0		3	**-**
Single-Unit Trucks %	0%	3.2%	0%	0%		1.9%	0%	1.4%	0%	0%		1%	0%	1.3%	4.5%	0%		1.5%	0%	0%	1.1%	0%		0.7%	**-**
Buses	5	3	1	0		9	0	1	0	0		1	1	4	3	0		8	2	1	8	0		11	**-**
Buses %	2.9%	1.1%	8.3%	0%		1.9%	0%	1.4%	0%	0%		1%	7.7%	1.3%	13.6%	0%		2.4%	3.9%	0.7%	3.1%	0%		2.5%	**-**
Articulated Trucks	0	1	0	0		1	0	0	0	0		0	0	2	1	0		3	0	0	1	0		1	**-**
Articulated Trucks %	0%	0.4%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.7%	4.5%	0%		0.9%	0%	0%	0.4%	0%		0.2%	**-**
Pedestrians	-	-	-	-	6	-	-	-	-	-	3	-	-	-	-	-	11	-	-	-	-	-	12	-	**-**
Pedestrians%	-	-	-	-	17.1%		-	-	-	-	8.6%		-	-	-	-	31.4%		-	-	-	-	34.3%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	5.7%		-	-	-	-	2.9%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: ESSA RD & MAPLETON AVE
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

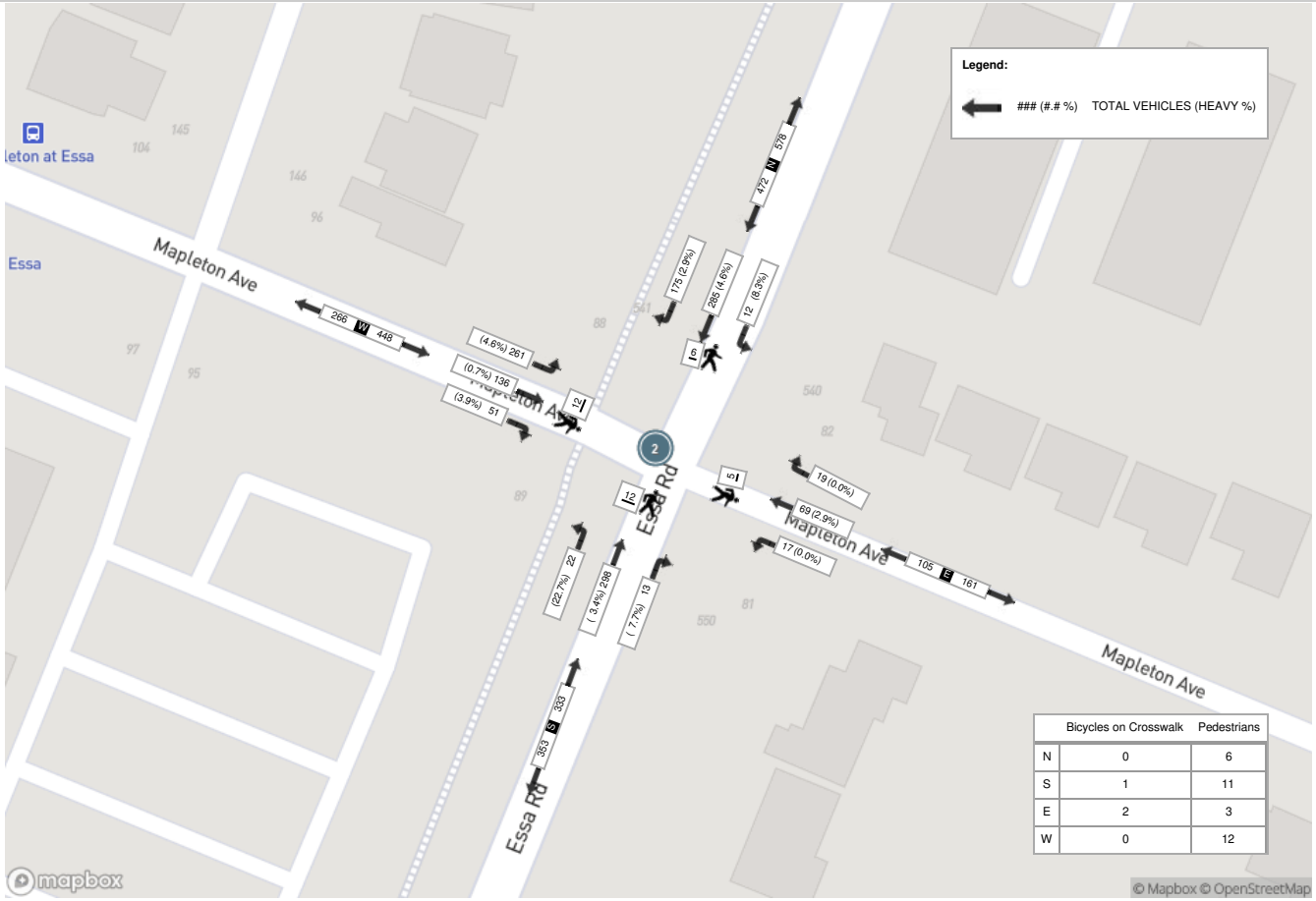
Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-1.06 °C)

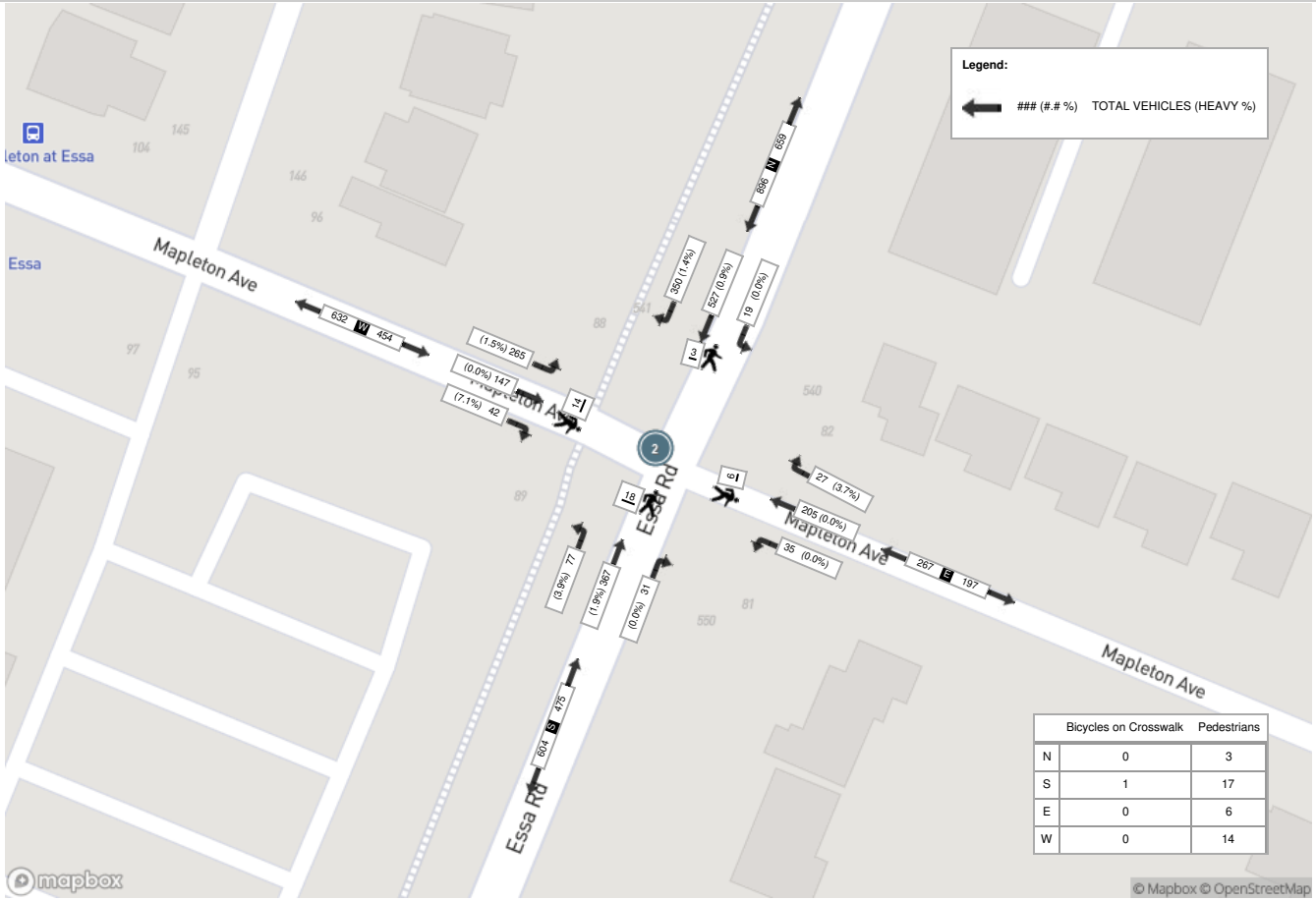
Start Time	N Approach ESSA RD						E Approach MAPLETON AVE						S Approach ESSA RD						W Approach MAPLETON AVE						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	86	120	3	0	0	209	5	45	9	0	1	59	9	93	14	0	3	116	8	38	67	0	0	113	497
16:45:00	87	139	8	0	0	234	6	56	13	0	2	75	4	77	24	0	5	105	16	45	53	0	5	114	528
17:00:00	71	123	5	0	1	199	5	55	5	0	1	65	8	83	22	0	3	113	11	30	69	0	4	110	487
17:15:00	106	145	3	0	2	254	11	49	8	0	2	68	10	114	17	0	7	141	7	34	76	0	5	117	580
Grand Total	350	527	19	0	3	896	27	205	35	0	6	267	31	367	77	0	18	475	42	147	265	0	14	454	**2092**
Approach%	39.1%	58.8%	2.1%	0%		-	10.1%	76.8%	13.1%	0%		-	6.5%	77.3%	16.2%	0%		-	9.3%	32.4%	58.4%	0%		-	**-**
Totals %	16.7%	25.2%	0.9%	0%		42.8%	1.3%	9.8%	1.7%	0%		12.8%	1.5%	17.5%	3.7%	0%		22.7%	2%	7%	12.7%	0%		21.7%	**-**
PHF	0.83	0.91	0.59	0		0.88	0.61	0.92	0.67	0		0.89	0.78	0.8	0.8	0		0.84	0.66	0.82	0.87	0		0.97	**-**
Heavy	5	5	0	0		10	1	0	0	0		1	0	7	3	0		10	3	0	4	0		7	**-**
Heavy %	1.4%	0.9%	0%	0%		1.1%	3.7%	0%	0%	0%		0.4%	0%	1.9%	3.9%	0%		2.1%	7.1%	0%	1.5%	0%		1.5%	**-**
Lights	345	522	19	0		886	26	205	35	0		266	31	360	74	0		465	39	147	261	0		447	**-**
Lights %	98.6%	99.1%	100%	0%		98.9%	96.3%	100%	100%	0%		99.6%	100%	98.1%	96.1%	0%		97.9%	92.9%	100%	98.5%	0%		98.5%	**-**
Single-Unit Trucks	2	5	0	0		7	1	0	0	0		1	0	6	1	0		7	1	0	1	0		2	**-**
Single-Unit Trucks %	0.6%	0.9%	0%	0%		0.8%	3.7%	0%	0%	0%		0.4%	0%	1.6%	1.3%	0%		1.5%	2.4%	0%	0.4%	0%		0.4%	**-**
Buses	2	0	0	0		2	0	0	0	0		0	0	1	2	0		3	2	0	3	0		5	**-**
Buses %	0.6%	0%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.3%	2.6%	0%		0.6%	4.8%	0%	1.1%	0%		1.1%	**-**
Articulated Trucks	1	0	0	0		1	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0.3%	0%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	3	-	-	-	-	-	6	-	-	-	-	-	17	-	-	-	-	-	14	-	**-**
Pedestrians%	-	-	-	-	7.3%		-	-	-	-	14.6%		-	-	-	-	41.5%		-	-	-	-	34.1%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	2.4%		-	-	-	-	0%		**-**

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 08:15 AM - 09:15 AM **Weather: Overcast Clouds (-3.26 °C)**



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-1.06 °C)



Spectrum

Turning Movement Count
Location Name: ESSA RD & HARVIE RD
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Turning Movement Count (3 . ESSA RD & HARVIE RD)

Start Time	N Approach ESSA RD						E Approach HARVIE RD						S Approach ESSA RD						W Approach HARVIE RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	2	46	0	0	0	48	0	4	15	0	0	19	27	51	1	0	0	79	2	12	2	0	0	16	162	
07:15:00	3	56	6	0	0	65	2	2	28	0	1	32	33	61	2	0	0	96	1	16	8	0	2	25	218	
07:30:00	1	77	2	0	1	80	2	2	21	0	0	25	65	74	0	0	0	139	4	18	4	0	0	26	270	
07:45:00	6	75	1	0	1	82	2	7	32	0	0	41	63	70	0	0	0	133	3	22	3	0	1	28	284	934
08:00:00	2	78	4	0	0	84	1	8	31	0	0	40	57	64	5	0	0	126	5	13	9	0	2	27	277	1049
08:15:00	1	83	7	0	0	91	1	9	22	0	1	32	60	97	2	0	0	159	3	12	8	0	0	23	305	1136
08:30:00	2	77	4	0	0	83	2	12	31	0	0	45	72	74	1	0	0	147	5	12	5	0	1	22	297	1163
08:45:00	3	94	5	0	0	102	4	8	34	0	0	46	50	95	0	0	0	145	3	21	7	0	1	31	324	1203
09:00:00	3	91	3	0	0	97	3	6	25	1	1	35	52	76	1	0	0	129	5	13	7	0	2	25	286	1212
09:15:00	6	85	2	0	0	93	6	8	26	0	0	40	31	74	1	1	0	107	4	6	11	0	1	21	261	1168
09:30:00	2	67	3	0	0	72	1	7	16	0	0	24	29	82	1	0	0	112	3	11	3	0	2	17	225	1096
09:45:00	9	85	1	0	0	95	4	11	18	0	1	33	36	66	3	0	0	105	0	11	3	0	1	14	247	1019
BREAK																										
15:00:00	5	105	5	0	0	115	8	17	41	0	0	66	47	87	1	0	0	135	1	10	5	0	1	16	332	
15:15:00	2	147	1	0	0	150	1	23	54	0	0	78	42	88	1	0	1	131	1	12	7	0	1	20	379	
15:30:00	3	146	10	0	0	159	8	21	44	0	0	73	73	118	1	0	0	192	3	13	2	0	3	18	442	
15:45:00	3	157	8	0	0	168	2	24	57	0	0	83	63	102	2	0	0	167	3	13	1	0	4	17	435	1588
16:00:00	6	145	7	0	0	158	13	25	50	0	0	88	50	119	7	0	0	176	2	11	8	0	0	21	443	1699
16:15:00	11	132	6	0	0	149	33	30	58	0	2	121	70	125	3	0	0	198	5	12	2	0	1	19	487	1807
16:30:00	17	139	8	0	0	164	9	36	61	0	0	106	62	104	2	0	0	168	5	14	1	0	0	20	458	1823
16:45:00	7	165	10	0	0	182	4	42	73	0	1	119	57	78	3	0	0	138	4	9	5	0	2	18	457	1845
17:00:00	15	137	12	0	0	164	8	27	58	0	0	93	58	100	3	0	0	161	3	12	7	0	0	22	440	1842
17:15:00	10	172	9	0	3	191	10	36	74	0	0	120	58	133	7	0	0	198	5	10	5	0	1	20	529	1884
17:30:00	14	135	4	0	0	153	3	31	59	0	1	93	44	103	2	0	0	149	3	9	9	0	1	21	416	1842
17:45:00	7	135	3	0	0	145	3	16	36	0	1	55	53	98	8	0	0	159	4	12	5	0	3	21	380	1765
Grand Total	140	2629	121	0	5	2890	130	412	964	1	9	1507	1252	2139	57	1	1	3449	77	304	127	0	30	508	**8354**	-
Approach%	4.8%	91%	4.2%	0%		-	8.6%	27.3%	64%	0.1%		-	36.3%	62%	1.7%	0%		-	15.2%	59.8%	25%	0%		-	**-**	-
Totals %	1.7%	31.5%	1.4%	0%		34.6%	1.6%	4.9%	11.5%	0%		18%	15%	25.6%	0.7%	0%		41.3%	0.9%	3.6%	1.5%	0%		6.1%	**-**	-
Heavy	1	54	6	0		-	4	4	18	0		-	25	60	2	0		-	1	3	2	0		-	**-**	-
Heavy %	0.7%	2.1%	5%	0%		-	3.1%	1%	1.9%	0%		-	2%	2.8%	3.5%	0%		-	1.3%	1%	1.6%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: ESSA RD & HARVIE RD
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (-3.26 °C)

Start Time	N Approach ESSA RD						E Approach HARVIE RD						S Approach ESSA RD						W Approach HARVIE RD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
08:15:00	1	83	7	0	0	91	1	9	22	0	1	32	60	97	2	0	0	159	3	12	8	0	0	23	305
08:30:00	2	77	4	0	0	83	2	12	31	0	0	45	72	74	1	0	0	147	5	12	5	0	1	22	297
08:45:00	3	94	5	0	0	102	4	8	34	0	0	46	50	95	0	0	0	145	3	21	7	0	1	31	324
09:00:00	3	91	3	0	0	97	3	6	25	1	1	35	52	76	1	0	0	129	5	13	7	0	2	25	286
Grand Total	9	345	19	0	0	373	10	35	112	1	2	158	234	342	4	0	0	580	16	58	27	0	4	101	**1212**
Approach%	2.4%	92.5%	5.1%	0%		-	6.3%	22.2%	70.9%	0.6%		-	40.3%	59%	0.7%	0%		-	15.8%	57.4%	26.7%	0%		-	**-**
Totals %	0.7%	28.5%	1.6%	0%		30.8%	0.8%	2.9%	9.2%	0.1%		13%	19.3%	28.2%	0.3%	0%		47.9%	1.3%	4.8%	2.2%	0%		8.3%	**-**
PHF	0.75	0.92	0.68	0		0.91	0.63	0.73	0.82	0.25		0.86	0.81	0.88	0.5	0		0.91	0.8	0.69	0.84	0		0.81	**-**
Heavy	0	10	0	0		10	1	1	7	0		9	5	17	0	0		22	1	0	1	0		2	**-**
Heavy %	0%	2.9%	0%	0%		2.7%	10%	2.9%	6.3%	0%		5.7%	2.1%	5%	0%	0%		3.8%	6.3%	0%	3.7%	0%		2%	**-**
Lights	9	335	19	0		363	9	34	105	1		149	229	325	4	0		558	15	58	26	0		99	**-**
Lights %	100%	97.1%	100%	0%		97.3%	90%	97.1%	93.8%	100%		94.3%	97.9%	95%	100%	0%		96.2%	93.8%	100%	96.3%	0%		98%	**-**
Single-Unit Trucks	0	3	0	0		3	0	1	6	0		7	1	6	0	0		7	0	0	0	0		0	**-**
Single-Unit Trucks %	0%	0.9%	0%	0%		0.8%	0%	2.9%	5.4%	0%		4.4%	0.4%	1.8%	0%	0%		1.2%	0%	0%	0%	0%		0%	**-**
Buses	0	6	0	0		6	1	0	1	0		2	4	8	0	0		12	1	0	1	0		2	**-**
Buses %	0%	1.7%	0%	0%		1.6%	10%	0%	0.9%	0%		1.3%	1.7%	2.3%	0%	0%		2.1%	6.3%	0%	3.7%	0%		2%	**-**
Articulated Trucks	0	1	0	0		1	0	0	0	0		0	0	3	0	0		3	0	0	0	0		0	**-**
Articulated Trucks %	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.5%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	4	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	33.3%		-	-	-	-	0%		-	-	-	-	66.7%		**-**

Spectrum

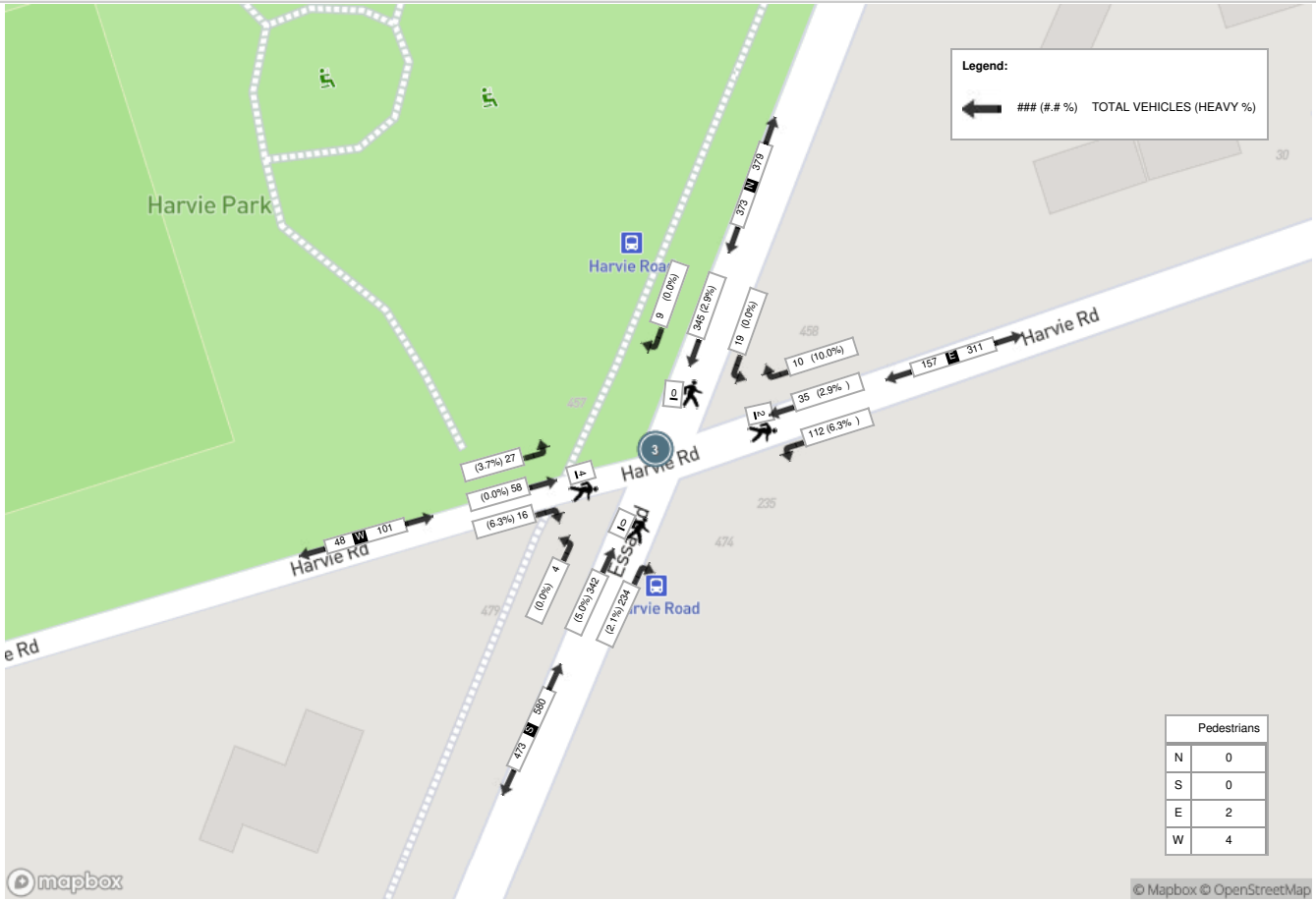
Turning Movement Count
Location Name: ESSA RD & HARVIE RD
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

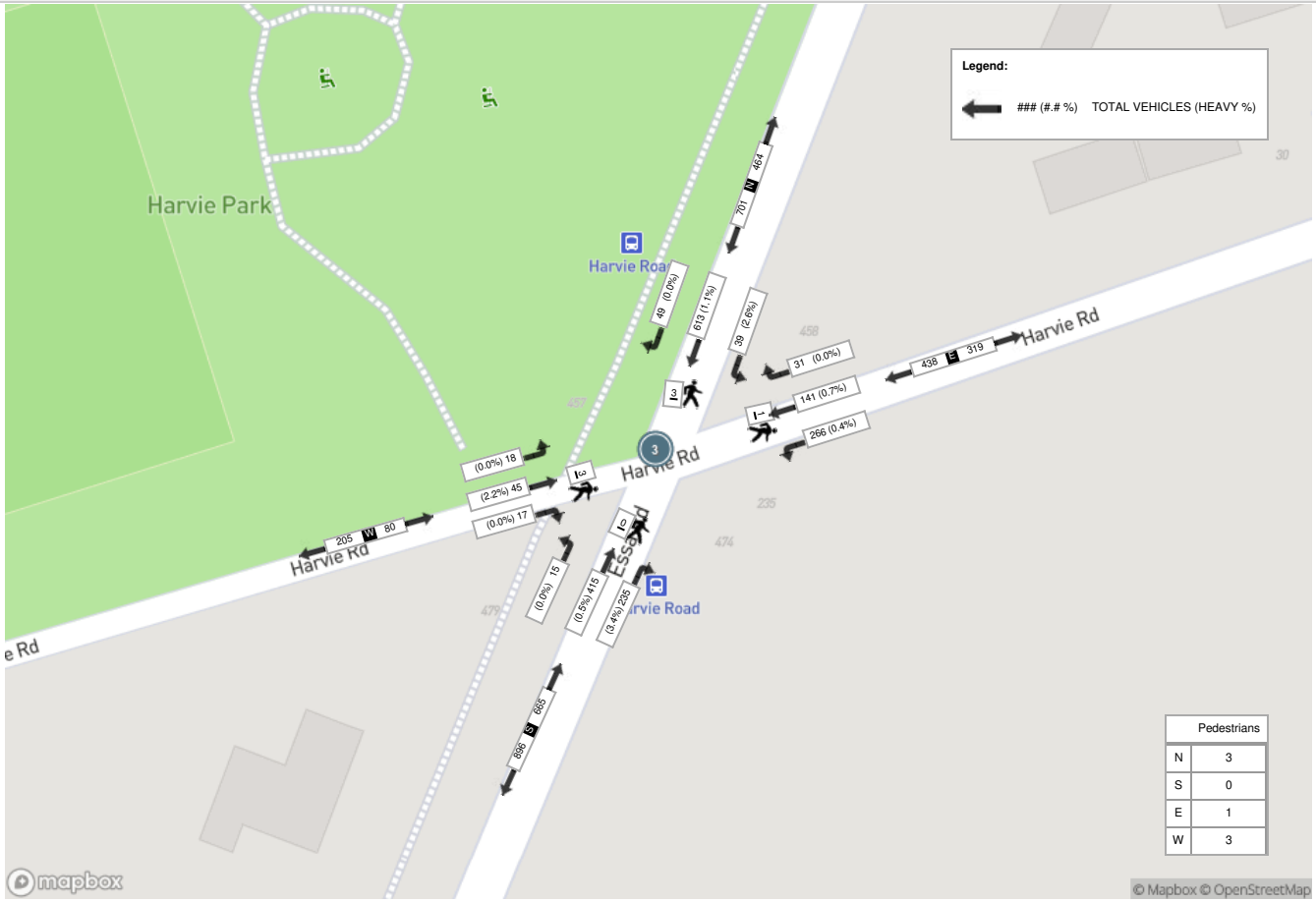
Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-1.06 °C)

Start Time	N Approach ESSA RD						E Approach HARVIE RD						S Approach ESSA RD						W Approach HARVIE RD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	17	139	8	0	0	164	9	36	61	0	0	106	62	104	2	0	0	168	5	14	1	0	0	20	458
16:45:00	7	165	10	0	0	182	4	42	73	0	1	119	57	78	3	0	0	138	4	9	5	0	2	18	457
17:00:00	15	137	12	0	0	164	8	27	58	0	0	93	58	100	3	0	0	161	3	12	7	0	0	22	440
17:15:00	10	172	9	0	3	191	10	36	74	0	0	120	58	133	7	0	0	198	5	10	5	0	1	20	529
Grand Total	49	613	39	0	3	701	31	141	266	0	1	438	235	415	15	0	0	665	17	45	18	0	3	80	**1884**
Approach%	7%	87.4%	5.6%	0%		-	7.1%	32.2%	60.7%	0%		-	35.3%	62.4%	2.3%	0%		-	21.3%	56.3%	22.5%	0%		-	**-**
Totals %	2.6%	32.5%	2.1%	0%		37.2%	1.6%	7.5%	14.1%	0%		23.2%	12.5%	22%	0.8%	0%		35.3%	0.9%	2.4%	1%	0%		4.2%	**-**
PHF	0.72	0.89	0.81	0		0.92	0.78	0.84	0.9	0		0.91	0.95	0.78	0.54	0		0.84	0.85	0.8	0.64	0		0.91	**-**
Heavy	0	7	1	0		8	0	1	1	0		2	8	2	0	0		10	0	1	0	0		1	**-**
Heavy %	0%	1.1%	2.6%	0%		1.1%	0%	0.7%	0.4%	0%		0.5%	3.4%	0.5%	0%	0%		1.5%	0%	2.2%	0%	0%		1.3%	**-**
Lights	49	606	38	0		693	31	140	265	0		436	227	413	15	0		655	17	44	18	0		79	**-**
Lights %	100%	98.9%	97.4%	0%		98.9%	100%	99.3%	99.6%	0%		99.5%	96.6%	99.5%	100%	0%		98.5%	100%	97.8%	100%	0%		98.8%	**-**
Single-Unit Trucks	0	5	1	0		6	0	1	0	0		1	6	0	0	0		6	0	1	0	0		1	**-**
Single-Unit Trucks %	0%	0.8%	2.6%	0%		0.9%	0%	0.7%	0%	0%		0.2%	2.6%	0%	0%	0%		0.9%	0%	2.2%	0%	0%		1.3%	**-**
Buses	0	2	0	0		2	0	0	0	0		0	2	1	0	0		3	0	0	0	0		0	**-**
Buses %	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0.9%	0.2%	0%	0%		0.5%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	0	1	0		1	0	1	0	0		1	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0.4%	0%		0.2%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	3	-	**-**
Pedestrians%	-	-	-	-	42.9%		-	-	-	-	14.3%		-	-	-	-	0%		-	-	-	-	42.9%		**-**

Peak Hour: 08:15 AM - 09:15 AM **Weather: Overcast Clouds (-3.26 °C)**



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-1.06 °C)



Spectrum

Turning Movement Count
Location Name: ESSA RD & FERNDALE DR / VETERANS DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Turning Movement Count (4 . ESSA RD & FERNDALE DR / VETERANS DR)

Start Time	N Approach ESSA RD						E Approach VETERANS DR						S Approach ESSA RD						W Approach FERNDALE DR						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	5	35	42	0	2	82	13	29	1	0	4	43	2	48	7	0	5	57	8	72	4	0	0	84	266	
07:15:00	6	46	48	0	0	100	13	52	1	0	1	66	0	53	19	0	0	72	22	101	11	0	1	134	372	
07:30:00	12	64	35	0	1	111	14	39	2	0	0	55	2	53	25	0	0	80	19	134	9	0	0	162	408	
07:45:00	5	59	67	1	0	132	24	80	2	0	1	106	3	50	21	0	2	74	31	207	18	0	3	256	568	1614
08:00:00	6	50	61	0	5	117	19	85	8	0	0	112	3	53	21	0	0	77	21	145	21	0	0	187	493	1841
08:15:00	14	67	80	0	0	161	19	70	4	0	2	93	5	77	27	0	0	109	21	127	7	0	0	155	518	1987
08:30:00	2	64	87	0	4	153	44	73	4	0	1	121	2	61	23	0	0	86	17	113	10	0	1	140	500	2079
08:45:00	5	76	89	0	2	170	36	75	4	0	0	115	1	69	38	0	0	108	19	142	21	0	1	182	575	2086
09:00:00	10	67	52	0	0	129	29	76	4	1	0	110	0	65	21	0	0	86	34	164	23	0	2	221	546	2139
09:15:00	5	55	75	0	0	135	29	59	12	0	1	100	7	64	18	0	2	89	31	146	20	0	2	197	521	2142
09:30:00	3	45	64	0	3	112	30	70	4	0	0	104	2	62	20	0	2	84	23	100	16	0	3	139	439	2081
09:45:00	5	64	65	0	1	134	23	75	3	0	0	101	3	57	18	0	0	78	30	117	16	0	3	163	476	1982
BREAK																										
15:00:00	6	82	73	0	6	161	61	134	4	0	1	199	5	50	44	0	1	99	32	87	16	0	1	135	594	
15:15:00	20	125	73	0	14	218	58	173	6	0	5	237	1	77	27	0	0	105	25	98	7	0	0	130	690	
15:30:00	21	120	82	0	3	223	49	169	8	0	0	226	6	67	56	0	0	129	25	121	13	0	5	159	737	
15:45:00	15	122	88	0	5	225	44	143	7	0	0	194	1	55	46	0	0	102	45	148	23	0	6	216	737	2758
16:00:00	20	121	85	0	2	226	47	147	6	0	1	200	7	68	61	0	0	136	37	130	15	0	0	182	744	2908
16:15:00	17	115	85	0	0	217	35	182	7	0	0	224	4	94	59	0	1	157	28	115	14	0	1	157	755	2973
16:30:00	17	137	83	0	1	237	49	235	7	0	6	291	2	69	47	0	1	118	35	121	12	0	0	168	814	3050
16:45:00	23	122	79	0	6	224	57	232	8	0	1	297	8	50	36	0	1	94	46	119	10	0	1	175	790	3103
17:00:00	26	126	77	0	3	229	55	232	9	0	1	296	3	61	47	0	0	111	42	132	21	0	2	195	831	3190
17:15:00	17	157	85	0	2	259	38	236	7	0	5	281	4	87	57	0	0	148	33	140	18	0	1	191	879	3314
17:30:00	18	125	85	0	5	228	50	196	7	0	0	253	1	71	44	0	0	116	27	102	17	0	4	146	743	3243
17:45:00	17	118	71	1	2	207	50	158	7	0	2	215	3	52	46	0	0	101	22	96	14	0	3	132	655	3108
Grand Total	295	2162	1731	2	67	4190	886	3020	132	1	32	4039	75	1513	828	0	15	2416	673	2977	356	0	40	4006	**14651**	-
Approach%	7%	51.6%	41.3%	0%		-	21.9%	74.8%	3.3%	0%		-	3.1%	62.6%	34.3%	0%		-	16.8%	74.3%	8.9%	0%		-	**-**	-
Totals %	2%	14.8%	11.8%	0%		28.6%	6%	20.6%	0.9%	0%		27.6%	0.5%	10.3%	5.7%	0%		16.5%	4.6%	20.3%	2.4%	0%		27.3%	**-**	-
Heavy	8	50	47	0		-	26	77	1	0		-	2	43	19	0		-	14	85	4	0		-	**-**	-
Heavy %	2.7%	2.3%	2.7%	0%		-	2.9%	2.5%	0.8%	0%		-	2.7%	2.8%	2.3%	0%		-	2.1%	2.9%	1.1%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: ESSA RD & FERNDALE DR / VETERANS DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 08:30 AM - 09:30 AM Weather: Overcast Clouds (-3.26 °C)

Start Time	N Approach ESSA RD						E Approach VETERANS DR						S Approach ESSA RD						W Approach FERNDALE DR						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
08:30:00	2	64	87	0	4	153	44	73	4	0	1	121	2	61	23	0	0	86	17	113	10	0	1	140	500
08:45:00	5	76	89	0	2	170	36	75	4	0	0	115	1	69	38	0	0	108	19	142	21	0	1	182	575
09:00:00	10	67	52	0	0	129	29	76	4	1	0	110	0	65	21	0	0	86	34	164	23	0	2	221	546
09:15:00	5	55	75	0	0	135	29	59	12	0	1	100	7	64	18	0	2	89	31	146	20	0	2	197	521
Grand Total	22	262	303	0	6	587	138	283	24	1	2	446	10	259	100	0	2	369	101	565	74	0	6	740	**2142**
Approach%	3.7%	44.6%	51.6%	0%		-	30.9%	63.5%	5.4%	0.2%		-	2.7%	70.2%	27.1%	0%		-	13.6%	76.4%	10%	0%		-	**-**
Totals %	1%	12.2%	14.1%	0%		27.4%	6.4%	13.2%	1.1%	0%		20.8%	0.5%	12.1%	4.7%	0%		17.2%	4.7%	26.4%	3.5%	0%		34.5%	**-**
PHF	0.55	0.86	0.85	0		0.86	0.78	0.93	0.5	0.25		0.92	0.36	0.94	0.66	0		0.85	0.74	0.86	0.8	0		0.84	**-**
Heavy	2	8	11	0		21	9	20	0	0		29	1	13	6	0		20	2	16	1	0		19	**-**
Heavy %	9.1%	3.1%	3.6%	0%		3.6%	6.5%	7.1%	0%	0%		6.5%	10%	5%	6%	0%		5.4%	2%	2.8%	1.4%	0%		2.6%	**-**
Lights	20	254	292	0		566	129	263	24	1		417	9	246	94	0		349	99	549	73	0		721	**-**
Lights %	90.9%	96.9%	96.4%	0%		96.4%	93.5%	92.9%	100%	100%		93.5%	90%	95%	94%	0%		94.6%	98%	97.2%	98.6%	0%		97.4%	**-**
Single-Unit Trucks	0	4	5	0		9	7	16	0	0		23	0	4	3	0		7	1	10	0	0		11	**-**
Single-Unit Trucks %	0%	1.5%	1.7%	0%		1.5%	5.1%	5.7%	0%	0%		5.2%	0%	1.5%	3%	0%		1.9%	1%	1.8%	0%	0%		1.5%	**-**
Buses	2	3	3	0		8	1	4	0	0		5	1	7	3	0		11	1	6	1	0		8	**-**
Buses %	9.1%	1.1%	1%	0%		1.4%	0.7%	1.4%	0%	0%		1.1%	10%	2.7%	3%	0%		3%	1%	1.1%	1.4%	0%		1.1%	**-**
Articulated Trucks	0	1	3	0		4	1	0	0	0		1	0	2	0	0		2	0	0	0	0		0	**-**
Articulated Trucks %	0%	0.4%	1%	0%		0.7%	0.7%	0%	0%	0%		0.2%	0%	0.8%	0%	0%		0.5%	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%	**-**
Pedestrians	-	-	-	-	6	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	6	-	**-**
Pedestrians%	-	-	-	-	37.5%		-	-	-	-	12.5%		-	-	-	-	12.5%		-	-	-	-	37.5%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

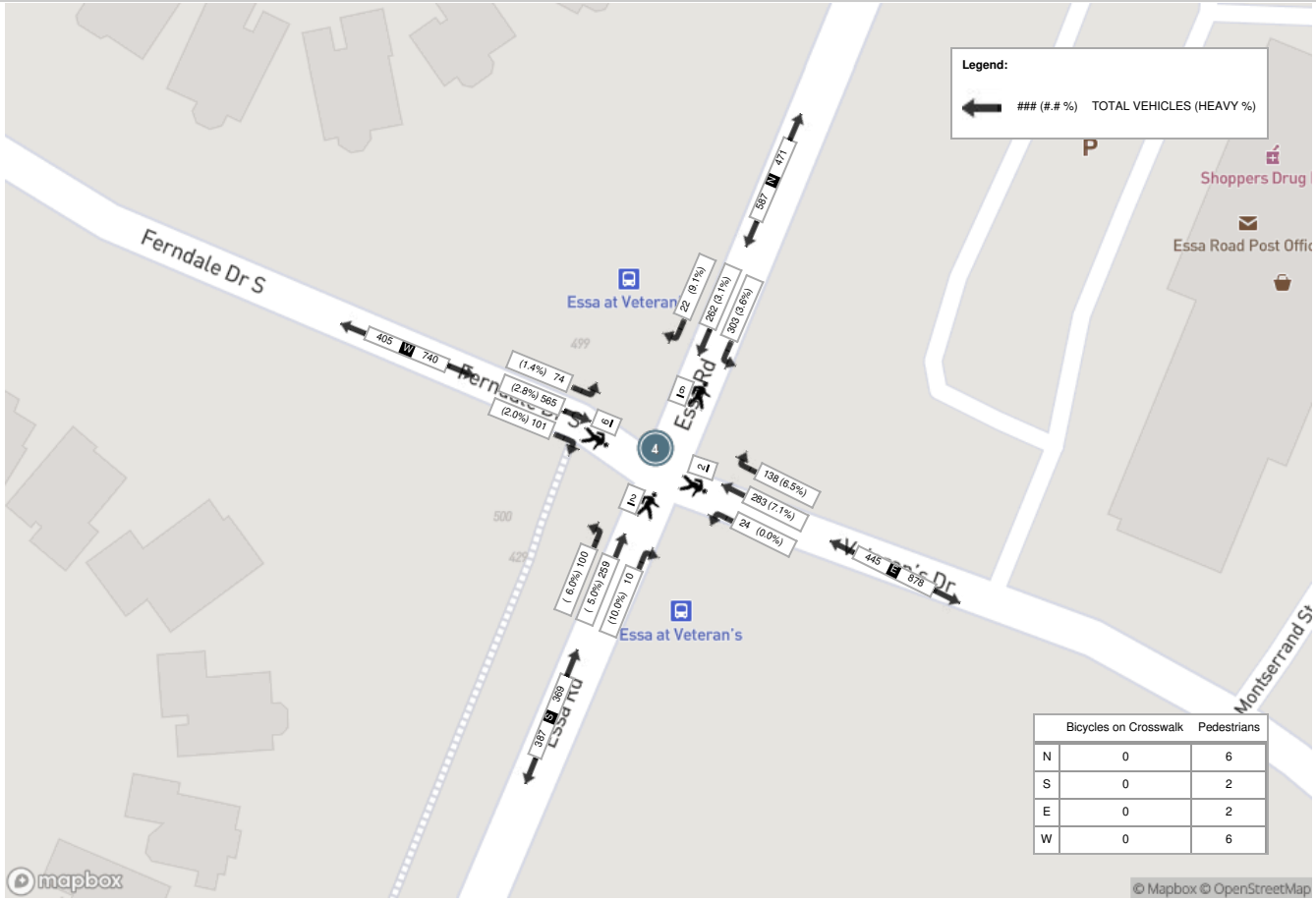
Turning Movement Count
Location Name: ESSA RD & FERNDALE DR / VETERANS DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-1.06 °C)

Start Time	N Approach ESSA RD						E Approach VETERANS DR						S Approach ESSA RD						W Approach FERNDALE DR						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	17	137	83	0	1	237	49	235	7	0	6	291	2	69	47	0	1	118	35	121	12	0	0	168	814
16:45:00	23	122	79	0	6	224	57	232	8	0	1	297	8	50	36	0	1	94	46	119	10	0	1	175	790
17:00:00	26	126	77	0	3	229	55	232	9	0	1	296	3	61	47	0	0	111	42	132	21	0	2	195	831
17:15:00	17	157	85	0	2	259	38	236	7	0	5	281	4	87	57	0	0	148	33	140	18	0	1	191	879
Grand Total	83	542	324	0	12	949	199	935	31	0	13	1165	17	267	187	0	2	471	156	512	61	0	4	729	**3314**
Approach%	8.7%	57.1%	34.1%	0%		-	17.1%	80.3%	2.7%	0%		-	3.6%	56.7%	39.7%	0%		-	21.4%	70.2%	8.4%	0%		-	**-**
Totals %	2.5%	16.4%	9.8%	0%		28.6%	6%	28.2%	0.9%	0%		35.2%	0.5%	8.1%	5.6%	0%		14.2%	4.7%	15.4%	1.8%	0%		22%	**-**
PHF	0.8	0.86	0.95	0		0.92	0.87	0.99	0.86	0		0.98	0.53	0.77	0.82	0		0.8	0.85	0.91	0.73	0		0.93	**-**
Heavy	2	6	7	0		15	2	7	0	0		9	0	2	0	0		2	4	10	1	0		15	**-**
Heavy %	2.4%	1.1%	2.2%	0%		1.6%	1%	0.7%	0%	0%		0.8%	0%	0.7%	0%	0%		0.4%	2.6%	2%	1.6%	0%		2.1%	**-**
Lights	81	536	317	0		934	197	928	31	0		1156	17	265	187	0		469	152	502	60	0		714	**-**
Lights %	97.6%	98.9%	97.8%	0%		98.4%	99%	99.3%	100%	0%		99.2%	100%	99.3%	100%	0%		99.6%	97.4%	98%	98.4%	0%		97.9%	**-**
Single-Unit Trucks	2	4	3	0		9	1	4	0	0		5	0	1	0	0		1	4	7	0	0		11	**-**
Single-Unit Trucks %	2.4%	0.7%	0.9%	0%		0.9%	0.5%	0.4%	0%	0%		0.4%	0%	0.4%	0%	0%		0.2%	2.6%	1.4%	0%	0%		1.5%	**-**
Buses	0	2	0	0		2	0	2	0	0		2	0	1	0	0		1	0	3	0	0		3	**-**
Buses %	0%	0.4%	0%	0%		0.2%	0%	0.2%	0%	0%		0.2%	0%	0.4%	0%	0%		0.2%	0%	0.6%	0%	0%		0.4%	**-**
Articulated Trucks	0	0	4	0		4	1	1	0	0		2	0	0	0	0		0	0	0	1	0		1	**-**
Articulated Trucks %	0%	0%	1.2%	0%		0.4%	0.5%	0.1%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0%	1.6%	0%		0.1%	**-**
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%	**-**
Pedestrians	-	-	-	-	12	-	-	-	-	-	13	-	-	-	-	-	2	-	-	-	-	-	3	-	**-**
Pedestrians%	-	-	-	-	38.7%		-	-	-	-	41.9%		-	-	-	-	6.5%		-	-	-	-	9.7%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	3.2%		**-**

Peak Hour: 08:30 AM - 09:30 AM **Weather: Overcast Clouds (-3.26 °C)**



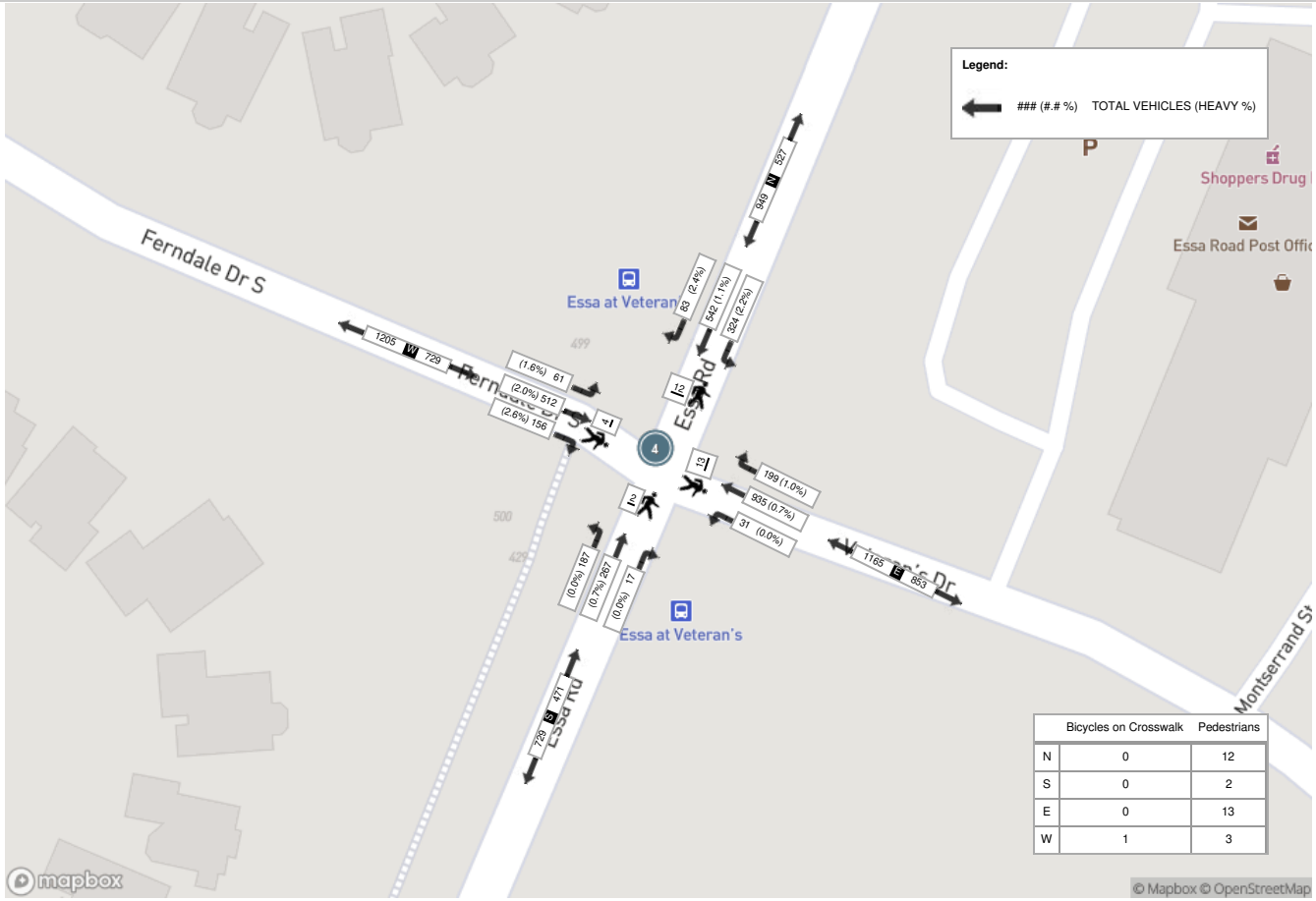
	Bicycles on Crosswalk	Pedestrians
N	0	6
S	0	2
E	0	2
W	0	6

Spectrum

Turning Movement Count
Location Name: ESSA RD & FERNDALE DR / VETERANS DR
Date: Tue, Nov 15, 2022 Deployment Lead: Peter Ilias

Tatham Engineering
UNIT 4 41 KING STREET
BARRIE ONTARIO, L4N 6B5
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-1.06 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	12
S	0	2
E	0	13
W	1	3

Appendix B:
Level of Service Definitions

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CAPACITY ANALYSIS AT UNSIGNALIZED INTERSECTIONS

Highway Capacity Manual Methodology

The level of service at an unsignalized intersection is determined on the basis of control delay for each critical lane. This method of analysis is taken from the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 1997.

The average control delay for any particular critical movement (control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay) is a function of the service rate or capacity of the approach and degree of saturation. The level of service criteria for unsignalized intersections is outlined below and is related to ranges in vehicle delay.

Level of Service	Expected Delay to Minor Street Traffic	Average Control Delay 'd' (sec/veh)
A	Little or no delays	$0 < d \leq 10$
B	Short traffic delays	$10 \leq d \leq 15$
C	Average traffic delays	$15 \leq d \leq 25$
D	Long traffic delays	$25 \leq d \leq 35$
E	Very long traffic delays	$35 \leq d \leq 50$
F	Extreme delays with queuing which may cause congestion affecting other traffic movements in the intersection	$d > 50$

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CAPACITY ANALYSIS AT SIGNALIZED INTERSECTIONS

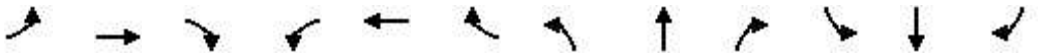
Highway Capacity Manual Methodology

The capacity of signalized intersections has been determined in terms of delay taken from Chapter 9 of the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 2000.

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". Level of Service (LOS) for signalized intersections is defined in terms of delay, which is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Only the portion of total delay attributed to the control facility is quantified. This control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay. The following table describes in detail the characteristics of each level:

Level of Service	Expected Delay to Minor Street Traffic	Average Control Delay 'd' (sec/veh)
A	Describes operations with very low control delay, up to 10 seconds/vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all at this LOS. Short cycle lengths may also contribute to low delay.	$d \leq 10$
B	Describes operations with control delay greater than 10 seconds and up to 20 seconds/vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop at this level than at LOS A, causing longer average delays.	$10 \leq d \leq 20$
C	Describes operations with control delay greater than 20 seconds and up to 35 seconds/vehicle. These higher delays may result from fair progression, longer cycle length, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.	$20 \leq d \leq 35$
D	Describes operations with control delay greater than 35 seconds and up to 55 seconds/vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures become noticeable.	$35 \leq d \leq 55$
E	Describes operations with control delay greater than 55 seconds and up to 80 seconds/vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	$55 \leq d \leq 80$
F	**LOS F** describes operations with control delay in excess of 80 seconds/vehicle. This *oversaturation*, considered to be unacceptable to most drivers, occurs when arrival flow rates exceed the design capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such high delay levels.	$d > 80$

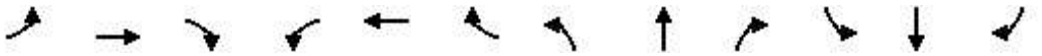
Appendix C:
Existing Operations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	713	32	85	259	58	42	158	147	104	180	114
Future Volume (vph)	136	713	32	85	259	58	42	158	147	104	180	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3477		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.51	1.00		0.18	1.00	1.00	0.63	1.00	1.00	0.57	1.00	1.00
Satd. Flow (perm)	948	3477		332	3500	1566	1167	1842	1566	1055	1842	1566
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	149	784	35	93	285	64	46	174	162	114	198	125
RTOR Reduction (vph)	0	3	0	0	0	47	0	0	108	0	0	69
Lane Group Flow (vph)	149	816	0	93	285	17	46	174	54	114	198	56
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	37.0	27.6		31.4	24.8	24.8	30.8	30.8	30.8	41.7	41.7	41.7
Effective Green, g (s)	37.0	27.6		31.4	24.8	24.8	30.8	30.8	30.8	41.7	41.7	41.7
Actuated g/C Ratio	0.40	0.30		0.34	0.27	0.27	0.33	0.33	0.33	0.45	0.45	0.45
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	458	1032		212	934	418	386	610	519	525	826	702
v/s Ratio Prot	c0.03	c0.23		c0.03	0.08			c0.09		0.02	c0.11	
v/s Ratio Perm	0.10			0.12		0.01	0.04		0.03	0.08		0.04
v/c Ratio	0.33	0.79		0.44	0.31	0.04	0.12	0.29	0.10	0.22	0.24	0.08
Uniform Delay, d1	18.4	30.0		22.4	27.2	25.2	21.6	22.9	21.5	15.2	15.8	14.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	4.2		1.5	0.2	0.0	0.6	1.2	0.4	0.2	0.7	0.2
Delay (s)	18.9	34.2		23.8	27.4	25.3	22.2	24.1	21.9	15.4	16.5	14.9
Level of Service	B	C		C	C	C	C	C	C	B	B	B
Approach Delay (s)		31.8			26.3			22.9			15.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	92.9	Sum of lost time (s)	21.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		

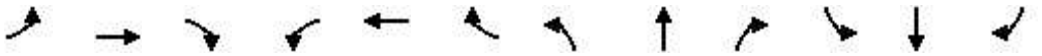
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	928	35	14	411	1	3	0	12	1	0	1
Future Volume (vph)	1	928	35	14	411	1	3	0	12	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	5001		1750	5027		1750	1566		3395	1566	
Flt Permitted	0.48	1.00		0.25	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)	882	5001		465	5027		1842	1566		3574	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	1031	39	16	457	1	3	0	13	1	0	1
RTOR Reduction (vph)	0	2	0	0	0	0	0	13	0	0	1	0
Lane Group Flow (vph)	1	1068	0	16	458	0	3	0	0	1	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Effective Green, g (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Actuated g/C Ratio	0.74	0.73		0.74	0.73		0.04	0.02		0.02	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	666	3653		361	3672		65	28		86	19	
v/s Ratio Prot	0.00	c0.21		c0.00	0.09		c0.00	0.00		0.00	0.00	
v/s Ratio Perm	0.00			0.03			c0.00			0.00		
v/c Ratio	0.00	0.29		0.04	0.12		0.05	0.01		0.01	0.00	
Uniform Delay, d1	2.9	4.1		2.9	3.5		41.1	42.6		42.0	43.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.2		0.1	0.1		0.3	0.1		0.1	0.0	
Delay (s)	2.9	4.3		3.0	3.6		41.4	42.7		42.1	43.1	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		4.3			3.6			42.4			42.6	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

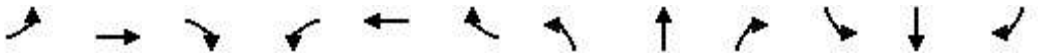
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	726	97	194	425	133	61	162	120	259	357	40
Future Volume (vph)	64	726	97	194	425	133	61	162	120	259	357	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4940		1750	4849		1750	3276		1750	3447	
Flt Permitted	0.43	1.00		0.27	1.00		0.44	1.00		0.50	1.00	
Satd. Flow (perm)	783	4940		503	4849		819	3276		922	3447	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	66	748	100	200	438	137	63	167	124	267	368	41
RTOR Reduction (vph)	0	15	0	0	50	0	0	102	0	0	10	0
Lane Group Flow (vph)	66	833	0	200	525	0	63	189	0	267	399	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.4	37.9		46.4	39.4		21.2	15.7		24.2	17.2	
Effective Green, g (s)	43.4	37.9		46.4	39.4		21.2	15.7		24.2	17.2	
Actuated g/C Ratio	0.50	0.43		0.53	0.45		0.24	0.18		0.28	0.20	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	448	2137		366	2180		256	587		320	676	
v/s Ratio Prot	0.01	0.17		c0.04	0.11		0.02	0.06		c0.07	0.12	
v/s Ratio Perm	0.06			c0.25			0.04			c0.16		
v/c Ratio	0.15	0.39		0.55	0.24		0.25	0.32		0.83	0.59	
Uniform Delay, d1	11.6	17.0		11.2	14.9		26.1	31.3		28.5	32.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.5		1.7	0.3		0.5	0.3		16.8	1.4	
Delay (s)	11.7	17.5		12.9	15.1		26.6	31.6		45.3	33.4	
Level of Service	B	B		B	B		C	C		D	C	
Approach Delay (s)		17.1			14.6			30.7			38.1	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	87.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

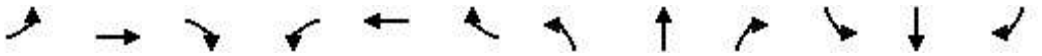
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	261	136	51	17	69	19	22	298	13	12	285	175
Future Volume (vph)	261	136	51	17	69	19	22	298	13	12	285	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1783		1750	3477		1750	3300	
Flt Permitted	0.47	1.00		0.63	1.00		0.44	1.00		0.55	1.00	
Satd. Flow (perm)	873	1766		1168	1783		819	3477		1020	3300	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	275	143	54	18	73	20	23	314	14	13	300	184
RTOR Reduction (vph)	0	14	0	0	10	0	0	3	0	0	71	0
Lane Group Flow (vph)	275	183	0	18	83	0	23	325	0	13	413	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	28.9	28.9		8.5	8.5		47.5	45.1		45.1	43.9	
Effective Green, g (s)	28.9	28.9		8.5	8.5		47.5	45.1		45.1	43.9	
Actuated g/C Ratio	0.32	0.32		0.09	0.09		0.52	0.49		0.49	0.48	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	434	559		108	166		451	1719		514	1588	
v/s Ratio Prot	c0.11	0.10			0.05		c0.00	0.09		0.00	c0.13	
v/s Ratio Perm	c0.09			0.02			0.03			0.01		
v/c Ratio	0.63	0.33		0.17	0.50		0.05	0.19		0.03	0.26	
Uniform Delay, d1	25.4	23.7		38.1	39.3		10.7	12.9		11.7	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.3		0.7	2.4		0.0	0.2		0.0	0.4	
Delay (s)	28.4	24.1		38.8	41.7		10.7	13.1		11.8	14.4	
Level of Service	C	C		D	D		B	B		B	B	
Approach Delay (s)		26.6			41.2			12.9			14.3	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

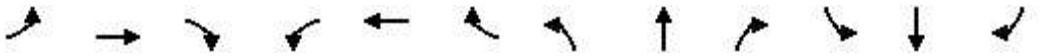
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	58	16	112	35	10	4	342	234	19	345	9
Future Volume (vph)	27	58	16	112	35	10	4	342	234	19	345	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1783		1750	1779		1750	3287		1750	3486	
Flt Permitted	0.73	1.00		0.71	1.00		0.53	1.00		0.40	1.00	
Satd. Flow (perm)	1337	1783		1300	1779		973	3287		744	3486	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	29	62	17	119	37	11	4	364	249	20	367	10
RTOR Reduction (vph)	0	9	0	0	9	0	0	84	0	0	1	0
Lane Group Flow (vph)	29	70	0	119	39	0	4	529	0	20	376	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.3	14.3		14.3	14.3		65.5	64.3		68.1	65.6	
Effective Green, g (s)	14.3	14.3		14.3	14.3		65.5	64.3		68.1	65.6	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.67	0.66		0.70	0.68	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	196	262		191	261		665	2176		547	2355	
v/s Ratio Prot		0.04			0.02		0.00	c0.16		c0.00	0.11	
v/s Ratio Perm	0.02			c0.09			0.00			0.02		
v/c Ratio	0.15	0.27		0.62	0.15		0.01	0.24		0.04	0.16	
Uniform Delay, d1	36.1	36.7		38.9	36.1		5.2	6.6		4.4	5.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.5		6.2	0.3		0.0	0.3		0.0	0.1	
Delay (s)	36.4	37.3		45.1	36.4		5.2	6.9		4.4	5.9	
Level of Service	D	D		D	D		A	A		A	A	
Approach Delay (s)		37.1			42.6			6.9			5.8	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

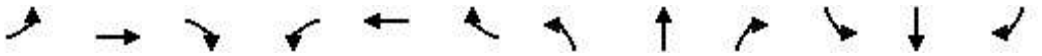
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	565	101	24	283	138	100	259	10	303	262	22
Future Volume (vph)	74	565	101	24	283	138	100	259	10	303	262	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3420		1750	3328		1750	3480		1750	3459	
Flt Permitted	0.33	1.00		0.17	1.00		0.57	1.00		0.53	1.00	
Satd. Flow (perm)	606	3420		319	3328		1042	3480		981	3459	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	80	608	109	26	304	148	108	278	11	326	282	24
RTOR Reduction (vph)	0	13	0	0	55	0	0	2	0	0	6	0
Lane Group Flow (vph)	80	704	0	26	397	0	108	287	0	326	300	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	30.1	24.6		27.1	23.1		53.6	46.6		61.0	50.3	
Effective Green, g (s)	30.1	24.6		27.1	23.1		53.6	46.6		61.0	50.3	
Actuated g/C Ratio	0.28	0.23		0.26	0.22		0.51	0.44		0.58	0.47	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	231	794		135	725		574	1531		642	1642	
v/s Ratio Prot	c0.02	c0.21		0.01	0.12		0.01	0.08		c0.05	0.09	
v/s Ratio Perm	0.08			0.04			0.08			c0.24		
v/c Ratio	0.35	0.89		0.19	0.55		0.19	0.19		0.51	0.18	
Uniform Delay, d1	28.8	39.3		30.7	36.8		13.8	18.1		11.8	16.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	11.7		0.7	0.9		0.2	0.3		0.6	0.2	
Delay (s)	29.7	51.0		31.4	37.6		13.9	18.4		12.4	16.2	
Level of Service	C	D		C	D		B	B		B	B	
Approach Delay (s)		48.8			37.3			17.2			14.3	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	105.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

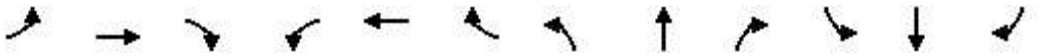
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	443	22	197	894	248	59	253	143	97	246	218
Future Volume (vph)	112	443	22	197	894	248	59	253	143	97	246	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3475		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.15	1.00		0.35	1.00	1.00	0.60	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	276	3475		653	3500	1566	1109	1842	1566	853	1842	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	115	457	23	203	922	256	61	261	147	100	254	225
RTOR Reduction (vph)	0	4	0	0	0	177	0	0	95	0	0	127
Lane Group Flow (vph)	115	476	0	203	922	79	61	261	52	100	254	98
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	33.9	26.7		38.7	29.1	29.1	30.8	30.8	30.8	41.5	41.5	41.5
Effective Green, g (s)	33.9	26.7		38.7	29.1	29.1	30.8	30.8	30.8	41.5	41.5	41.5
Actuated g/C Ratio	0.36	0.28		0.41	0.31	0.31	0.32	0.32	0.32	0.44	0.44	0.44
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	210	978		377	1074	480	360	598	508	436	806	685
v/s Ratio Prot	0.04	0.14		c0.05	c0.26			c0.14		0.02	c0.14	
v/s Ratio Perm	0.15			0.17		0.05	0.06		0.03	0.08		0.06
v/c Ratio	0.55	0.49		0.54	0.86	0.16	0.17	0.44	0.10	0.23	0.32	0.14
Uniform Delay, d1	22.5	28.3		19.2	30.9	24.0	22.9	25.2	22.3	16.2	17.4	16.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.4		1.5	7.0	0.2	1.0	2.3	0.4	0.3	1.0	0.4
Delay (s)	25.4	28.7		20.6	37.9	24.1	23.9	27.5	22.7	16.5	18.4	16.4
Level of Service	C	C		C	D	C	C	C	C	B	B	B
Approach Delay (s)		28.1			32.8			25.5			17.3	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	21.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		

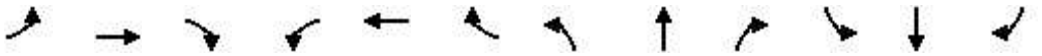
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	666	33	3	1283	6	62	0	14	2	0	2
Future Volume (vph)	2	666	33	3	1283	6	62	0	14	2	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4993		1750	5025		1750	1566		3395	1566	
Flt Permitted	0.17	1.00		0.36	1.00		0.77	1.00		1.00	1.00	
Satd. Flow (perm)	312	4993		664	5025		1417	1566		3574	1566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	701	35	3	1351	6	65	0	15	2	0	2
RTOR Reduction (vph)	0	3	0	0	0	0	0	13	0	0	2	0
Lane Group Flow (vph)	2	733	0	3	1357	0	65	2	0	2	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	60.4	59.2		60.4	59.2		14.4	9.2		2.4	1.2	
Effective Green, g (s)	60.4	59.2		60.4	59.2		14.4	9.2		2.4	1.2	
Actuated g/C Ratio	0.67	0.65		0.67	0.65		0.16	0.10		0.03	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	226	3255		456	3276		258	158		92	20	
v/s Ratio Prot	c0.00	0.15		0.00	c0.27		c0.03	0.00		0.00	0.00	
v/s Ratio Perm	0.01			0.00			c0.01			0.00		
v/c Ratio	0.01	0.23		0.01	0.41		0.25	0.01		0.02	0.00	
Uniform Delay, d1	5.3	6.4		5.1	7.5		33.4	36.7		43.1	44.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.2		0.0	0.4		0.5	0.0		0.1	0.0	
Delay (s)	5.3	6.6		5.1	7.9		33.9	36.7		43.2	44.2	
Level of Service	A	A		A	A		C	D		D	D	
Approach Delay (s)		6.6			7.9			34.4			43.7	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	90.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

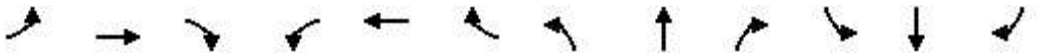
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	747	128	196	965	404	198	488	156	209	355	54
Future Volume (vph)	115	747	128	196	965	404	198	488	156	209	355	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4919		1750	4806		1750	3373		1750	3431	
Flt Permitted	0.11	1.00		0.24	1.00		0.41	1.00		0.19	1.00	
Satd. Flow (perm)	199	4919		435	4806		747	3373		354	3431	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	122	795	136	209	1027	430	211	519	166	222	378	57
RTOR Reduction (vph)	0	23	0	0	73	0	0	32	0	0	13	0
Lane Group Flow (vph)	122	908	0	209	1384	0	211	653	0	222	422	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	44.1	37.1		44.1	37.1		30.2	23.2		30.2	23.2	
Effective Green, g (s)	44.1	37.1		44.1	37.1		30.2	23.2		30.2	23.2	
Actuated g/C Ratio	0.47	0.39		0.47	0.39		0.32	0.25		0.32	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	208	1935		301	1890		313	829		216	844	
v/s Ratio Prot	0.04	0.18		c0.05	c0.29		0.05	0.19		c0.08	0.12	
v/s Ratio Perm	0.23			0.27			0.17			c0.25		
v/c Ratio	0.59	0.47		0.69	0.73		0.67	0.79		1.03	0.50	
Uniform Delay, d1	16.9	21.3		15.6	24.4		25.8	33.2		28.8	30.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	0.8		6.8	2.6		5.6	5.0		68.6	0.5	
Delay (s)	21.1	22.1		22.4	26.9		31.5	38.2		97.4	31.0	
Level of Service	C	C		C	C		C	D		F	C	
Approach Delay (s)		22.0			26.4			36.6			53.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	94.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

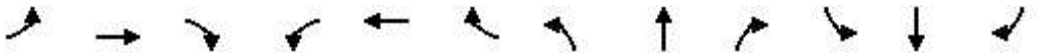
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	147	42	35	205	27	77	357	31	19	527	350
Future Volume (vph)	265	147	42	35	205	27	77	357	31	19	527	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1780		1750	1810		1750	3458		1750	3290	
Flt Permitted	0.27	1.00		0.63	1.00		0.16	1.00		0.50	1.00	
Satd. Flow (perm)	493	1780		1154	1810		291	3458		923	3290	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	294	163	47	39	228	30	86	397	34	21	586	389
RTOR Reduction (vph)	0	10	0	0	4	0	0	5	0	0	96	0
Lane Group Flow (vph)	294	200	0	39	254	0	86	426	0	21	879	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	40.1	40.1		18.4	18.4		51.1	45.8		45.7	43.1	
Effective Green, g (s)	40.1	40.1		18.4	18.4		51.1	45.8		45.7	43.1	
Actuated g/C Ratio	0.38	0.38		0.18	0.18		0.49	0.44		0.44	0.41	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	402	683		203	318		216	1515		424	1356	
v/s Ratio Prot	c0.12	0.11			0.14		c0.02	0.12		0.00	c0.27	
v/s Ratio Perm	c0.16			0.03			0.17			0.02		
v/c Ratio	0.73	0.29		0.19	0.80		0.40	0.28		0.05	0.65	
Uniform Delay, d1	24.9	22.4		36.7	41.3		16.9	18.8		16.7	24.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.7	0.2		0.5	13.0		1.2	0.5		0.0	2.4	
Delay (s)	31.6	22.6		37.2	54.3		18.1	19.3		16.8	27.0	
Level of Service	C	C		D	D		B	B		B	C	
Approach Delay (s)		27.8			52.1			19.1			26.8	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	104.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		

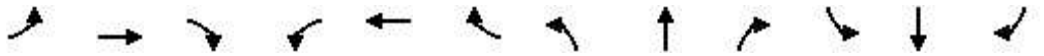
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	45	17	266	141	31	15	415	235	39	613	49
Future Volume (vph)	18	45	17	266	141	31	15	415	235	39	613	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1767		1750	1792		1750	3310		1750	3461	
Flt Permitted	0.54	1.00		0.71	1.00		0.34	1.00		0.33	1.00	
Satd. Flow (perm)	996	1767		1310	1792		629	3310		606	3461	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	20	51	19	299	158	35	17	466	264	44	689	55
RTOR Reduction (vph)	0	12	0	0	7	0	0	66	0	0	5	0
Lane Group Flow (vph)	20	58	0	299	186	0	17	664	0	44	739	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.1	24.1		24.1	24.1		62.7	60.0		65.5	61.4	
Effective Green, g (s)	24.1	24.1		24.1	24.1		62.7	60.0		65.5	61.4	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.60	0.58		0.63	0.59	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	230	408		302	414		407	1905		425	2039	
v/s Ratio Prot		0.03			0.10		0.00	0.20		c0.00	c0.21	
v/s Ratio Perm	0.02			c0.23			0.02			0.06		
v/c Ratio	0.09	0.14		0.99	0.45		0.04	0.35		0.10	0.36	
Uniform Delay, d1	31.4	31.8		39.9	34.4		8.4	11.7		7.7	11.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		48.9	0.8		0.0	0.5		0.1	0.5	
Delay (s)	31.6	32.0		88.9	35.1		8.5	12.2		7.8	11.7	
Level of Service	C	C		F	D		A	B		A	B	
Approach Delay (s)		31.9			67.8			12.1			11.5	
Approach LOS		C			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	512	156	31	935	199	187	267	17	324	542	83
Future Volume (vph)	61	512	156	31	935	199	187	267	17	324	542	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3377		1750	3408		1750	3469		1750	3430	
Flt Permitted	0.11	1.00		0.26	1.00		0.30	1.00		0.52	1.00	
Satd. Flow (perm)	198	3377		477	3408		546	3469		949	3430	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	65	545	166	33	995	212	199	284	18	345	577	88
RTOR Reduction (vph)	0	25	0	0	16	0	0	4	0	0	11	0
Lane Group Flow (vph)	65	686	0	33	1191	0	199	298	0	345	654	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.7	37.2		39.9	35.8		45.5	35.1		50.1	37.4	
Effective Green, g (s)	42.7	37.2		39.9	35.8		45.5	35.1		50.1	37.4	
Actuated g/C Ratio	0.39	0.34		0.37	0.33		0.42	0.32		0.46	0.34	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	155	1151		222	1118		342	1116		529	1175	
v/s Ratio Prot	c0.02	0.20		0.01	c0.35		0.06	0.09		c0.08	0.19	
v/s Ratio Perm	0.14			0.05			0.19			c0.22		
v/c Ratio	0.42	0.60		0.15	1.07		0.58	0.27		0.65	0.56	
Uniform Delay, d1	26.2	29.7		23.0	36.6		21.4	27.5		20.4	29.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.8		0.3	46.1		2.5	0.6		2.9	1.9	
Delay (s)	28.1	30.6		23.3	82.7		23.9	28.0		23.2	31.0	
Level of Service	C	C		C	F		C	C		C	C	
Approach Delay (s)		30.4			81.1			26.4			28.4	
Approach LOS		C			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	109.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	101.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	R	L	T	R
Maximum Queue (m)	47.1	80.6	77.3	28.1	44.6	32.2	23.4	43.1	18.3	34.8	41.8	15.8
Average Queue (m)	17.9	49.5	44.9	10.3	21.4	12.3	5.9	16.8	6.2	13.4	15.4	4.5
95th Queue (m)	33.6	71.2	68.9	23.2	37.3	27.3	15.9	33.5	14.4	27.8	31.3	11.4
Link Distance (m)		319.7	319.7					210.3			335.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	80.0			50.0			60.0		30.0	50.0		30.0
Storage Blk Time (%)		0			0			2	0		1	
Queuing Penalty (veh)		0			0			3	0		2	

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	T	T	TR	L	T	T	TR	L	TR	L	TR	
Maximum Queue (m)	33.4	28.8	16.7	10.3	21.1	12.4	4.7	9.4	9.0	1.7	7.6	
Average Queue (m)	11.6	4.9	2.4	1.3	3.8	0.8	0.3	0.8	2.1	0.1	0.4	
95th Queue (m)	30.9	17.9	10.6	6.5	14.8	5.6	2.6	5.0	7.7	1.2	3.0	
Link Distance (m)									126.7		81.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)				30.0				30.0		40.0		
Storage Blk Time (%)	0											
Queuing Penalty (veh)	0											

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	23.2	67.1	57.4	40.7	54.3	46.8	30.8	28.1	25.4	33.6	34.9	94.3
Average Queue (m)	8.9	39.4	28.5	14.9	26.3	21.8	12.2	12.0	9.8	18.8	13.4	41.0
95th Queue (m)	18.0	60.9	49.7	30.1	44.8	38.6	24.9	23.2	19.7	30.8	26.3	71.3
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0				80.0				80.0			140.0
Storage Blk Time (%)					0							
Queuing Penalty (veh)					0							

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	51.0	45.7
Average Queue (m)	26.8	22.4
95th Queue (m)	44.8	40.0
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	62.9	75.7	16.0	39.5	13.0	35.7	32.6	11.8	40.7	59.5
Average Queue (m)	35.2	25.9	4.6	16.8	4.2	16.8	12.3	1.8	16.6	25.7
95th Queue (m)	57.0	51.5	13.4	31.4	12.2	31.7	26.9	8.1	33.6	46.9
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	7	1	0	9		0			0	
Queuing Penalty (veh)	13	3	0	2		0			0	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	16.0	31.8	40.5	24.7	1.1	27.1	30.3	9.8	18.2	18.6
Average Queue (m)	3.6	10.8	20.0	7.6	0.0	5.4	7.9	1.1	2.2	3.2
95th Queue (m)	11.6	22.7	35.9	18.2	0.5	17.3	23.0	4.7	10.6	11.8
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)		0				0				
Queuing Penalty (veh)		0				0				

Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	59.6	107.0	94.6	17.1	58.8	57.0	29.3	37.0	38.2	60.2	36.1	33.5
Average Queue (m)	16.5	62.0	55.0	6.3	35.4	29.2	12.2	17.0	18.5	32.8	16.6	13.9
95th Queue (m)	40.3	91.1	84.6	15.7	54.6	51.5	25.3	32.5	34.3	55.3	29.8	27.5
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			70.0			60.0			70.0		
Storage Blk Time (%)		17								0		
Queuing Penalty (veh)		13								0		

Zone Summary

Zone wide Queuing Penalty: 36

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	R	L	T	R
Maximum Queue (m)	29.4	57.5	62.1	74.6	91.7	98.0	19.5	65.0	55.0	26.8	62.9	55.0
Average Queue (m)	16.3	38.9	32.8	22.5	60.3	51.5	6.9	26.7	7.0	12.9	31.3	18.9
95th Queue (m)	27.0	56.6	57.8	45.0	88.8	79.3	15.5	46.9	23.1	24.3	58.5	46.3
Link Distance (m)		319.7	319.7		232.1	232.1		210.3			335.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	80.0			50.0			60.0		30.0	50.0		30.0
Storage Blk Time (%)				0	14			7			10	2
Queuing Penalty (veh)				0	27			14			33	6

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	T	T	TR	T	T	TR	L	TR	L	TR	
Maximum Queue (m)	8.2	33.6	21.2	22.9	49.1	48.4	32.1	20.5	7.8	8.4	8.0	
Average Queue (m)	1.2	16.1	5.0	3.4	27.0	17.6	6.6	10.2	1.7	0.3	1.0	
95th Queue (m)	5.9	31.8	15.2	13.2	47.7	38.7	18.7	18.9	6.9	2.8	5.3	
Link Distance (m)		218.9	218.9	218.9					126.7		81.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0							30.0		40.0		
Storage Blk Time (%)		0			4							
Queuing Penalty (veh)		0			0							

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	33.0	65.2	56.3	39.9	45.8	85.5	91.6	93.9	70.5	71.4	69.6	57.8
Average Queue (m)	16.3	42.7	34.4	20.6	26.4	55.3	49.1	47.7	29.5	43.6	44.1	36.1
95th Queue (m)	30.1	63.6	50.5	37.2	41.0	79.2	77.5	75.6	54.1	64.6	63.2	56.3
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0				80.0				80.0			140.0
Storage Blk Time (%)						0						
Queuing Penalty (veh)						1						

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	60.9	47.4
Average Queue (m)	32.7	26.9
95th Queue (m)	54.7	46.1
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	64.7	99.3	44.8	60.5	28.0	53.6	35.8	64.7	82.9	102.5
Average Queue (m)	39.4	35.0	7.5	37.9	13.3	22.8	20.1	4.4	42.3	60.5
95th Queue (m)	63.2	74.0	22.3	57.1	24.8	41.4	35.2	23.9	74.1	98.8
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	9	2	1	37		1			11	
Queuing Penalty (veh)	17	4	3	13		1			2	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	11.1	26.6	103.8	46.1	2.2	37.4	54.6	15.5	38.6	53.8
Average Queue (m)	2.2	10.3	55.1	21.6	0.4	13.9	16.8	3.8	16.0	19.2
95th Queue (m)	6.7	22.8	90.6	37.6	1.7	32.3	39.1	11.0	37.4	44.5
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)			0			0			0	
Queuing Penalty (veh)			1			0			0	

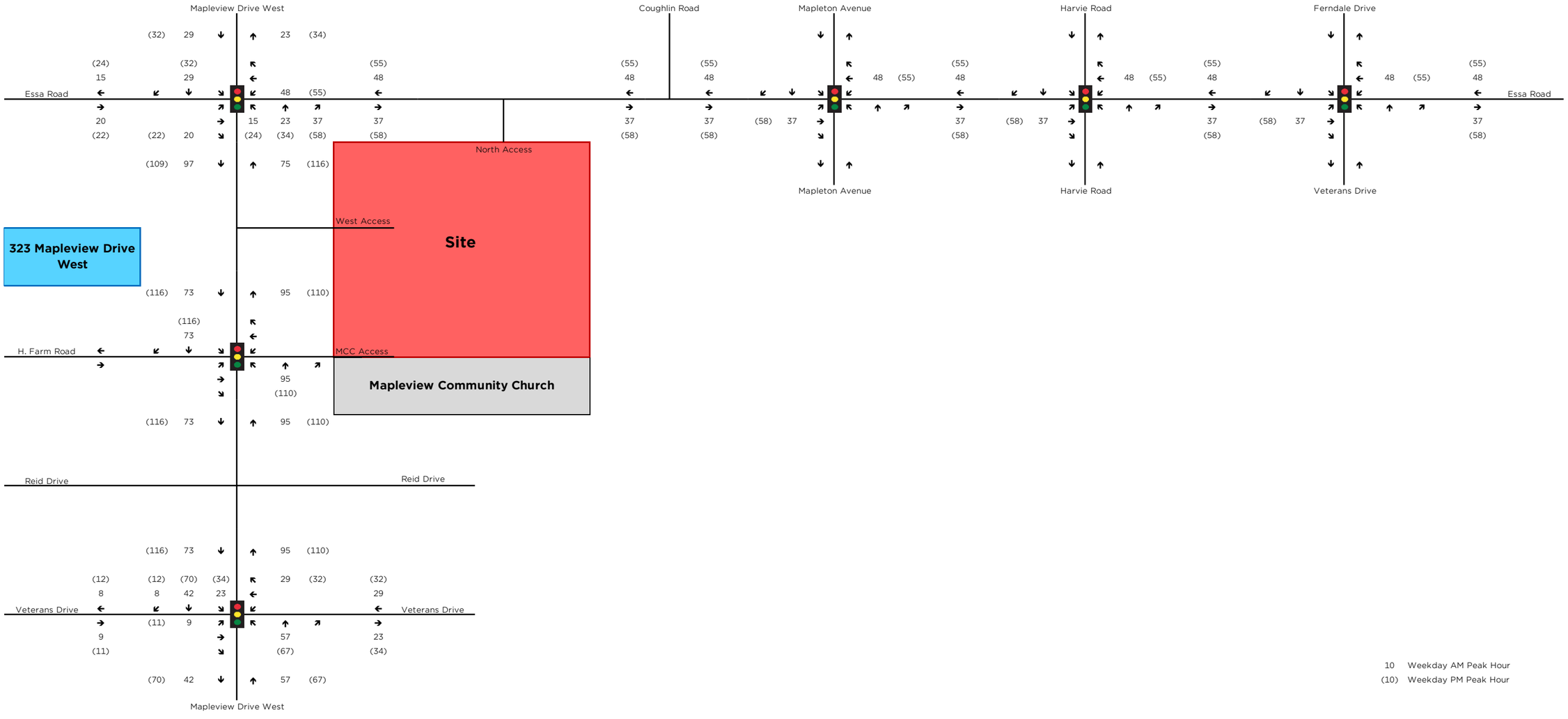
Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	33.2	85.3	73.7	94.9	151.1	141.6	54.2	32.6	41.1	88.2	70.6	69.2
Average Queue (m)	13.1	47.0	43.4	15.3	104.5	99.4	27.7	15.2	19.1	38.8	42.7	42.8
95th Queue (m)	25.3	72.9	66.8	59.8	144.1	146.4	47.7	27.7	35.3	68.9	66.4	62.7
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			70.0			60.0			70.0		
Storage Blk Time (%)		7			32		0			1	0	
Queuing Penalty (veh)		4			10		0			2	1	

Zone Summary

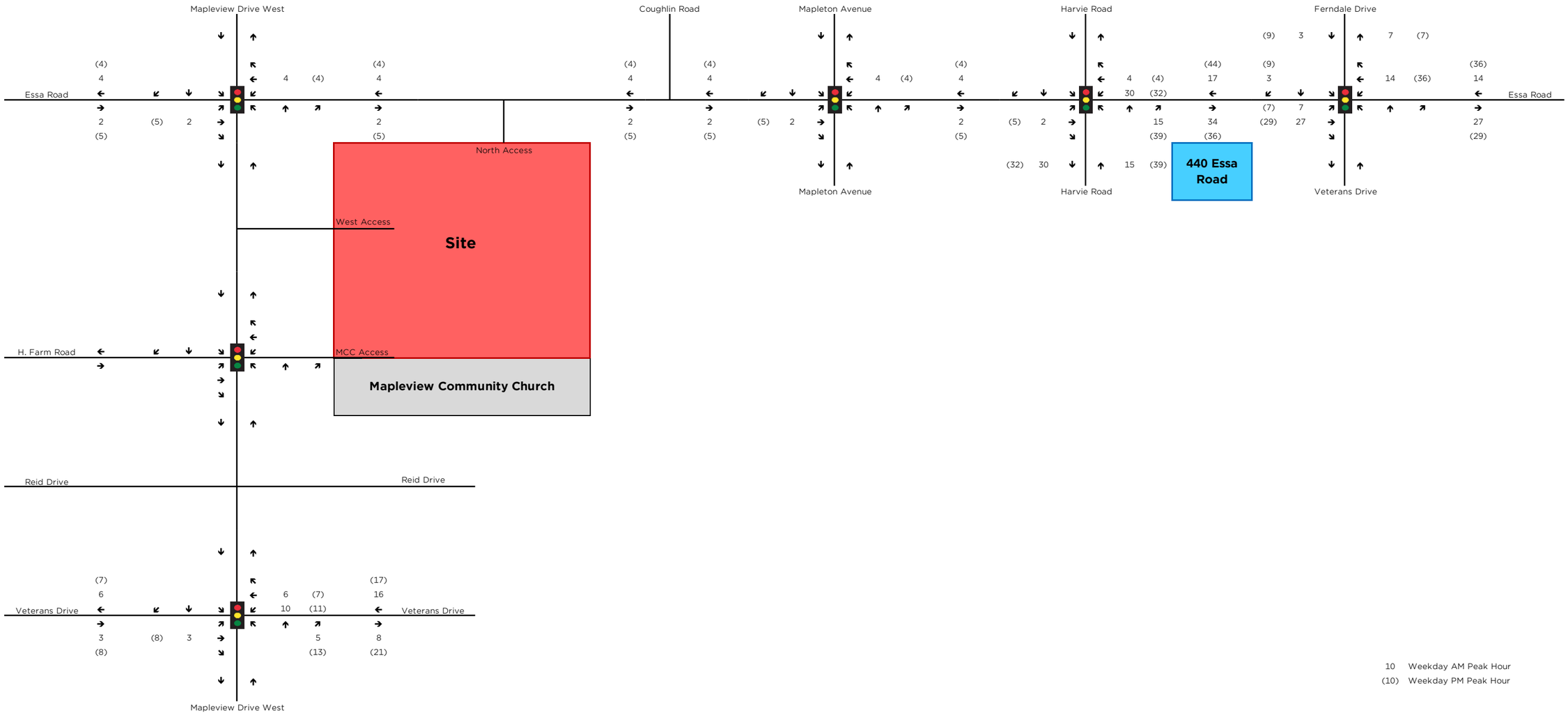
Zone wide Queuing Penalty: 139

Appendix D: Background Development Trip Distribution



MAPLEVIEW & ESSA DEVELOPMENT

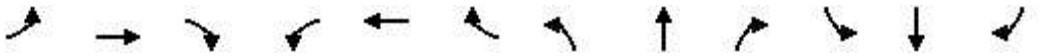
Figure D1: 323 Mapleview Drive West



MAPLEVIEW & ESSA DEVELOPMENT

Figure D2: 440 Essa Road

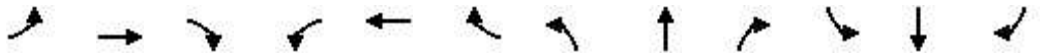
Appendix E:
Future Background Operations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	824	36	110	312	102	47	180	186	165	207	128
Future Volume (vph)	152	824	36	110	312	102	47	180	186	165	207	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3478		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.54	1.00		0.13	1.00	1.00	0.62	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	986	3478		237	3500	1566	1136	1842	1566	995	1842	1566
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	167	905	40	121	343	112	52	198	204	181	227	141
RTOR Reduction (vph)	0	3	0	0	0	76	0	0	139	0	0	80
Lane Group Flow (vph)	167	942	0	121	343	36	52	198	65	181	227	61
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	37.3	30.3		38.9	31.1	31.1	31.1	31.1	31.1	42.1	42.1	42.1
Effective Green, g (s)	37.3	30.3		38.9	31.1	31.1	31.1	31.1	31.1	42.1	42.1	42.1
Actuated g/C Ratio	0.38	0.31		0.40	0.32	0.32	0.32	0.32	0.32	0.43	0.43	0.43
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	433	1084		216	1119	501	363	589	501	485	797	678
v/s Ratio Prot	0.03	c0.27		c0.04	0.10			0.11		c0.03	0.12	
v/s Ratio Perm	0.12			0.18		0.02	0.05		0.04	c0.13		0.04
v/c Ratio	0.39	0.87		0.56	0.31	0.07	0.14	0.34	0.13	0.37	0.28	0.09
Uniform Delay, d1	20.4	31.6		21.4	24.9	23.0	23.6	25.2	23.5	17.6	17.8	16.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	7.6		3.3	0.2	0.1	0.8	1.5	0.5	0.5	0.9	0.3
Delay (s)	21.0	39.1		24.7	25.1	23.1	24.4	26.7	24.0	18.1	18.7	16.5
Level of Service	C	D		C	C	C	C	C	C	B	B	B
Approach Delay (s)		36.4			24.6			25.2			17.9	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	21.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

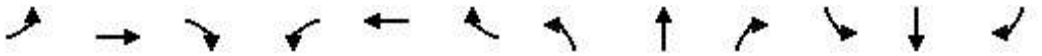
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1108	39	16	553	1	3	0	13	1	0	1
Future Volume (vph)	1	1108	39	16	553	1	3	0	13	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	5003		1750	5028		1750	1566		3395	1566	
Flt Permitted	0.41	1.00		0.20	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)	752	5003		366	5028		1842	1566		3574	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	1231	43	18	614	1	3	0	14	1	0	1
RTOR Reduction (vph)	0	2	0	0	0	0	0	14	0	0	1	0
Lane Group Flow (vph)	1	1272	0	18	615	0	3	0	0	1	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Effective Green, g (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Actuated g/C Ratio	0.74	0.73		0.74	0.73		0.04	0.02		0.02	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	571	3654		289	3672		65	28		86	19	
v/s Ratio Prot	0.00	c0.25		c0.00	0.12		c0.00	0.00		0.00	0.00	
v/s Ratio Perm	0.00			0.05			c0.00			0.00		
v/c Ratio	0.00	0.35		0.06	0.17		0.05	0.01		0.01	0.00	
Uniform Delay, d1	2.9	4.3		3.0	3.7		41.1	42.6		42.0	43.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.1		0.3	0.1		0.1	0.0	
Delay (s)	2.9	4.6		3.1	3.8		41.4	42.7		42.1	43.1	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		4.6			3.7			42.5			42.6	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

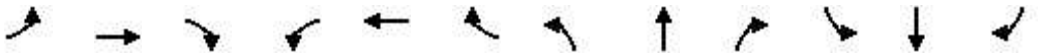
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	851	117	216	531	116	76	182	133	224	400	73
Future Volume (vph)	94	851	117	216	531	116	76	182	133	224	400	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4937		1750	4893		1750	3279		1750	3419	
Flt Permitted	0.36	1.00		0.18	1.00		0.42	1.00		0.51	1.00	
Satd. Flow (perm)	668	4937		335	4893		772	3279		943	3419	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	97	877	121	223	547	120	78	188	137	231	412	75
RTOR Reduction (vph)	0	20	0	0	38	0	0	97	0	0	16	0
Lane Group Flow (vph)	97	978	0	223	629	0	78	228	0	231	471	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.4	30.8		39.2	32.2		32.4	26.8		35.2	28.2	
Effective Green, g (s)	36.4	30.8		39.2	32.2		32.4	26.8		35.2	28.2	
Actuated g/C Ratio	0.40	0.34		0.43	0.35		0.35	0.29		0.38	0.31	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	331	1660		251	1720		332	959		424	1052	
v/s Ratio Prot	0.02	0.20		c0.07	0.13		0.01	0.07		c0.04	0.14	
v/s Ratio Perm	0.10			c0.31			0.07			c0.17		
v/c Ratio	0.29	0.59		0.89	0.37		0.23	0.24		0.54	0.45	
Uniform Delay, d1	17.6	25.2		19.4	22.1		20.1	24.6		20.4	25.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.5		29.2	0.1		0.4	0.6		1.4	1.4	
Delay (s)	18.1	25.7		48.5	22.2		20.4	25.2		21.9	26.8	
Level of Service	B	C		D	C		C	C		C	C	
Approach Delay (s)		25.0			28.8			24.3			25.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	91.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

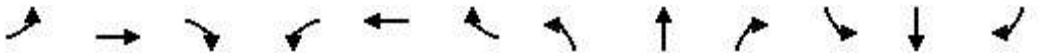
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	143	54	18	73	20	25	375	15	13	352	184
Future Volume (vph)	274	143	54	18	73	20	25	375	15	13	352	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1783		1750	3479		1750	3320	
Flt Permitted	0.47	1.00		0.63	1.00		0.40	1.00		0.51	1.00	
Satd. Flow (perm)	865	1766		1156	1783		743	3479		941	3320	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	288	151	57	19	77	21	26	395	16	14	371	194
RTOR Reduction (vph)	0	16	0	0	12	0	0	2	0	0	57	0
Lane Group Flow (vph)	288	192	0	19	86	0	26	409	0	14	508	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.1	23.1		8.4	8.4		45.2	42.7		42.6	41.4	
Effective Green, g (s)	23.1	23.1		8.4	8.4		45.2	42.7		42.6	41.4	
Actuated g/C Ratio	0.28	0.28		0.10	0.10		0.54	0.51		0.51	0.50	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	354	491		116	180		434	1789		494	1656	
v/s Ratio Prot	c0.10	0.11			0.05		c0.00	0.12		0.00	c0.15	
v/s Ratio Perm	c0.12			0.02			0.03			0.01		
v/c Ratio	0.81	0.39		0.16	0.48		0.06	0.23		0.03	0.31	
Uniform Delay, d1	26.4	24.3		34.1	35.2		8.8	11.1		9.9	12.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.3	0.5		0.7	2.0		0.1	0.3		0.0	0.5	
Delay (s)	39.7	24.8		34.8	37.2		8.9	11.4		9.9	12.8	
Level of Service	D	C		C	D		A	B		A	B	
Approach Delay (s)		33.4			36.8			11.2			12.7	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

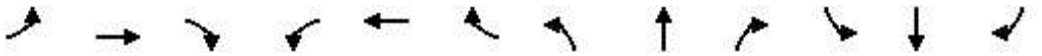
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	61	17	118	37	26	4	399	246	50	415	9
Future Volume (vph)	28	61	17	118	37	26	4	399	246	50	415	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.94		1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1782		1750	1727		1750	3299		1750	3488	
Flt Permitted	0.71	1.00		0.48	1.00		0.49	1.00		0.33	1.00	
Satd. Flow (perm)	1314	1782		877	1727		905	3299		609	3488	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	65	18	126	39	28	4	424	262	53	441	10
RTOR Reduction (vph)	0	11	0	0	22	0	0	81	0	0	1	0
Lane Group Flow (vph)	30	72	0	126	45	0	4	605	0	53	450	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.4	8.4		20.6	20.6		52.8	51.5		60.9	55.6	
Effective Green, g (s)	8.4	8.4		20.6	20.6		52.8	51.5		60.9	55.6	
Actuated g/C Ratio	0.09	0.09		0.22	0.22		0.56	0.55		0.65	0.59	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	160		269	380		522	1817		462	2074	
v/s Ratio Prot		0.04		c0.04	0.03		0.00	c0.18		c0.01	0.13	
v/s Ratio Perm	0.02			c0.06			0.00			0.07		
v/c Ratio	0.25	0.45		0.47	0.12		0.01	0.33		0.11	0.22	
Uniform Delay, d1	39.6	40.4		30.7	29.2		8.9	11.6		6.3	8.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	2.0		1.3	0.1		0.0	0.5		0.1	0.2	
Delay (s)	40.8	42.4		32.0	29.3		8.9	12.0		6.4	9.1	
Level of Service	D	D		C	C		A	B		A	A	
Approach Delay (s)		41.9			31.1			12.0			8.8	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	93.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	624	115	26	312	114	112	336	11	239	337	23
Future Volume (vph)	82	624	115	26	312	114	112	336	11	239	337	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3418		1750	3359		1750	3483		1750	3466	
Flt Permitted	0.36	1.00		0.17	1.00		0.52	1.00		0.48	1.00	
Satd. Flow (perm)	661	3418		315	3359		963	3483		886	3466	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	88	671	124	28	335	123	120	361	12	257	362	25
RTOR Reduction (vph)	0	16	0	0	38	0	0	2	0	0	5	0
Lane Group Flow (vph)	88	779	0	28	420	0	120	371	0	257	382	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	30.3	24.9		27.3	23.4		43.9	36.8		48.9	39.3	
Effective Green, g (s)	30.3	24.9		27.3	23.4		43.9	36.8		48.9	39.3	
Actuated g/C Ratio	0.32	0.26		0.29	0.25		0.46	0.39		0.51	0.41	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	272	893		149	825		502	1346		542	1430	
v/s Ratio Prot	c0.02	c0.23		0.01	0.12		0.02	0.11		c0.05	0.11	
v/s Ratio Perm	0.08			0.05			0.09			c0.20		
v/c Ratio	0.32	0.87		0.19	0.51		0.24	0.28		0.47	0.27	
Uniform Delay, d1	23.5	33.6		25.6	30.9		14.8	20.0		13.3	18.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	9.4		0.6	0.5		0.2	0.5		0.7	0.5	
Delay (s)	24.2	43.0		26.3	31.4		15.1	20.6		13.9	18.9	
Level of Service	C	D		C	C		B	C		B	B	
Approach Delay (s)		41.2			31.1			19.2			16.9	
Approach LOS		D			C			B			B	

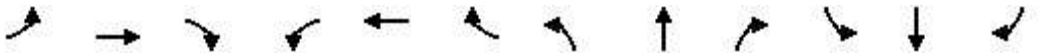
Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	95.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	526	25	244	1031	335	66	290	183	164	281	245
Future Volume (vph)	125	526	25	244	1031	335	66	290	183	164	281	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3476		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.14	1.00		0.28	1.00	1.00	0.58	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	258	3476		510	3500	1566	1073	1842	1566	743	1842	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	129	542	26	252	1063	345	68	299	189	169	290	253
RTOR Reduction (vph)	0	4	0	0	0	230	0	0	113	0	0	126
Lane Group Flow (vph)	129	564	0	252	1063	115	68	299	76	169	290	127
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	35.6	28.6		44.1	33.1	33.1	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	35.6	28.6		44.1	33.1	33.1	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.36	0.29		0.45	0.33	0.33	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	198	1003		370	1169	523	335	576	489	386	780	663
v/s Ratio Prot	0.05	0.16		c0.08	c0.30			c0.16		c0.03	0.16	
v/s Ratio Perm	0.19			0.22		0.07	0.06		0.05	0.15		0.08
v/c Ratio	0.65	0.56		0.68	0.91	0.22	0.20	0.52	0.16	0.44	0.37	0.19
Uniform Delay, d1	24.2	29.9		18.9	31.6	23.7	25.0	27.9	24.6	18.9	19.5	17.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.5	0.7		5.1	10.3	0.2	1.4	3.3	0.7	0.8	1.4	0.6
Delay (s)	31.7	30.7		24.0	41.9	23.9	26.3	31.3	25.3	19.7	20.9	18.5
Level of Service	C	C		C	D	C	C	C	C	B	C	B
Approach Delay (s)		30.9			35.5			28.6			19.8	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	99.1	Sum of lost time (s)	21.0
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		

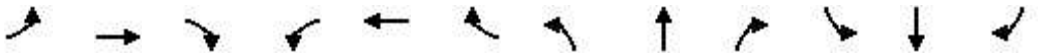
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	859	37	3	1540	7	65	0	15	2	0	2
Future Volume (vph)	2	859	37	3	1540	7	65	0	15	2	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4998		1750	5026		1750	1566		3395	1566	
Flt Permitted	0.12	1.00		0.28	1.00		0.77	1.00		1.00	1.00	
Satd. Flow (perm)	218	4998		522	5026		1417	1566		3574	1566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	904	39	3	1621	7	68	0	16	2	0	2
RTOR Reduction (vph)	0	3	0	0	0	0	0	14	0	0	2	0
Lane Group Flow (vph)	2	940	0	3	1628	0	68	2	0	2	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	60.0	58.8		60.0	58.8		14.4	9.2		2.4	1.2	
Effective Green, g (s)	60.0	58.8		60.0	58.8		14.4	9.2		2.4	1.2	
Actuated g/C Ratio	0.66	0.65		0.66	0.65		0.16	0.10		0.03	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	165	3250		362	3269		259	159		92	20	
v/s Ratio Prot	c0.00	0.19		0.00	c0.32		c0.03	0.00		0.00	0.00	
v/s Ratio Perm	0.01			0.01			c0.02			0.00		
v/c Ratio	0.01	0.29		0.01	0.50		0.26	0.01		0.02	0.00	
Uniform Delay, d1	5.6	6.8		5.1	8.2		33.2	36.5		42.9	44.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.2		0.0	0.5		0.5	0.0		0.1	0.0	
Delay (s)	5.7	7.0		5.1	8.7		33.8	36.5		43.0	44.0	
Level of Service	A	A		A	A		C	D		D	D	
Approach Delay (s)		7.0			8.7			34.3			43.5	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

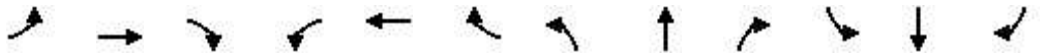
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	903	154	218	1143	351	230	547	172	184	399	92
Future Volume (vph)	162	903	154	218	1143	351	230	547	172	184	399	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4919		1750	4852		1750	3374		1750	3401	
Flt Permitted	0.12	1.00		0.12	1.00		0.30	1.00		0.15	1.00	
Satd. Flow (perm)	212	4919		221	4852		558	3374		281	3401	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	172	961	164	232	1216	373	245	582	183	196	424	98
RTOR Reduction (vph)	0	20	0	0	49	0	0	28	0	0	19	0
Lane Group Flow (vph)	172	1105	0	232	1540	0	245	737	0	196	503	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.6	34.7		52.0	39.1		39.3	26.8		38.1	26.2	
Effective Green, g (s)	43.6	34.7		52.0	39.1		39.3	26.8		38.1	26.2	
Actuated g/C Ratio	0.41	0.33		0.49	0.37		0.37	0.25		0.36	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	214	1599		298	1778		345	847		264	835	
v/s Ratio Prot	0.07	0.22		c0.10	c0.32		c0.08	c0.22		0.08	0.15	
v/s Ratio Perm	0.26			0.28			0.18			0.18		
v/c Ratio	0.80	0.69		0.78	0.87		0.71	0.87		0.74	0.60	
Uniform Delay, d1	23.9	31.3		20.9	31.4		25.3	38.3		26.5	35.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.2	2.5		12.1	6.0		6.7	9.7		10.7	1.2	
Delay (s)	43.1	33.8		33.0	37.3		32.0	48.0		37.3	36.9	
Level of Service	D	C		C	D		C	D		D	D	
Approach Delay (s)		35.0			36.8			44.1			37.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	106.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	154	44	37	215	28	87	465	35	20	613	368
Future Volume (vph)	279	154	44	37	215	28	87	465	35	20	613	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1781		1750	1810		1750	3463		1750	3303	
Flt Permitted	0.27	1.00		0.62	1.00		0.12	1.00		0.42	1.00	
Satd. Flow (perm)	489	1781		1143	1810		220	3463		777	3303	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	310	171	49	41	239	31	97	517	39	22	681	409
RTOR Reduction (vph)	0	10	0	0	5	0	0	5	0	0	80	0
Lane Group Flow (vph)	310	210	0	41	265	0	97	551	0	22	1010	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.4	37.4		18.6	18.6		50.1	44.7		44.5	41.9	
Effective Green, g (s)	37.4	37.4		18.6	18.6		50.1	44.7		44.5	41.9	
Actuated g/C Ratio	0.37	0.37		0.18	0.18		0.50	0.44		0.44	0.42	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	366	661		211	334		191	1537		368	1374	
v/s Ratio Prot	c0.12	0.12			0.15		c0.03	0.16		0.00	c0.31	
v/s Ratio Perm	c0.19			0.04			0.22			0.02		
v/c Ratio	0.85	0.32		0.19	0.79		0.51	0.36		0.06	0.74	
Uniform Delay, d1	25.3	22.6		34.7	39.2		17.1	18.5		15.9	24.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.4	0.3		0.5	12.2		2.1	0.7		0.1	3.5	
Delay (s)	41.6	22.8		35.2	51.4		19.2	19.2		16.0	28.3	
Level of Service	D	C		D	D		B	B		B	C	
Approach Delay (s)		33.8			49.3			19.2			28.0	
Approach LOS		C			D			B			C	

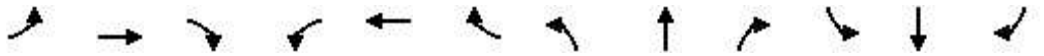
Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	47	18	280	148	72	16	500	247	73	704	51
Future Volume (vph)	19	47	18	280	148	72	16	500	247	73	704	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1751		1750	3326		1750	3465	
Flt Permitted	0.61	1.00		0.47	1.00		0.29	1.00		0.25	1.00	
Satd. Flow (perm)	1116	1766		864	1751		540	3326		468	3465	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	21	53	20	315	166	81	18	562	278	82	791	57
RTOR Reduction (vph)	0	16	0	0	20	0	0	53	0	0	4	0
Lane Group Flow (vph)	21	57	0	315	227	0	18	787	0	82	844	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.8	7.8		24.0	24.0		46.9	44.3		52.3	47.0	
Effective Green, g (s)	7.8	7.8		24.0	24.0		46.9	44.3		52.3	47.0	
Actuated g/C Ratio	0.09	0.09		0.27	0.27		0.52	0.49		0.58	0.52	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	97	153		352	469		317	1644		349	1817	
v/s Ratio Prot		0.03		c0.12	0.13		0.00	0.24		c0.01	c0.24	
v/s Ratio Perm	0.02			c0.12			0.03			0.12		
v/c Ratio	0.22	0.38		0.89	0.48		0.06	0.48		0.23	0.46	
Uniform Delay, d1	38.1	38.6		30.0	27.6		10.4	15.0		9.0	13.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	1.5		23.8	0.8		0.1	1.0		0.3	0.9	
Delay (s)	39.2	40.2		53.9	28.4		10.5	16.0		9.3	14.2	
Level of Service	D	D		D	C		B	B		A	B	
Approach Delay (s)		39.9			42.7			15.9			13.8	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	89.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

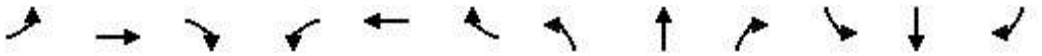
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	565	181	34	1032	165	204	368	18	255	660	87
Future Volume (vph)	67	565	181	34	1032	165	204	368	18	255	660	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3372		1750	3424		1750	3476		1750	3438	
Flt Permitted	0.10	1.00		0.23	1.00		0.19	1.00		0.45	1.00	
Satd. Flow (perm)	179	3372		432	3424		343	3476		831	3438	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	71	601	193	36	1042	176	217	391	19	271	702	93
RTOR Reduction (vph)	0	27	0	0	12	0	0	3	0	0	10	0
Lane Group Flow (vph)	71	767	0	36	1206	0	217	407	0	271	785	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	46.7	41.2		43.9	39.8		44.1	35.1		44.1	35.1	
Effective Green, g (s)	46.7	41.2		43.9	39.8		44.1	35.1		44.1	35.1	
Actuated g/C Ratio	0.43	0.38		0.40	0.36		0.40	0.32		0.40	0.32	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	155	1269		222	1245		254	1115		410	1103	
v/s Ratio Prot	c0.02	0.23		0.01	c0.35		c0.07	0.12		0.05	0.23	
v/s Ratio Perm	0.17			0.06			c0.27			0.21		
v/c Ratio	0.46	0.60		0.16	0.97		0.85	0.36		0.66	0.71	
Uniform Delay, d1	24.4	27.5		20.9	34.2		24.5	28.6		24.3	32.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.8		0.3	18.2		23.3	0.9		4.0	3.9	
Delay (s)	26.5	28.3		21.2	52.4		47.8	29.5		28.3	36.6	
Level of Service	C	C		C	D		D	C		C	D	
Approach Delay (s)		28.2			51.5			35.8			34.5	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

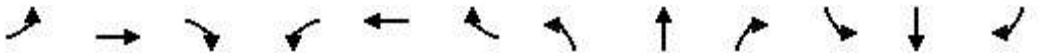
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	896	39	118	338	108	52	198	202	177	227	141
Future Volume (vph)	165	896	39	118	338	108	52	198	202	177	227	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3478		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.51	1.00		0.12	1.00	1.00	0.60	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	940	3478		226	3500	1566	1114	1842	1566	939	1842	1566
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	181	985	43	130	371	119	57	218	222	195	249	155
RTOR Reduction (vph)	0	3	0	0	0	80	0	0	152	0	0	89
Lane Group Flow (vph)	181	1025	0	130	371	39	57	218	70	195	249	66
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	38.8	31.8		40.4	32.6	32.6	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	38.8	31.8		40.4	32.6	32.6	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.39	0.32		0.41	0.33	0.33	0.31	0.31	0.31	0.43	0.43	0.43
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	427	1121		213	1157	517	350	579	492	457	784	667
v/s Ratio Prot	0.03	c0.29		c0.05	0.11			0.12		c0.03	0.14	
v/s Ratio Perm	0.14			0.20		0.03	0.05		0.04	c0.15		0.04
v/c Ratio	0.42	0.91		0.61	0.32	0.08	0.16	0.38	0.14	0.43	0.32	0.10
Uniform Delay, d1	20.2	32.1		21.9	24.7	22.7	24.4	26.3	24.3	18.6	18.8	17.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	11.3		5.1	0.2	0.1	1.0	1.9	0.6	0.6	1.1	0.3
Delay (s)	20.9	43.4		27.0	24.9	22.7	25.4	28.1	24.9	19.2	19.9	17.3
Level of Service	C	D		C	C	C	C	C	C	B	B	B
Approach Delay (s)		40.0			24.9			26.4			19.0	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	98.6	Sum of lost time (s)	21.0
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		

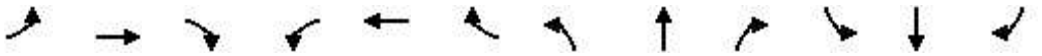
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1202	43	17	595	1	3	0	13	1	0	1
Future Volume (vph)	1	1202	43	17	595	1	3	0	13	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	5003		1750	5028		1750	1566		3395	1566	
Flt Permitted	0.39	1.00		0.17	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)	716	5003		320	5028		1842	1566		3574	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	1336	48	19	661	1	3	0	14	1	0	1
RTOR Reduction (vph)	0	2	0	0	0	0	0	14	0	0	1	0
Lane Group Flow (vph)	1	1382	0	19	662	0	3	0	0	1	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Effective Green, g (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Actuated g/C Ratio	0.74	0.73		0.74	0.73		0.04	0.02		0.02	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	544	3654		255	3672		65	28		86	19	
v/s Ratio Prot	0.00	c0.28		c0.00	0.13		c0.00	0.00		0.00	0.00	
v/s Ratio Perm	0.00			0.05			c0.00			0.00		
v/c Ratio	0.00	0.38		0.07	0.18		0.05	0.01		0.01	0.00	
Uniform Delay, d1	2.9	4.4		3.0	3.7		41.1	42.6		42.0	43.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.1		0.3	0.1		0.1	0.0	
Delay (s)	2.9	4.7		3.1	3.8		41.4	42.7		42.1	43.1	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		4.7			3.8			42.5			42.6	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

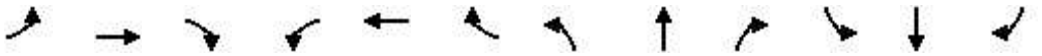
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	925	126	236	574	127	81	197	144	242	433	77
Future Volume (vph)	101	925	126	236	574	127	81	197	144	242	433	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4938		1750	4892		1750	3279		1750	3421	
Flt Permitted	0.37	1.00		0.12	1.00		0.44	1.00		0.43	1.00	
Satd. Flow (perm)	673	4938		226	4892		805	3279		798	3421	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	104	954	130	243	592	131	84	203	148	249	446	79
RTOR Reduction (vph)	0	17	0	0	34	0	0	107	0	0	14	0
Lane Group Flow (vph)	104	1067	0	243	689	0	84	244	0	249	511	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.5	30.9		46.5	36.9		33.5	27.9		42.6	33.0	
Effective Green, g (s)	36.5	30.9		46.5	36.9		33.5	27.9		42.6	33.0	
Actuated g/C Ratio	0.36	0.31		0.46	0.36		0.33	0.28		0.42	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	302	1509		278	1785		319	904		437	1116	
v/s Ratio Prot	0.02	0.22		c0.10	0.14		0.01	0.07		c0.06	0.15	
v/s Ratio Perm	0.11			c0.30			0.07			c0.18		
v/c Ratio	0.34	0.71		0.87	0.39		0.26	0.27		0.57	0.46	
Uniform Delay, d1	21.9	31.1		22.0	23.7		23.7	28.6		20.0	27.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	1.5		24.8	0.1		0.4	0.7		1.7	1.4	
Delay (s)	22.6	32.6		46.7	23.9		24.2	29.4		21.7	28.3	
Level of Service	C	C		D	C		C	C		C	C	
Approach Delay (s)		31.7			29.6			28.4			26.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	101.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

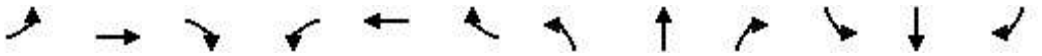
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	149	56	19	75	21	27	408	16	13	364	191
Future Volume (vph)	285	149	56	19	75	21	27	408	16	13	364	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1767		1750	1782		1750	3480		1750	3319	
Flt Permitted	0.47	1.00		0.62	1.00		0.39	1.00		0.49	1.00	
Satd. Flow (perm)	866	1767		1148	1782		723	3480		910	3319	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	300	157	59	20	79	22	28	429	17	14	383	201
RTOR Reduction (vph)	0	15	0	0	12	0	0	2	0	0	57	0
Lane Group Flow (vph)	300	201	0	20	89	0	28	444	0	14	527	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.2	23.2		8.5	8.5		45.2	42.7		42.6	41.4	
Effective Green, g (s)	23.2	23.2		8.5	8.5		45.2	42.7		42.6	41.4	
Actuated g/C Ratio	0.28	0.28		0.10	0.10		0.54	0.51		0.51	0.50	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	355	493		117	182		424	1788		478	1653	
v/s Ratio Prot	c0.11	0.11			0.05		c0.00	0.13		0.00	c0.16	
v/s Ratio Perm	c0.13			0.02			0.03			0.01		
v/c Ratio	0.85	0.41		0.17	0.49		0.07	0.25		0.03	0.32	
Uniform Delay, d1	26.7	24.4		34.1	35.3		8.9	11.3		9.9	12.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.6	0.6		0.7	2.1		0.1	0.3		0.0	0.5	
Delay (s)	43.4	24.9		34.8	37.3		8.9	11.6		10.0	12.9	
Level of Service	D	C		C	D		A	B		A	B	
Approach Delay (s)		35.6			36.9			11.4			12.9	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

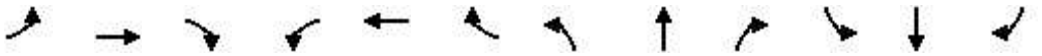
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	63	17	122	38	26	4	413	256	50	429	10
Future Volume (vph)	30	63	17	122	38	26	4	413	256	50	429	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.94		1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1784		1750	1728		1750	3299		1750	3488	
Flt Permitted	0.71	1.00		0.47	1.00		0.48	1.00		0.32	1.00	
Satd. Flow (perm)	1313	1784		872	1728		891	3299		588	3488	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	32	67	18	130	40	28	4	439	272	53	456	11
RTOR Reduction (vph)	0	11	0	0	22	0	0	82	0	0	1	0
Lane Group Flow (vph)	32	74	0	130	46	0	4	629	0	53	466	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.3	8.3		20.5	20.5		52.3	51.0		60.4	55.1	
Effective Green, g (s)	8.3	8.3		20.5	20.5		52.3	51.0		60.4	55.1	
Actuated g/C Ratio	0.09	0.09		0.22	0.22		0.56	0.55		0.65	0.59	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	117	159		269	381		513	1811		449	2068	
v/s Ratio Prot		0.04		c0.04	0.03		0.00	c0.19		c0.01	0.13	
v/s Ratio Perm	0.02			c0.06			0.00			0.07		
v/c Ratio	0.27	0.47		0.48	0.12		0.01	0.35		0.12	0.23	
Uniform Delay, d1	39.5	40.2		30.6	29.0		8.9	11.7		6.3	8.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	2.2		1.4	0.1		0.0	0.5		0.1	0.3	
Delay (s)	40.8	42.3		31.9	29.1		8.9	12.2		6.5	9.1	
Level of Service	D	D		C	C		A	B		A	A	
Approach Delay (s)		41.9			31.0			12.2			8.9	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	92.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

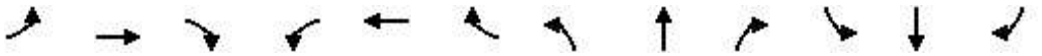
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	675	124	29	338	124	116	347	11	249	349	24
Future Volume (vph)	88	675	124	29	338	124	116	347	11	249	349	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3419		1750	3359		1750	3484		1750	3466	
Flt Permitted	0.33	1.00		0.16	1.00		0.52	1.00		0.47	1.00	
Satd. Flow (perm)	610	3419		302	3359		950	3484		860	3466	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	95	726	133	31	363	133	125	373	12	268	375	26
RTOR Reduction (vph)	0	15	0	0	38	0	0	2	0	0	5	0
Lane Group Flow (vph)	95	844	0	31	458	0	125	383	0	268	396	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	31.4	25.9		28.4	24.4		43.5	36.5		48.9	39.2	
Effective Green, g (s)	31.4	25.9		28.4	24.4		43.5	36.5		48.9	39.2	
Actuated g/C Ratio	0.33	0.27		0.30	0.25		0.45	0.38		0.51	0.41	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	264	921		149	852		488	1323		527	1413	
v/s Ratio Prot	c0.02	c0.25		0.01	0.14		0.02	0.11		c0.05	0.11	
v/s Ratio Perm	0.10			0.05			0.10			c0.21		
v/c Ratio	0.36	0.92		0.21	0.54		0.26	0.29		0.51	0.28	
Uniform Delay, d1	23.4	34.0		25.7	31.0		15.5	20.8		13.8	19.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	13.5		0.7	0.7		0.3	0.6		0.8	0.5	
Delay (s)	24.2	47.5		26.4	31.6		15.8	21.3		14.6	19.5	
Level of Service	C	D		C	C		B	C		B	B	
Approach Delay (s)		45.2			31.3			20.0			17.5	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		

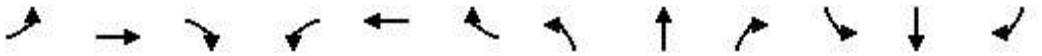
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	571	27	264	1121	360	73	319	199	175	309	270
Future Volume (vph)	136	571	27	264	1121	360	73	319	199	175	309	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3476		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.14	1.00		0.25	1.00	1.00	0.57	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	251	3476		457	3500	1566	1045	1842	1566	667	1842	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	140	589	28	272	1156	371	75	329	205	180	319	278
RTOR Reduction (vph)	0	4	0	0	0	242	0	0	113	0	0	125
Lane Group Flow (vph)	140	613	0	272	1156	129	75	329	92	180	319	153
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	36.3	29.3		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	36.3	29.3		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.36	0.29		0.45	0.34	0.34	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	1018		356	1190	532	323	571	485	355	773	657
v/s Ratio Prot	0.05	0.18		c0.09	c0.33			c0.18		c0.04	0.17	
v/s Ratio Perm	0.21			0.25		0.08	0.07		0.06	0.18		0.10
v/c Ratio	0.71	0.60		0.76	0.97	0.24	0.23	0.58	0.19	0.51	0.41	0.23
Uniform Delay, d1	25.1	30.4		19.3	32.5	23.7	25.7	29.0	25.3	19.7	20.3	18.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	1.0		9.4	19.5	0.2	1.7	4.2	0.9	1.1	1.6	0.8
Delay (s)	36.7	31.4		28.7	52.0	24.0	27.3	33.2	26.2	20.8	22.0	19.5
Level of Service	D	C		C	D	C	C	C	C	C	C	B
Approach Delay (s)		32.4			42.7			30.1			20.8	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	108.5%	ICU Level of Service	G
Analysis Period (min)	15		

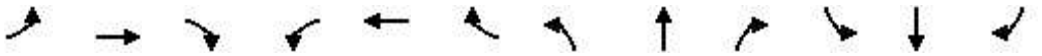
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	926	40	4	1671	7	68	0	15	2	0	2
Future Volume (vph)	2	926	40	4	1671	7	68	0	15	2	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4998		1750	5026		1750	1566		3395	1566	
Flt Permitted	0.10	1.00		0.26	1.00		0.77	1.00		1.00	1.00	
Satd. Flow (perm)	179	4998		477	5026		1417	1566		3574	1566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	975	42	4	1759	7	72	0	16	2	0	2
RTOR Reduction (vph)	0	2	0	0	0	0	0	14	0	0	2	0
Lane Group Flow (vph)	2	1015	0	4	1766	0	72	2	0	2	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	59.4	58.2		59.4	58.2		14.4	9.2		2.4	1.2	
Effective Green, g (s)	59.4	58.2		59.4	58.2		14.4	9.2		2.4	1.2	
Actuated g/C Ratio	0.66	0.65		0.66	0.65		0.16	0.10		0.03	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	139	3239		332	3257		261	160		93	20	
v/s Ratio Prot	c0.00	0.20		0.00	c0.35		c0.03	0.00		0.00	0.00	
v/s Ratio Perm	0.01			0.01			c0.02			0.00		
v/c Ratio	0.01	0.31		0.01	0.54		0.28	0.01		0.02	0.00	
Uniform Delay, d1	5.9	7.0		5.2	8.6		33.0	36.2		42.6	43.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.0	0.7		0.6	0.0		0.1	0.0	
Delay (s)	6.0	7.2		5.2	9.2		33.6	36.2		42.7	43.7	
Level of Service	A	A		A	A		C	D		D	D	
Approach Delay (s)		7.2			9.2			34.1			43.2	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	89.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

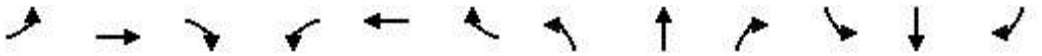
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	979	167	238	1241	382	248	591	186	198	431	97
Future Volume (vph)	174	979	167	238	1241	382	248	591	186	198	431	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4919		1750	4851		1750	3374		1750	3404	
Flt Permitted	0.11	1.00		0.10	1.00		0.28	1.00		0.15	1.00	
Satd. Flow (perm)	209	4919		187	4851		509	3374		273	3404	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	185	1041	178	253	1320	406	264	629	198	211	459	103
RTOR Reduction (vph)	0	21	0	0	50	0	0	27	0	0	17	0
Lane Group Flow (vph)	185	1198	0	253	1676	0	264	800	0	211	545	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.3	35.3		53.1	41.1		39.8	27.0		39.8	27.0	
Effective Green, g (s)	43.3	35.3		53.1	41.1		39.8	27.0		39.8	27.0	
Actuated g/C Ratio	0.40	0.32		0.49	0.38		0.37	0.25		0.37	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	196	1594		289	1830		331	836		273	843	
v/s Ratio Prot	0.07	0.24		c0.11	c0.35		c0.09	c0.24		0.09	0.16	
v/s Ratio Perm	0.31			0.31			0.20			0.19		
v/c Ratio	0.94	0.75		0.88	0.92		0.80	0.96		0.77	0.65	
Uniform Delay, d1	25.9	32.9		27.7	32.3		26.5	40.4		27.2	36.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	48.1	3.3		24.2	8.7		12.5	21.1		12.7	1.7	
Delay (s)	74.0	36.2		51.9	41.0		39.1	61.4		40.0	38.4	
Level of Service	E	D		D	D		D	E		D	D	
Approach Delay (s)		41.2			42.4			56.0			38.8	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	44.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	108.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

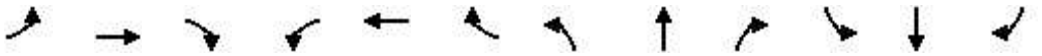
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	161	46	38	224	30	95	505	38	21	636	383
Future Volume (vph)	290	161	46	38	224	30	95	505	38	21	636	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1781		1750	1810		1750	3463		1750	3303	
Flt Permitted	0.24	1.00		0.62	1.00		0.10	1.00		0.40	1.00	
Satd. Flow (perm)	448	1781		1133	1810		180	3463		745	3303	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	322	179	51	42	249	33	106	561	42	23	707	426
RTOR Reduction (vph)	0	10	0	0	5	0	0	4	0	0	82	0
Lane Group Flow (vph)	322	220	0	42	277	0	106	599	0	23	1051	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	38.4	38.4		19.4	19.4		53.5	46.8		45.2	42.5	
Effective Green, g (s)	38.4	38.4		19.4	19.4		53.5	46.8		45.2	42.5	
Actuated g/C Ratio	0.37	0.37		0.19	0.19		0.51	0.45		0.44	0.41	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	353	658		211	337		198	1559		350	1351	
v/s Ratio Prot	c0.13	0.12			0.15		c0.04	0.17		0.00	c0.32	
v/s Ratio Perm	c0.21			0.04			0.24			0.03		
v/c Ratio	0.91	0.33		0.20	0.82		0.54	0.38		0.07	0.78	
Uniform Delay, d1	26.6	23.6		35.7	40.6		18.1	19.0		16.8	26.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.0	0.3		0.5	14.8		2.8	0.7		0.1	4.5	
Delay (s)	53.5	23.9		36.2	55.4		20.8	19.7		16.9	31.1	
Level of Service	D	C		D	E		C	B		B	C	
Approach Delay (s)		41.2			52.9			19.9			30.8	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	103.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

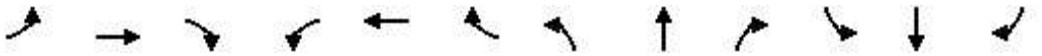
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	49	19	291	154	73	16	517	257	74	730	54
Future Volume (vph)	20	49	19	291	154	73	16	517	257	74	730	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1753		1750	3325		1750	3464	
Flt Permitted	0.60	1.00		0.47	1.00		0.28	1.00		0.24	1.00	
Satd. Flow (perm)	1108	1766		865	1753		512	3325		445	3464	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	22	55	21	327	173	82	18	581	289	83	820	61
RTOR Reduction (vph)	0	16	0	0	19	0	0	54	0	0	4	0
Lane Group Flow (vph)	22	60	0	327	236	0	18	816	0	83	877	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.9	7.9		24.1	24.1		46.9	44.3		52.3	47.0	
Effective Green, g (s)	7.9	7.9		24.1	24.1		46.9	44.3		52.3	47.0	
Actuated g/C Ratio	0.09	0.09		0.27	0.27		0.52	0.49		0.58	0.52	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	97	155		352	470		303	1642		336	1815	
v/s Ratio Prot		0.03		c0.13	0.13		0.00	0.25		c0.01	c0.25	
v/s Ratio Perm	0.02			c0.12			0.03			0.13		
v/c Ratio	0.23	0.39		0.93	0.50		0.06	0.50		0.25	0.48	
Uniform Delay, d1	38.1	38.6		30.5	27.7		10.5	15.2		9.1	13.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	1.6		30.1	0.8		0.1	1.1		0.4	0.9	
Delay (s)	39.3	40.3		60.5	28.6		10.6	16.3		9.5	14.5	
Level of Service	D	D		E	C		B	B		A	B	
Approach Delay (s)		40.0			46.5			16.2			14.1	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

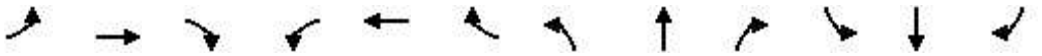
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	612	195	37	1117	178	212	379	19	266	683	91
Future Volume (vph)	73	612	195	37	1117	178	212	379	19	266	683	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3373		1750	3425		1750	3475		1750	3438	
Flt Permitted	0.08	1.00		0.21	1.00		0.15	1.00		0.41	1.00	
Satd. Flow (perm)	153	3373		394	3425		280	3475		755	3438	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	78	651	207	39	1128	189	226	403	20	283	727	97
RTOR Reduction (vph)	0	24	0	0	11	0	0	3	0	0	8	0
Lane Group Flow (vph)	78	834	0	39	1306	0	226	420	0	283	816	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	53.7	48.2		50.9	46.8		46.2	35.2		48.0	36.1	
Effective Green, g (s)	53.7	48.2		50.9	46.8		46.2	35.2		48.0	36.1	
Actuated g/C Ratio	0.45	0.40		0.43	0.39		0.39	0.29		0.40	0.30	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	1361		214	1342		243	1024		402	1039	
v/s Ratio Prot	c0.03	0.25		0.01	c0.38		c0.09	0.12		0.07	0.24	
v/s Ratio Perm	0.22			0.07			c0.27			0.21		
v/c Ratio	0.55	0.61		0.18	0.97		0.93	0.41		0.70	0.79	
Uniform Delay, d1	26.5	28.2		21.3	35.7		28.3	33.8		26.6	38.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.8		0.4	18.4		39.0	1.2		5.5	6.0	
Delay (s)	30.8	29.0		21.7	54.1		67.3	35.0		32.2	44.1	
Level of Service	C	C		C	D		E	C		C	D	
Approach Delay (s)		29.2			53.1			46.2			41.0	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	103.0%	ICU Level of Service	G
Analysis Period (min)	15		

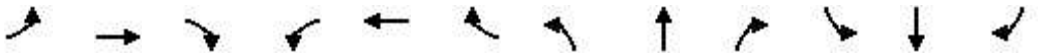
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	918	40	121	346	109	55	208	211	183	238	148
Future Volume (vph)	170	918	40	121	346	109	55	208	211	183	238	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3478		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.46	1.00		0.13	1.00	1.00	0.60	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	843	3478		238	3500	1566	1100	1842	1566	911	1842	1566
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	187	1009	44	133	380	120	60	229	232	201	262	163
RTOR Reduction (vph)	0	3	0	0	0	82	0	0	159	0	0	94
Lane Group Flow (vph)	187	1050	0	133	380	38	60	229	73	201	262	69
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	41.6	32.8		38.0	31.0	31.0	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	41.6	32.8		38.0	31.0	31.0	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.42	0.33		0.38	0.31	0.31	0.31	0.31	0.31	0.43	0.43	0.43
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	435	1154		198	1098	491	345	577	491	446	783	665
v/s Ratio Prot	c0.04	c0.30		c0.05	0.11			0.12		c0.03	0.14	
v/s Ratio Perm	0.14			0.21		0.02	0.05		0.05	c0.16		0.04
v/c Ratio	0.43	0.91		0.67	0.35	0.08	0.17	0.40	0.15	0.45	0.33	0.10
Uniform Delay, d1	18.7	31.6		23.1	26.1	23.8	24.6	26.6	24.4	19.0	19.0	17.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	10.5		8.6	0.2	0.1	1.1	2.0	0.6	0.7	1.2	0.3
Delay (s)	19.3	42.1		31.7	26.3	23.9	25.7	28.6	25.0	19.7	20.2	17.4
Level of Service	B	D		C	C	C	C	C	C	B	C	B
Approach Delay (s)		38.6			27.0			26.7			19.3	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	21.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

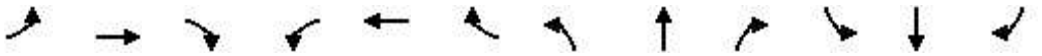
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1230	44	17	608	1	3	0	14	1	0	1
Future Volume (vph)	1	1230	44	17	608	1	3	0	14	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	5003		1750	5028		1750	1566		3395	1566	
Flt Permitted	0.38	1.00		0.17	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)	705	5003		308	5028		1842	1566		3574	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	1367	49	19	676	1	3	0	16	1	0	1
RTOR Reduction (vph)	0	2	0	0	0	0	0	16	0	0	1	0
Lane Group Flow (vph)	1	1414	0	19	677	0	3	0	0	1	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Effective Green, g (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Actuated g/C Ratio	0.74	0.73		0.74	0.73		0.04	0.02		0.02	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	536	3654		246	3672		65	28		86	19	
v/s Ratio Prot	0.00	c0.28		c0.00	0.13		c0.00	0.00		0.00	0.00	
v/s Ratio Perm	0.00			0.06			c0.00			0.00		
v/c Ratio	0.00	0.39		0.08	0.18		0.05	0.01		0.01	0.00	
Uniform Delay, d1	2.9	4.5		3.0	3.7		41.1	42.6		42.0	43.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.1		0.3	0.1		0.1	0.0	
Delay (s)	2.9	4.8		3.2	3.8		41.4	42.7		42.1	43.1	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		4.8			3.8			42.5			42.6	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

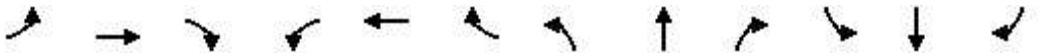
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	947	129	242	587	130	85	207	151	254	455	79
Future Volume (vph)	103	947	129	242	587	130	85	207	151	254	455	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4938		1750	4892		1750	3278		1750	3423	
Flt Permitted	0.35	1.00		0.12	1.00		0.42	1.00		0.42	1.00	
Satd. Flow (perm)	641	4938		217	4892		772	3278		772	3423	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	106	976	133	249	605	134	88	213	156	262	469	81
RTOR Reduction (vph)	0	18	0	0	35	0	0	113	0	0	13	0
Lane Group Flow (vph)	106	1091	0	249	704	0	88	256	0	262	537	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.0	30.0		45.7	34.7		33.5	27.9		42.7	33.1	
Effective Green, g (s)	37.0	30.0		45.7	34.7		33.5	27.9		42.7	33.1	
Actuated g/C Ratio	0.37	0.30		0.46	0.35		0.33	0.28		0.43	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	313	1475		277	1690		312	910		433	1128	
v/s Ratio Prot	0.02	0.22		c0.10	0.14		0.02	0.08		c0.07	0.16	
v/s Ratio Perm	0.10			c0.30			0.08			c0.19		
v/c Ratio	0.34	0.74		0.90	0.42		0.28	0.28		0.61	0.48	
Uniform Delay, d1	21.3	31.7		23.7	25.1		23.5	28.4		19.8	26.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	2.0		29.1	0.2		0.5	0.8		2.4	1.4	
Delay (s)	22.0	33.7		52.7	25.3		24.0	29.2		22.2	28.2	
Level of Service	C	C		D	C		C	C		C	C	
Approach Delay (s)		32.7			32.2			28.2			26.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

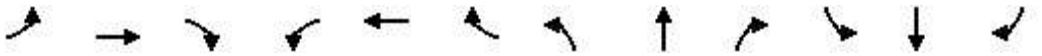
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	156	59	20	79	22	29	427	17	13	372	196
Future Volume (vph)	300	156	59	20	79	22	29	427	17	13	372	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1782		1750	3480		1750	3319	
Flt Permitted	0.47	1.00		0.62	1.00		0.37	1.00		0.48	1.00	
Satd. Flow (perm)	866	1766		1137	1782		684	3480		891	3319	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	164	62	21	83	23	31	449	18	14	392	206
RTOR Reduction (vph)	0	16	0	0	12	0	0	2	0	0	57	0
Lane Group Flow (vph)	316	210	0	21	94	0	31	465	0	14	541	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.3	23.3		8.6	8.6		48.7	44.9		43.5	42.3	
Effective Green, g (s)	23.3	23.3		8.6	8.6		48.7	44.9		43.5	42.3	
Actuated g/C Ratio	0.27	0.27		0.10	0.10		0.57	0.53		0.51	0.50	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	347	481		114	179		437	1829		465	1643	
v/s Ratio Prot	c0.11	0.12			0.05		c0.00	0.13		0.00	c0.16	
v/s Ratio Perm	c0.13			0.02			0.04			0.01		
v/c Ratio	0.91	0.44		0.18	0.53		0.07	0.25		0.03	0.33	
Uniform Delay, d1	28.6	25.6		35.2	36.5		8.2	11.1		10.4	13.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.1	0.6		0.8	2.8		0.1	0.3		0.0	0.5	
Delay (s)	55.7	26.3		36.0	39.3		8.3	11.4		10.4	13.5	
Level of Service	E	C		D	D		A	B		B	B	
Approach Delay (s)		43.4			38.7			11.2			13.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	85.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

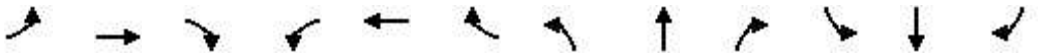
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	67	18	129	40	27	4	423	262	51	439	10
Future Volume (vph)	31	67	18	129	40	27	4	423	262	51	439	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.94		1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1784		1750	1731		1750	3299		1750	3488	
Flt Permitted	0.71	1.00		0.47	1.00		0.48	1.00		0.31	1.00	
Satd. Flow (perm)	1308	1784		872	1731		882	3299		570	3488	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	33	71	19	137	43	29	4	450	279	54	467	11
RTOR Reduction (vph)	0	11	0	0	22	0	0	82	0	0	1	0
Lane Group Flow (vph)	33	79	0	137	50	0	4	647	0	54	477	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.4	8.4		20.8	20.8		51.3	50.0		59.3	54.0	
Effective Green, g (s)	8.4	8.4		20.8	20.8		51.3	50.0		59.3	54.0	
Actuated g/C Ratio	0.09	0.09		0.23	0.23		0.56	0.54		0.64	0.59	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	119	162		277	390		503	1790		434	2045	
v/s Ratio Prot		0.04		c0.05	0.03		0.00	c0.20		c0.01	0.14	
v/s Ratio Perm	0.03			c0.07			0.00			0.07		
v/c Ratio	0.28	0.49		0.49	0.13		0.01	0.36		0.12	0.23	
Uniform Delay, d1	39.0	39.8		30.0	28.4		9.1	12.0		6.5	9.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	2.3		1.4	0.1		0.0	0.6		0.1	0.3	
Delay (s)	40.3	42.1		31.4	28.6		9.1	12.5		6.7	9.4	
Level of Service	D	D		C	C		A	B		A	A	
Approach Delay (s)		41.6			30.4			12.5			9.1	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	92.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

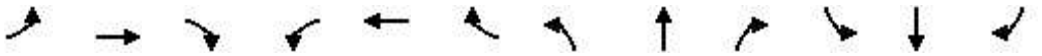
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	710	130	30	355	130	119	354	11	255	356	25
Future Volume (vph)	93	710	130	30	355	130	119	354	11	255	356	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3418		1750	3359		1750	3484		1750	3465	
Flt Permitted	0.31	1.00		0.16	1.00		0.51	1.00		0.46	1.00	
Satd. Flow (perm)	580	3418		291	3359		942	3484		844	3465	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	100	763	140	32	382	140	128	381	12	274	383	27
RTOR Reduction (vph)	0	15	0	0	38	0	0	2	0	0	5	0
Lane Group Flow (vph)	100	888	0	32	484	0	128	391	0	274	405	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.3	26.8		29.3	25.3		43.4	36.4		49.0	39.2	
Effective Green, g (s)	32.3	26.8		29.3	25.3		43.4	36.4		49.0	39.2	
Actuated g/C Ratio	0.33	0.28		0.30	0.26		0.45	0.38		0.51	0.40	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	259	944		148	876		479	1307		517	1400	
v/s Ratio Prot	c0.02	c0.26		0.01	0.14		0.02	0.11		c0.05	0.12	
v/s Ratio Perm	0.11			0.06			0.10			c0.21		
v/c Ratio	0.39	0.94		0.22	0.55		0.27	0.30		0.53	0.29	
Uniform Delay, d1	23.3	34.3		25.7	31.0		16.0	21.3		14.2	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	16.8		0.7	0.8		0.3	0.6		1.0	0.5	
Delay (s)	24.3	51.1		26.5	31.7		16.3	21.9		15.2	20.0	
Level of Service	C	D		C	C		B	C		B	C	
Approach Delay (s)		48.4			31.4			20.5			18.1	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

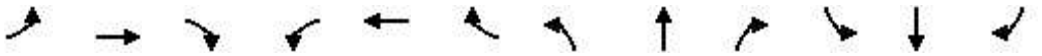
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	584	27	270	1149	367	77	335	208	181	324	284
Future Volume (vph)	140	584	27	270	1149	367	77	335	208	181	324	284
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3477		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.14	1.00		0.24	1.00	1.00	0.56	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	252	3477		440	3500	1566	1030	1842	1566	631	1842	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	144	602	28	278	1185	378	79	345	214	187	334	293
RTOR Reduction (vph)	0	4	0	0	0	240	0	0	113	0	0	124
Lane Group Flow (vph)	144	626	0	278	1185	138	79	345	101	187	334	169
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	36.2	29.2		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	36.2	29.2		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.36	0.29		0.45	0.34	0.34	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	1015		352	1190	532	319	571	485	343	773	657
v/s Ratio Prot	0.05	0.18		c0.09	c0.34			c0.19		c0.04	0.18	
v/s Ratio Perm	0.21			0.26		0.09	0.08		0.06	0.19		0.11
v/c Ratio	0.73	0.62		0.79	1.00	0.26	0.25	0.60	0.21	0.55	0.43	0.26
Uniform Delay, d1	25.4	30.6		19.5	32.9	23.9	25.8	29.3	25.4	19.9	20.5	18.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.3	1.1		11.2	24.9	0.3	1.8	4.7	1.0	1.8	1.8	0.9
Delay (s)	38.7	31.7		30.7	57.8	24.2	27.6	34.0	26.4	21.7	22.3	19.8
Level of Service	D	C		C	E	C	C	C	C	C	C	B
Approach Delay (s)		33.0			46.8			30.7			21.3	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	109.5%	ICU Level of Service	H
Analysis Period (min)	15		

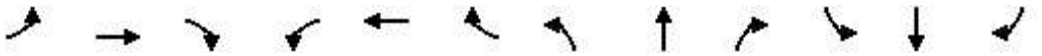
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	947	41	4	1710	7	71	0	16	2	0	2
Future Volume (vph)	2	947	41	4	1710	7	71	0	16	2	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4998		1750	5026		1750	1566		3395	1566	
Flt Permitted	0.09	1.00		0.25	1.00		0.78	1.00		1.00	1.00	
Satd. Flow (perm)	169	4998		464	5026		1445	1566		3574	1566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	997	43	4	1800	7	75	0	17	2	0	2
RTOR Reduction (vph)	0	3	0	0	0	0	0	15	0	0	2	0
Lane Group Flow (vph)	2	1037	0	4	1807	0	75	2	0	2	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	58.9	57.8		58.9	57.8		14.3	9.2		2.2	1.1	
Effective Green, g (s)	58.9	57.8		58.9	57.8		14.3	9.2		2.2	1.1	
Actuated g/C Ratio	0.66	0.65		0.66	0.65		0.16	0.10		0.02	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	131	3238		322	3256		263	161		85	19	
v/s Ratio Prot	c0.00	0.21		0.00	c0.36		c0.03	0.00		0.00	0.00	
v/s Ratio Perm	0.01			0.01			c0.02			0.00		
v/c Ratio	0.02	0.32		0.01	0.55		0.29	0.01		0.02	0.00	
Uniform Delay, d1	6.0	7.0		5.2	8.6		32.9	35.9		42.5	43.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.0	0.7		0.6	0.0		0.1	0.0	
Delay (s)	6.0	7.2		5.2	9.3		33.5	35.9		42.6	43.5	
Level of Service	A	A		A	A		C	D		D	D	
Approach Delay (s)		7.2			9.3			33.9			43.1	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

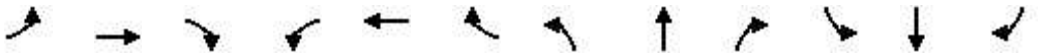
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	1002	171	244	1270	391	260	621	196	208	452	100
Future Volume (vph)	177	1002	171	244	1270	391	260	621	196	208	452	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4919		1750	4851		1750	3374		1750	3405	
Flt Permitted	0.12	1.00		0.11	1.00		0.26	1.00		0.14	1.00	
Satd. Flow (perm)	217	4919		194	4851		485	3374		256	3405	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	188	1066	182	260	1351	416	277	661	209	221	481	106
RTOR Reduction (vph)	0	21	0	0	50	0	0	28	0	0	17	0
Lane Group Flow (vph)	188	1227	0	260	1717	0	277	842	0	221	570	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.0	34.0		52.0	39.0		41.8	29.8		39.8	28.8	
Effective Green, g (s)	43.0	34.0		52.0	39.0		41.8	29.8		39.8	28.8	
Actuated g/C Ratio	0.40	0.31		0.48	0.36		0.38	0.27		0.37	0.26	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	212	1537		292	1738		325	924		244	901	
v/s Ratio Prot	0.07	0.25		c0.11	c0.35		c0.09	c0.25		0.09	0.17	
v/s Ratio Perm	0.28			0.31			0.23			0.24		
v/c Ratio	0.89	0.80		0.89	0.99		0.85	0.91		0.91	0.63	
Uniform Delay, d1	26.6	34.3		28.2	34.7		26.0	38.2		27.5	35.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.7	4.4		26.8	18.9		18.9	13.0		33.3	1.5	
Delay (s)	59.3	38.7		54.9	53.6		44.9	51.2		60.9	36.8	
Level of Service	E	D		D	D		D	D		E	D	
Approach Delay (s)		41.4			53.7			49.7			43.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		

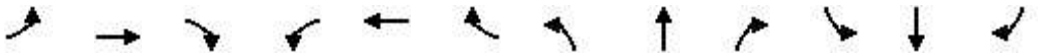
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	169	48	40	236	31	100	528	40	21	650	392
Future Volume (vph)	305	169	48	40	236	31	100	528	40	21	650	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1781		1750	1810		1750	3463		1750	3302	
Flt Permitted	0.21	1.00		0.61	1.00		0.08	1.00		0.38	1.00	
Satd. Flow (perm)	393	1781		1122	1810		156	3463		698	3302	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	339	188	53	44	262	34	111	587	44	23	722	436
RTOR Reduction (vph)	0	10	0	0	4	0	0	4	0	0	79	0
Lane Group Flow (vph)	339	231	0	44	292	0	111	627	0	23	1079	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.7	42.7		20.7	20.7		55.4	48.7		47.1	44.4	
Effective Green, g (s)	42.7	42.7		20.7	20.7		55.4	48.7		47.1	44.4	
Actuated g/C Ratio	0.39	0.39		0.19	0.19		0.50	0.44		0.43	0.40	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	374	690		210	340		179	1531		324	1331	
v/s Ratio Prot	c0.15	0.13			0.16		c0.04	0.18		0.00	c0.33	
v/s Ratio Perm	c0.20			0.04			0.27			0.03		
v/c Ratio	0.91	0.34		0.21	0.86		0.62	0.41		0.07	0.81	
Uniform Delay, d1	27.2	23.7		37.8	43.3		20.5	20.9		18.3	29.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.7	0.3		0.5	18.9		6.5	0.8		0.1	5.4	
Delay (s)	51.9	24.0		38.3	62.1		27.1	21.7		18.4	34.6	
Level of Service	D	C		D	E		C	C		B	C	
Approach Delay (s)		40.3			59.0			22.5			34.2	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

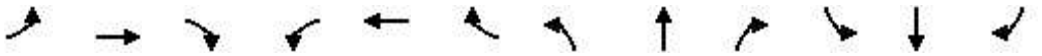
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	52	20	306	162	75	17	529	264	76	747	55
Future Volume (vph)	21	52	20	306	162	75	17	529	264	76	747	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1755		1750	3325		1750	3464	
Flt Permitted	0.60	1.00		0.47	1.00		0.26	1.00		0.22	1.00	
Satd. Flow (perm)	1096	1766		869	1755		472	3325		413	3464	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	24	58	22	344	182	84	19	594	297	85	839	62
RTOR Reduction (vph)	0	14	0	0	17	0	0	49	0	0	4	0
Lane Group Flow (vph)	24	66	0	344	249	0	19	842	0	85	897	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.1	8.1		30.3	30.3		49.4	46.8		54.6	49.4	
Effective Green, g (s)	8.1	8.1		30.3	30.3		49.4	46.8		54.6	49.4	
Actuated g/C Ratio	0.08	0.08		0.31	0.31		0.50	0.48		0.56	0.50	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	145		430	540		271	1583		300	1740	
v/s Ratio Prot		0.04		c0.15	0.14		0.00	0.25		c0.01	c0.26	
v/s Ratio Perm	0.02			c0.10			0.03			0.14		
v/c Ratio	0.27	0.46		0.80	0.46		0.07	0.53		0.28	0.52	
Uniform Delay, d1	42.3	43.0		29.4	27.4		12.7	18.1		11.5	16.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	2.3		10.2	0.6		0.1	1.3		0.5	1.1	
Delay (s)	43.9	45.3		39.6	28.0		12.8	19.3		12.0	17.5	
Level of Service	D	D		D	C		B	B		B	B	
Approach Delay (s)		45.0			34.6			19.2			17.0	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	98.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

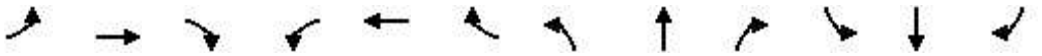
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	643	205	39	1174	187	217	386	19	272	698	93
Future Volume (vph)	77	643	205	39	1174	187	217	386	19	272	698	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3373		1750	3424		1750	3476		1750	3438	
Flt Permitted	0.09	1.00		0.18	1.00		0.13	1.00		0.43	1.00	
Satd. Flow (perm)	160	3373		329	3424		236	3476		794	3438	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	82	684	218	41	1186	199	231	411	20	289	743	99
RTOR Reduction (vph)	0	25	0	0	11	0	0	3	0	0	8	0
Lane Group Flow (vph)	82	877	0	41	1374	0	231	428	0	289	834	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	51.6	46.1		51.6	46.1		48.1	36.1		46.1	35.1	
Effective Green, g (s)	51.6	46.1		51.6	46.1		48.1	36.1		46.1	35.1	
Actuated g/C Ratio	0.43	0.39		0.43	0.39		0.41	0.30		0.39	0.30	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	143	1309		208	1329		248	1057		396	1016	
v/s Ratio Prot	c0.03	0.26		0.01	c0.40		c0.09	0.12		0.07	0.24	
v/s Ratio Perm	0.22			0.08			c0.28			0.22		
v/c Ratio	0.57	0.67		0.20	1.03		0.93	0.41		0.73	0.82	
Uniform Delay, d1	27.7	30.0		21.2	36.3		27.5	32.8		28.1	38.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.5	1.3		0.5	33.8		38.8	1.2		6.6	7.4	
Delay (s)	33.2	31.3		21.7	70.1		66.3	33.9		34.7	46.3	
Level of Service	C	C		C	E		E	C		C	D	
Approach Delay (s)		31.5			68.8			45.2			43.3	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	118.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		

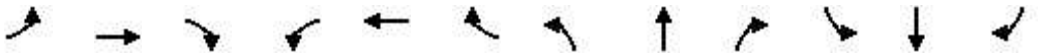
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	941	41	124	354	111	57	218	221	190	250	156
Future Volume (vph)	174	941	41	124	354	111	57	218	221	190	250	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3478		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.45	1.00		0.13	1.00	1.00	0.59	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	831	3478		235	3500	1566	1088	1842	1566	883	1842	1566
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	191	1034	45	136	389	122	63	240	243	209	275	171
RTOR Reduction (vph)	0	3	0	0	0	83	0	0	163	0	0	99
Lane Group Flow (vph)	191	1076	0	136	389	39	63	240	80	209	275	72
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	41.9	33.1		38.3	31.3	31.3	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	41.9	33.1		38.3	31.3	31.3	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.42	0.33		0.39	0.32	0.32	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	432	1161		197	1105	494	340	576	489	435	780	663
v/s Ratio Prot	c0.04	c0.31		c0.05	0.11			0.13		c0.03	0.15	
v/s Ratio Perm	0.15			0.22		0.02	0.06		0.05	c0.17		0.05
v/c Ratio	0.44	0.93		0.69	0.35	0.08	0.19	0.42	0.16	0.48	0.35	0.11
Uniform Delay, d1	18.7	31.8		23.3	26.1	23.8	24.8	26.9	24.7	19.6	19.3	17.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	12.4		10.0	0.2	0.1	1.2	2.2	0.7	0.8	1.3	0.3
Delay (s)	19.4	44.2		33.3	26.3	23.8	26.0	29.1	25.4	20.4	20.6	17.6
Level of Service	B	D		C	C	C	C	C	C	C	C	B
Approach Delay (s)		40.5			27.3			27.1			19.7	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	99.1	Sum of lost time (s)	21.0
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

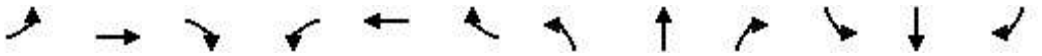
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1259	45	18	620	1	4	0	14	1	0	1
Future Volume (vph)	1	1259	45	18	620	1	4	0	14	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	5003		1750	5028		1750	1566		3395	1566	
Flt Permitted	0.38	1.00		0.16	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)	696	5003		296	5028		1842	1566		3574	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	1399	50	20	689	1	4	0	16	1	0	1
RTOR Reduction (vph)	0	2	0	0	0	0	0	16	0	0	1	0
Lane Group Flow (vph)	1	1447	0	20	690	0	4	0	0	1	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Effective Green, g (s)	65.6	64.5		65.6	64.5		3.2	1.6		2.2	1.1	
Actuated g/C Ratio	0.74	0.73		0.74	0.73		0.04	0.02		0.02	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	530	3654		238	3672		65	28		86	19	
v/s Ratio Prot	0.00	c0.29		c0.00	0.14		c0.00	0.00		0.00	0.00	
v/s Ratio Perm	0.00			0.06			c0.00			0.00		
v/c Ratio	0.00	0.40		0.08	0.19		0.06	0.01		0.01	0.00	
Uniform Delay, d1	2.9	4.5		3.0	3.7		41.1	42.6		42.0	43.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.2	0.1		0.4	0.1		0.1	0.0	
Delay (s)	2.9	4.8		3.2	3.8		41.5	42.7		42.1	43.1	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		4.8			3.8			42.5			42.6	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	970	133	248	600	133	89	217	159	266	478	82
Future Volume (vph)	105	970	133	248	600	133	89	217	159	266	478	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4938		1750	4892		1750	3278		1750	3423	
Flt Permitted	0.34	1.00		0.12	1.00		0.40	1.00		0.40	1.00	
Satd. Flow (perm)	628	4938		217	4892		730	3278		741	3423	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	108	1000	137	256	619	137	92	224	164	274	493	85
RTOR Reduction (vph)	0	18	0	0	35	0	0	119	0	0	13	0
Lane Group Flow (vph)	108	1119	0	256	721	0	92	269	0	274	565	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.0	30.0		45.9	34.9		33.4	27.8		42.7	33.1	
Effective Green, g (s)	37.0	30.0		45.9	34.9		33.4	27.8		42.7	33.1	
Actuated g/C Ratio	0.37	0.30		0.46	0.35		0.33	0.28		0.42	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	309	1472		280	1697		299	905		423	1126	
v/s Ratio Prot	0.02	0.23		c0.11	0.15		0.02	0.08		c0.07	0.16	
v/s Ratio Perm	0.10			c0.31			0.08			c0.20		
v/c Ratio	0.35	0.76		0.91	0.42		0.31	0.30		0.65	0.50	
Uniform Delay, d1	21.4	32.0		24.4	25.2		23.7	28.7		20.1	27.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	2.4		32.1	0.2		0.6	0.8		3.4	1.6	
Delay (s)	22.1	34.4		56.5	25.3		24.3	29.5		23.5	28.7	
Level of Service	C	C		E	C		C	C		C	C	
Approach Delay (s)		33.3			33.2			28.5			27.0	
Approach LOS		C			C			C			C	

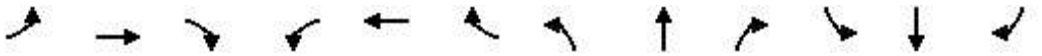
Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	164	62	21	83	23	30	447	18	14	380	201
Future Volume (vph)	315	164	62	21	83	23	30	447	18	14	380	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1767		1750	1782		1750	3480		1750	3318	
Flt Permitted	0.47	1.00		0.61	1.00		0.36	1.00		0.47	1.00	
Satd. Flow (perm)	865	1767		1125	1782		670	3480		872	3318	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	332	173	65	22	87	24	32	471	19	15	400	212
RTOR Reduction (vph)	0	15	0	0	12	0	0	2	0	0	59	0
Lane Group Flow (vph)	332	223	0	22	99	0	32	488	0	15	553	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.4	23.4		8.7	8.7		48.7	44.9		43.5	42.3	
Effective Green, g (s)	23.4	23.4		8.7	8.7		48.7	44.9		43.5	42.3	
Actuated g/C Ratio	0.27	0.27		0.10	0.10		0.57	0.53		0.51	0.49	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	347	483		114	181		429	1827		455	1641	
v/s Ratio Prot	c0.12	0.13			0.06		c0.00	0.14		0.00	c0.17	
v/s Ratio Perm	c0.14			0.02			0.04			0.02		
v/c Ratio	0.96	0.46		0.19	0.55		0.07	0.27		0.03	0.34	
Uniform Delay, d1	29.2	25.8		35.2	36.5		8.3	11.2		10.4	13.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.6	0.7		0.8	3.4		0.1	0.4		0.0	0.6	
Delay (s)	65.8	26.5		36.0	39.9		8.4	11.6		10.4	13.7	
Level of Service	E	C		D	D		A	B		B	B	
Approach Delay (s)		49.4			39.3			11.4			13.6	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

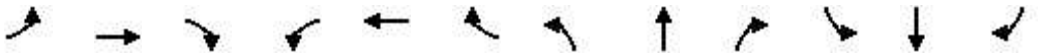
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	70	19	135	42	27	5	432	269	52	449	10
Future Volume (vph)	33	70	19	135	42	27	5	432	269	52	449	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.94		1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1783		1750	1734		1750	3299		1750	3488	
Flt Permitted	0.71	1.00		0.47	1.00		0.47	1.00		0.30	1.00	
Satd. Flow (perm)	1306	1783		872	1734		873	3299		556	3488	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	35	74	20	144	45	29	5	460	286	55	478	11
RTOR Reduction (vph)	0	11	0	0	22	0	0	83	0	0	1	0
Lane Group Flow (vph)	35	83	0	144	52	0	5	663	0	55	488	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.5	8.5		20.9	20.9		51.3	50.0		59.3	54.0	
Effective Green, g (s)	8.5	8.5		20.9	20.9		51.3	50.0		59.3	54.0	
Actuated g/C Ratio	0.09	0.09		0.23	0.23		0.56	0.54		0.64	0.59	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	164		277	393		498	1789		426	2042	
v/s Ratio Prot		0.05		c0.05	0.03		0.00	c0.20		c0.01	0.14	
v/s Ratio Perm	0.03			c0.07			0.01			0.08		
v/c Ratio	0.29	0.51		0.52	0.13		0.01	0.37		0.13	0.24	
Uniform Delay, d1	39.0	39.9		30.1	28.4		9.1	12.1		6.6	9.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	2.5		1.6	0.2		0.0	0.6		0.1	0.3	
Delay (s)	40.4	42.3		31.8	28.6		9.1	12.7		6.8	9.5	
Level of Service	D	D		C	C		A	B		A	A	
Approach Delay (s)		41.8			30.7			12.7			9.2	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

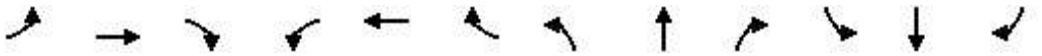
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	746	137	32	374	137	122	362	11	261	363	25
Future Volume (vph)	98	746	137	32	374	137	122	362	11	261	363	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3419		1750	3359		1750	3484		1750	3466	
Flt Permitted	0.30	1.00		0.16	1.00		0.51	1.00		0.45	1.00	
Satd. Flow (perm)	545	3419		287	3359		936	3484		831	3466	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	105	802	147	34	402	147	131	389	12	281	390	27
RTOR Reduction (vph)	0	15	0	0	38	0	0	2	0	0	5	0
Lane Group Flow (vph)	105	934	0	34	511	0	131	399	0	281	412	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.7	27.2		29.7	25.7		43.3	36.3		48.9	39.1	
Effective Green, g (s)	32.7	27.2		29.7	25.7		43.3	36.3		48.9	39.1	
Actuated g/C Ratio	0.34	0.28		0.31	0.26		0.45	0.37		0.50	0.40	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	251	955		147	887		475	1299		510	1392	
v/s Ratio Prot	c0.02	c0.27		0.01	0.15		0.02	0.11		c0.06	0.12	
v/s Ratio Perm	0.12			0.06			0.10			c0.22		
v/c Ratio	0.42	0.98		0.23	0.58		0.28	0.31		0.55	0.30	
Uniform Delay, d1	23.3	34.8		25.9	31.1		16.2	21.6		14.5	19.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	23.6		0.8	0.9		0.3	0.6		1.3	0.5	
Delay (s)	24.4	58.3		26.8	32.0		16.5	22.2		15.8	20.3	
Level of Service	C	E		C	C		B	C		B	C	
Approach Delay (s)		54.9			31.7			20.8			18.5	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	97.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

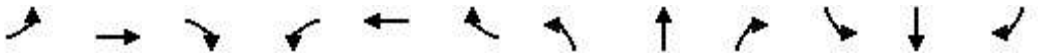
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	598	28	276	1177	375	81	351	218	188	341	298
Future Volume (vph)	143	598	28	276	1177	375	81	351	218	188	341	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3476		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.14	1.00		0.23	1.00	1.00	0.55	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	253	3476		422	3500	1566	1013	1842	1566	592	1842	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	147	616	29	285	1213	387	84	362	225	194	352	307
RTOR Reduction (vph)	0	4	0	0	0	240	0	0	113	0	0	124
Lane Group Flow (vph)	147	641	0	285	1213	147	84	362	112	194	352	183
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	36.1	29.1		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	36.1	29.1		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.36	0.29		0.45	0.34	0.34	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	1011		347	1190	532	314	571	485	329	773	657
v/s Ratio Prot	0.05	0.18		c0.10	c0.35			0.20		c0.04	0.19	
v/s Ratio Perm	0.22			0.27		0.09	0.08		0.07	c0.21		0.12
v/c Ratio	0.75	0.63		0.82	1.02	0.28	0.27	0.63	0.23	0.59	0.46	0.28
Uniform Delay, d1	25.7	30.8		19.8	33.0	24.0	26.0	29.6	25.6	20.5	20.8	19.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.8	1.3		14.4	31.0	0.3	2.1	5.3	1.1	2.7	1.9	1.1
Delay (s)	40.6	32.1		34.2	64.0	24.3	28.0	34.9	26.7	23.2	22.7	20.1
Level of Service	D	C		C	E	C	C	C	C	C	C	C
Approach Delay (s)		33.7			51.4			31.3			21.9	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		

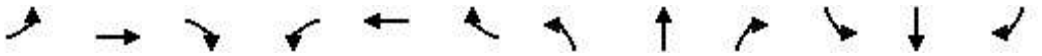
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	968	42	4	1750	8	75	0	17	2	0	2
Future Volume (vph)	3	968	42	4	1750	8	75	0	17	2	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4998		1750	5026		1750	1566		3395	1566	
Flt Permitted	0.09	1.00		0.25	1.00		0.78	1.00		1.00	1.00	
Satd. Flow (perm)	159	4998		451	5026		1445	1566		3574	1566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	1019	44	4	1842	8	79	0	18	2	0	2
RTOR Reduction (vph)	0	3	0	0	0	0	0	16	0	0	2	0
Lane Group Flow (vph)	3	1060	0	4	1850	0	79	2	0	2	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	58.9	57.8		58.9	57.8		14.3	9.2		2.2	1.1	
Effective Green, g (s)	58.9	57.8		58.9	57.8		14.3	9.2		2.2	1.1	
Actuated g/C Ratio	0.66	0.65		0.66	0.65		0.16	0.10		0.02	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	124	3238		313	3256		263	161		85	19	
v/s Ratio Prot	c0.00	0.21		0.00	c0.37		c0.03	0.00		0.00	0.00	
v/s Ratio Perm	0.02			0.01			c0.02			0.00		
v/c Ratio	0.02	0.33		0.01	0.57		0.30	0.01		0.02	0.00	
Uniform Delay, d1	6.1	7.0		5.2	8.7		32.9	35.9		42.5	43.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.0	0.7		0.6	0.0		0.1	0.0	
Delay (s)	6.2	7.3		5.2	9.5		33.6	35.9		42.6	43.5	
Level of Service	A	A		A	A		C	D		D	D	
Approach Delay (s)		7.3			9.5			34.0			43.1	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

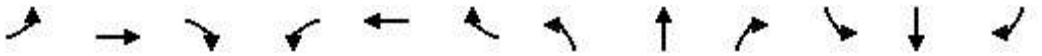
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	1025	175	250	1301	401	272	652	206	218	475	103
Future Volume (vph)	181	1025	175	250	1301	401	272	652	206	218	475	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4919		1750	4851		1750	3374		1750	3406	
Flt Permitted	0.11	1.00		0.10	1.00		0.19	1.00		0.14	1.00	
Satd. Flow (perm)	195	4919		176	4851		356	3374		257	3406	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	193	1090	186	266	1384	427	289	694	219	232	505	110
RTOR Reduction (vph)	0	19	0	0	46	0	0	25	0	0	15	0
Lane Group Flow (vph)	193	1257	0	266	1765	0	289	888	0	232	600	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	47.8	37.8		58.0	44.0		49.0	32.0		42.4	28.7	
Effective Green, g (s)	47.8	37.8		58.0	44.0		49.0	32.0		42.4	28.7	
Actuated g/C Ratio	0.40	0.32		0.48	0.37		0.41	0.27		0.35	0.24	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	207	1553		298	1783		343	901		261	816	
v/s Ratio Prot	0.08	0.26		c0.12	c0.36		c0.12	c0.26		0.10	0.18	
v/s Ratio Perm	0.29			0.31			0.22			0.21		
v/c Ratio	0.93	0.81		0.89	0.99		0.84	0.99		0.89	0.74	
Uniform Delay, d1	29.3	37.6		33.0	37.6		27.0	43.6		31.4	42.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	43.7	4.7		26.7	19.0		16.9	26.2		28.4	3.5	
Delay (s)	73.0	42.3		59.7	56.7		43.9	69.9		59.8	45.5	
Level of Service	E	D		E	E		D	E		E	D	
Approach Delay (s)		46.3			57.1			63.6			49.4	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		

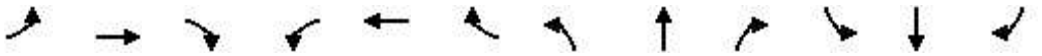
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	320	178	51	42	248	33	105	552	42	22	665	402
Future Volume (vph)	320	178	51	42	248	33	105	552	42	22	665	402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1780		1750	1809		1750	3463		1750	3302	
Flt Permitted	0.19	1.00		0.60	1.00		0.09	1.00		0.34	1.00	
Satd. Flow (perm)	356	1780		1108	1809		158	3463		633	3302	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	356	198	57	47	276	37	117	613	47	24	739	447
RTOR Reduction (vph)	0	10	0	0	5	0	0	5	0	0	81	0
Lane Group Flow (vph)	356	245	0	47	308	0	117	655	0	24	1105	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.2	43.2		21.2	21.2		53.5	46.5		47.7	43.6	
Effective Green, g (s)	43.2	43.2		21.2	21.2		53.5	46.5		47.7	43.6	
Actuated g/C Ratio	0.39	0.39		0.19	0.19		0.49	0.42		0.43	0.40	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	368	700		213	349		178	1466		316	1311	
v/s Ratio Prot	c0.16	0.14			0.17		c0.04	0.19		0.00	c0.33	
v/s Ratio Perm	c0.22			0.04			0.28			0.03		
v/c Ratio	0.97	0.35		0.22	0.88		0.66	0.45		0.08	0.84	
Uniform Delay, d1	27.3	23.4		37.3	43.1		21.5	22.5		18.0	30.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	37.9	0.3		0.5	22.1		8.5	1.0		0.1	6.7	
Delay (s)	65.2	23.7		37.9	65.2		30.0	23.5		18.1	36.7	
Level of Service	E	C		D	E		C	C		B	D	
Approach Delay (s)		47.9			61.7			24.5			36.4	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	109.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

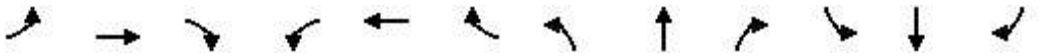
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	54	21	321	170	77	17	540	270	77	764	56
Future Volume (vph)	22	54	21	321	170	77	17	540	270	77	764	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1764		1750	1756		1750	3325		1750	3464	
Flt Permitted	0.59	1.00		0.47	1.00		0.25	1.00		0.22	1.00	
Satd. Flow (perm)	1085	1764		869	1756		454	3325		397	3464	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	25	61	24	361	191	87	19	607	303	87	858	63
RTOR Reduction (vph)	0	15	0	0	17	0	0	49	0	0	4	0
Lane Group Flow (vph)	25	70	0	361	261	0	19	861	0	87	917	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.2	8.2		30.7	30.7		49.4	46.8		54.6	49.4	
Effective Green, g (s)	8.2	8.2		30.7	30.7		49.4	46.8		54.6	49.4	
Actuated g/C Ratio	0.08	0.08		0.31	0.31		0.50	0.47		0.55	0.50	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	146		435	546		261	1576		290	1733	
v/s Ratio Prot		0.04		c0.16	0.15		0.00	0.26		c0.02	c0.26	
v/s Ratio Perm	0.02			c0.10			0.03			0.15		
v/c Ratio	0.28	0.48		0.83	0.48		0.07	0.55		0.30	0.53	
Uniform Delay, d1	42.5	43.2		29.6	27.5		12.9	18.4		11.8	16.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	2.5		12.4	0.7		0.1	1.4		0.6	1.2	
Delay (s)	44.2	45.7		42.0	28.2		13.0	19.8		12.4	17.9	
Level of Service	D	D		D	C		B	B		B	B	
Approach Delay (s)		45.4			36.0			19.6			17.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	676	215	41	1234	197	222	394	20	279	714	95
Future Volume (vph)	81	676	215	41	1234	197	222	394	20	279	714	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3373		1750	3424		1750	3475		1750	3438	
Flt Permitted	0.07	1.00		0.25	1.00		0.11	1.00		0.38	1.00	
Satd. Flow (perm)	129	3373		469	3424		210	3475		709	3438	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	719	229	44	1246	210	236	419	21	297	760	101
RTOR Reduction (vph)	0	23	0	0	11	0	0	3	0	0	8	0
Lane Group Flow (vph)	86	925	0	44	1445	0	236	437	0	297	853	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	64.0	64.0		53.0	53.0		50.0	35.1		49.8	35.0	
Effective Green, g (s)	64.0	64.0		53.0	53.0		50.0	35.1		49.8	35.0	
Actuated g/C Ratio	0.49	0.49		0.41	0.41		0.38	0.27		0.38	0.27	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	150	1661		191	1397		257	938		390	926	
v/s Ratio Prot	0.03	c0.27			c0.42		c0.11	0.13		0.09	c0.25	
v/s Ratio Perm	0.25			0.09			0.25			0.21		
v/c Ratio	0.57	0.56		0.23	1.03		0.92	0.47		0.76	0.92	
Uniform Delay, d1	28.9	23.0		25.1	38.5		34.8	39.6		30.9	46.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.2	0.4		0.6	33.5		34.7	1.7		8.5	15.7	
Delay (s)	34.1	23.4		25.7	71.9		69.5	41.2		39.4	61.8	
Level of Service	C	C		C	E		E	D		D	E	
Approach Delay (s)		24.3			70.6			51.1			56.1	
Approach LOS		C			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	129.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	R	L	T	R
Maximum Queue (m)	67.0	124.6	118.2	39.7	36.4	40.9	23.0	56.0	37.9	51.6	55.4	42.3
Average Queue (m)	20.7	70.9	67.5	15.8	19.0	21.5	7.4	23.4	11.1	24.3	24.4	7.4
95th Queue (m)	48.7	107.1	103.4	30.5	33.5	36.9	17.9	45.0	25.3	45.3	47.9	24.0
Link Distance (m)		319.7	319.7		232.1	232.1		210.3			335.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	80.0			50.0			60.0		30.0	50.0		30.0
Storage Blk Time (%)		6		0				5	0	0	6	0
Queuing Penalty (veh)		9		0				14	1	2	19	0

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	3.2	37.6	42.3	45.7	9.2	32.1	19.8	15.2	6.6	7.8	4.8	7.3
Average Queue (m)	0.1	9.1	11.0	11.6	1.9	5.3	2.4	1.1	0.5	2.8	0.2	0.5
95th Queue (m)	1.6	28.9	34.8	34.2	7.6	19.9	11.2	6.9	3.7	8.7	2.0	3.7
Link Distance (m)		218.9	218.9	218.9						126.7		81.4
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0				30.0				30.0		40.0	
Storage Blk Time (%)		0				0						
Queuing Penalty (veh)		0				0						

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	26.9	85.2	75.5	60.0	66.6	54.0	50.2	38.1	30.1	46.3	47.3	67.6
Average Queue (m)	12.4	50.5	41.4	26.9	35.7	28.2	21.7	14.6	14.1	21.8	20.0	35.2
95th Queue (m)	23.1	74.6	64.9	48.8	57.9	46.9	40.3	28.2	25.9	38.7	39.1	58.8
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0				80.0				80.0			140.0
Storage Blk Time (%)					0							
Queuing Penalty (veh)					0							

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	57.5	63.3
Average Queue (m)	31.4	29.1
95th Queue (m)	50.5	51.2
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	64.7	122.7	16.9	37.6	16.4	45.3	35.7	10.4	45.2	59.0
Average Queue (m)	39.5	36.4	4.6	16.4	5.1	22.4	15.0	2.2	18.5	27.1
95th Queue (m)	62.0	83.7	13.5	30.6	13.9	38.5	30.5	8.7	35.5	48.8
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)		0								
Queuing Penalty (veh)		0								
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	12	3	0	7		1			0	
Queuing Penalty (veh)	24	7	0	1		0			0	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	21.8	33.6	33.5	18.2	2.0	35.4	40.1	12.9	28.3	32.6
Average Queue (m)	5.3	12.5	15.6	6.0	0.2	10.2	14.3	2.8	6.2	8.9
95th Queue (m)	14.9	25.6	29.1	15.4	1.0	24.9	32.2	8.3	19.5	23.9
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)		0				0				
Queuing Penalty (veh)		0				0				

Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	67.4	99.1	89.1	17.5	61.9	56.9	39.8	46.9	45.7	59.6	43.7	36.6
Average Queue (m)	20.7	59.5	54.1	5.8	38.3	31.3	15.1	21.0	24.1	27.5	23.3	16.9
95th Queue (m)	46.5	86.4	80.1	15.3	58.2	53.4	30.1	39.5	42.4	48.7	39.9	32.9
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			70.0			60.0			70.0		
Storage Blk Time (%)	0	14			0					0		
Queuing Penalty (veh)	0	12			0					0		

Zone Summary

Zone wide Queuing Penalty: 92

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (m)	49.0	72.7	68.8	74.9	148.3	147.9	70.2	51.2	96.8	55.0	57.5	94.6
Average Queue (m)	20.0	45.2	42.4	51.4	83.1	85.9	7.6	12.8	44.9	19.9	24.9	36.0
95th Queue (m)	37.9	65.5	63.9	88.1	133.2	133.8	57.3	31.6	78.6	52.9	44.9	67.5
Link Distance (m)		319.7	319.7		232.1	232.1	232.1		210.3			335.0
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	80.0			50.0				60.0		30.0	50.0	
Storage Blk Time (%)		0		5	26				20	0	1	12
Queuing Penalty (veh)		0		29	68				54	1	5	54

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	SB
Directions Served	R
Maximum Queue (m)	54.9
Average Queue (m)	25.5
95th Queue (m)	50.8
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	5
Queuing Penalty (veh)	24

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	6.4	31.7	38.4	39.7	6.3	54.1	46.9	38.0	25.4	9.1	6.6	6.2
Average Queue (m)	0.4	11.4	12.4	14.5	0.3	31.0	21.1	15.0	11.3	2.7	0.5	0.6
95th Queue (m)	3.2	25.2	30.6	31.3	2.9	52.0	41.5	31.8	21.7	8.7	3.5	3.8
Link Distance (m)		218.9	218.9	218.9						126.7		81.4
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0				30.0				30.0		40.0	
Storage Blk Time (%)		0				5			0			
Queuing Penalty (veh)		0				0			0			

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	68.6	103.1	92.5	78.2	104.8	125.2	115.8	127.8	94.3	114.6	129.3	78.1
Average Queue (m)	31.3	63.6	56.9	44.5	52.1	85.2	76.5	75.5	47.1	69.9	74.4	37.1
95th Queue (m)	57.9	91.8	81.8	69.6	94.1	118.1	106.3	115.3	85.0	108.0	115.9	63.2
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0				80.0				80.0			140.0
Storage Blk Time (%)					1	10			1	6		
Queuing Penalty (veh)					5	23			2	14		

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	69.4	76.2
Average Queue (m)	42.0	39.9
95th Queue (m)	63.1	64.5
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	64.8	101.2	44.7	85.7	30.2	54.7	52.6	45.7	104.4	121.6
Average Queue (m)	42.6	37.8	13.4	44.4	15.1	31.5	26.0	5.6	57.2	74.2
95th Queue (m)	65.5	77.8	36.2	72.1	26.6	50.7	45.9	23.3	94.3	110.6
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	15	3	1	43	0	3			17	
Queuing Penalty (veh)	30	8	3	16	0	3			4	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	13.7	35.7	68.3	53.3	6.0	49.8	58.0	46.1	76.7	79.4
Average Queue (m)	2.6	12.3	38.2	21.5	0.7	19.5	23.4	7.5	27.9	31.7
95th Queue (m)	8.5	27.3	60.5	39.3	3.4	40.6	48.4	28.6	66.2	69.9
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)		1				1			4	
Queuing Penalty (veh)		0				0			3	

Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	60.4	96.2	88.9	94.8	231.9	220.1	72.1	62.8	62.0	94.7	107.9	113.0
Average Queue (m)	16.5	58.6	53.7	25.5	163.7	156.2	39.4	31.1	35.9	42.4	66.6	65.3
95th Queue (m)	39.3	84.5	78.2	86.0	258.8	253.8	67.4	52.1	55.2	72.1	96.5	97.6
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)					8	10						
Queuing Penalty (veh)					0	0						
Storage Bay Dist (m)	50.0			70.0			60.0			70.0		
Storage Blk Time (%)	0	11			46		4	0		0	7	
Queuing Penalty (veh)	0	8			17		7	0		1	18	

Zone Summary

Zone wide Queuing Penalty: 398

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	R	L	T	R
Maximum Queue (m)	81.5	108.9	111.2	41.8	41.6	43.9	28.3	62.7	43.8	53.8	77.2	40.7
Average Queue (m)	24.8	71.2	69.9	15.4	21.6	23.8	8.8	25.9	11.4	22.9	25.9	8.9
95th Queue (m)	55.6	101.9	100.7	31.1	36.6	39.5	20.4	49.9	27.5	43.8	52.8	26.5
Link Distance (m)		319.7	319.7		232.1	232.1		210.3			335.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	80.0			50.0			60.0		30.0	50.0		30.0
Storage Blk Time (%)		4			0			8	0	1	6	0
Queuing Penalty (veh)		8			0			22	1	3	20	0

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	1.6	36.8	49.5	50.7	9.3	29.1	16.9	11.6	8.2	11.5	4.9	4.7
Average Queue (m)	0.1	8.9	11.7	13.6	1.8	6.8	2.5	1.2	0.7	3.4	0.2	0.4
95th Queue (m)	1.6	27.0	36.4	37.8	7.3	21.9	10.2	6.4	4.3	9.8	2.1	3.1
Link Distance (m)		218.9	218.9	218.9						126.7		81.4
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0				30.0				30.0		40.0	
Storage Blk Time (%)		0				0						
Queuing Penalty (veh)		0				0						

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	38.7	91.0	72.9	56.5	77.6	71.7	50.9	40.7	30.7	49.5	58.9	85.5
Average Queue (m)	13.9	56.3	47.4	32.4	40.6	32.0	24.0	15.4	14.1	26.2	25.1	40.5
95th Queue (m)	26.7	81.6	69.6	53.5	65.1	55.4	43.2	30.6	26.4	44.0	47.5	69.2
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0				80.0				80.0			140.0
Storage Blk Time (%)					1							
Queuing Penalty (veh)					1							

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	59.1	62.1
Average Queue (m)	33.5	31.7
95th Queue (m)	52.7	54.1
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	64.6	105.2	18.4	46.2	19.6	49.1	41.3	11.9	45.0	61.4
Average Queue (m)	46.2	41.4	5.0	19.5	6.3	23.0	17.8	3.5	19.2	29.0
95th Queue (m)	68.7	83.4	13.7	37.0	16.1	40.4	34.6	11.0	36.8	50.0
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	20	4	1	11		1			1	
Queuing Penalty (veh)	46	12	1	2		0			0	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	21.1	40.9	41.5	25.5	2.0	35.8	48.3	14.2	30.4	33.3
Average Queue (m)	4.4	14.4	17.9	7.3	0.2	11.1	16.6	3.1	5.3	8.5
95th Queue (m)	12.9	31.5	34.1	18.6	1.1	26.5	37.8	9.4	18.6	23.9
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)		0				0			0	
Queuing Penalty (veh)		0				0			0	

Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	74.8	115.2	109.4	17.2	67.2	64.6	35.8	46.7	48.1	58.5	52.9	40.7
Average Queue (m)	24.4	70.0	62.2	6.3	38.1	30.5	15.7	21.4	24.8	29.0	24.9	17.8
95th Queue (m)	59.2	103.3	96.7	15.0	58.2	54.8	30.4	38.4	42.8	49.1	43.3	32.9
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			70.0			60.0			70.0		
Storage Blk Time (%)	0	23			0			0		0	0	
Queuing Penalty (veh)	0	22			0			0		0	0	

Zone Summary

Zone wide Queuing Penalty: 139

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (m)	57.3	87.2	85.7	74.9	186.1	187.9	130.3	84.1	136.6	55.0	65.0	106.8
Average Queue (m)	25.4	50.5	46.7	59.8	113.1	113.4	13.9	18.1	62.0	26.2	27.6	42.4
95th Queue (m)	46.7	75.2	73.8	93.8	187.5	186.2	78.2	50.4	114.4	63.7	49.6	78.0
Link Distance (m)		319.7	319.7		232.1	232.1	232.1		210.3			335.0
Upstream Blk Time (%)					0	0						
Queuing Penalty (veh)					1	1						
Storage Bay Dist (m)	80.0			50.0				60.0		30.0	50.0	
Storage Blk Time (%)	0	0		14	37				31	0	1	16
Queuing Penalty (veh)	0	1		85	103				94	0	7	77

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	SB
Directions Served	R
Maximum Queue (m)	55.0
Average Queue (m)	30.6
95th Queue (m)	57.3
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	6
Queuing Penalty (veh)	31

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	8.0	36.3	40.2	42.7	9.5	69.6	54.6	40.1	30.4	15.1	6.1	7.6
Average Queue (m)	0.7	12.6	14.8	15.6	0.7	35.3	25.3	16.4	12.7	3.0	0.5	0.4
95th Queue (m)	4.2	28.5	36.1	35.0	4.6	58.3	47.0	34.4	24.6	10.5	3.9	3.2
Link Distance (m)		218.9	218.9	218.9						126.7		81.4
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0				30.0				30.0		40.0	
Storage Blk Time (%)		0				6			0	0		
Queuing Penalty (veh)		0				0			0	0		

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	95.5	123.7	112.1	97.1	104.8	151.2	142.9	142.5	104.6	185.9	168.0	102.6
Average Queue (m)	43.2	75.4	67.1	52.5	63.2	98.3	89.5	90.2	63.5	94.6	97.7	54.3
95th Queue (m)	83.5	110.9	102.2	85.4	112.3	136.2	123.6	132.2	110.0	166.6	160.8	97.1
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0				80.0				80.0			140.0
Storage Blk Time (%)		0			2	16			2	17		
Queuing Penalty (veh)		0			9	41			6	46		

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	85.4	85.1
Average Queue (m)	52.0	50.9
95th Queue (m)	75.0	74.3
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	64.8	114.2	44.8	124.8	50.2	70.8	67.1	64.7	122.0	139.7
Average Queue (m)	46.7	44.0	16.3	64.1	19.7	39.0	33.2	6.7	67.4	84.0
95th Queue (m)	69.5	91.6	40.7	108.9	38.5	63.3	57.9	29.4	110.0	129.3
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				0						
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	19	4	4	57	1	8			21	
Queuing Penalty (veh)	44	14	11	24	3	9			5	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	14.5	32.7	90.2	73.5	7.4	65.9	76.4	47.2	83.4	89.0
Average Queue (m)	3.2	11.8	44.2	25.4	0.8	25.9	30.7	9.4	33.5	39.6
95th Queue (m)	10.0	24.5	70.0	51.6	4.0	51.7	61.2	30.2	74.9	81.7
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)		0	0			2		0	6	
Queuing Penalty (veh)		0	1			0		0	5	

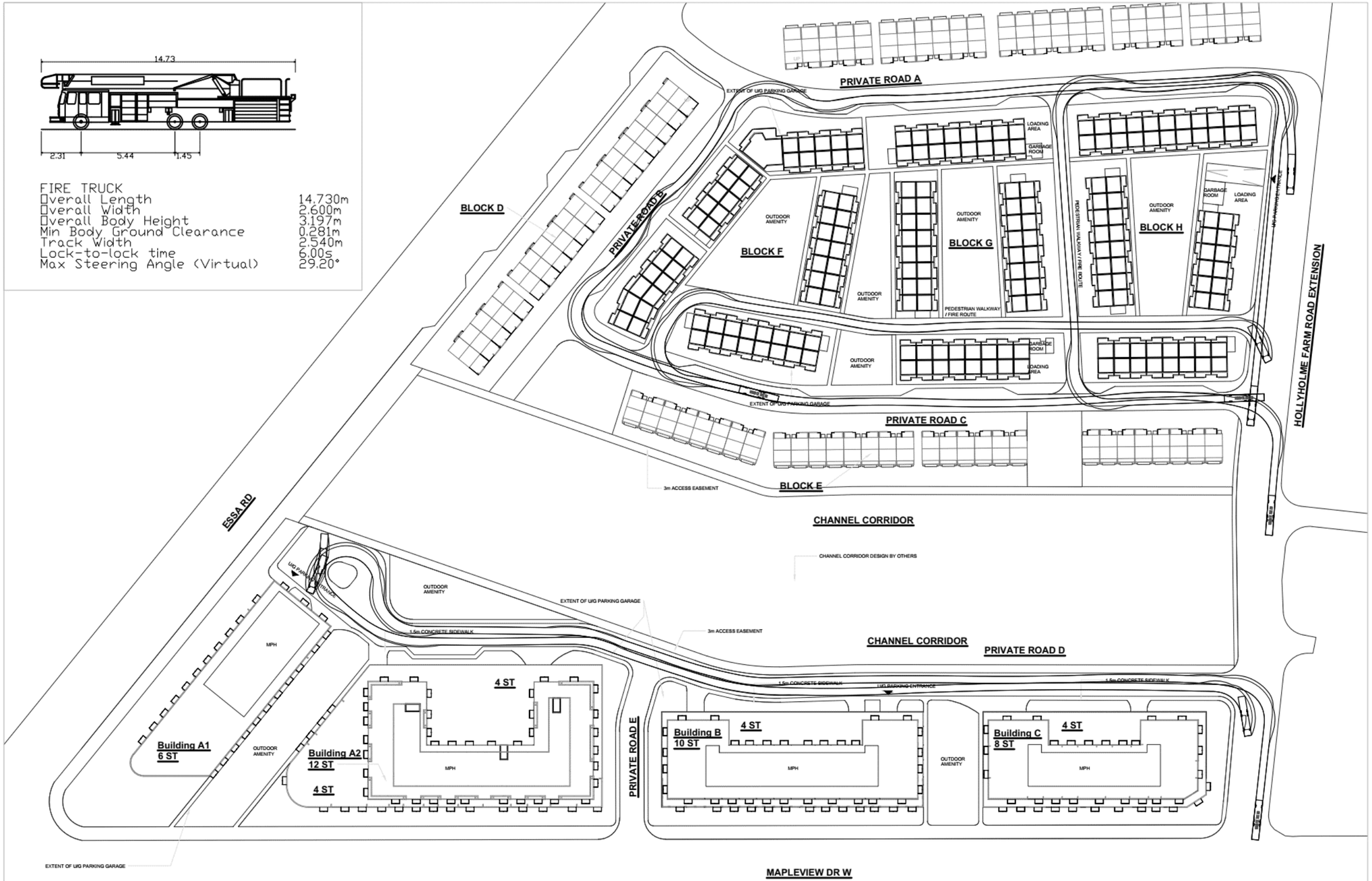
Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	67.8	91.2	95.0	94.8	254.1	257.1	84.1	95.1	85.5	94.8	145.9	131.4
Average Queue (m)	20.8	59.5	56.2	27.8	233.7	229.2	49.5	42.6	42.3	56.4	83.6	81.7
95th Queue (m)	45.9	84.9	84.6	89.2	280.5	284.7	84.1	84.9	72.1	97.7	123.1	118.7
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)					31	33						
Queuing Penalty (veh)					0	0						
Storage Bay Dist (m)	50.0			70.0			60.0			70.0		
Storage Blk Time (%)		12			58		12	0		6	15	
Queuing Penalty (veh)		10			24		24	1		21	42	

Zone Summary

Zone wide Queuing Penalty: 738

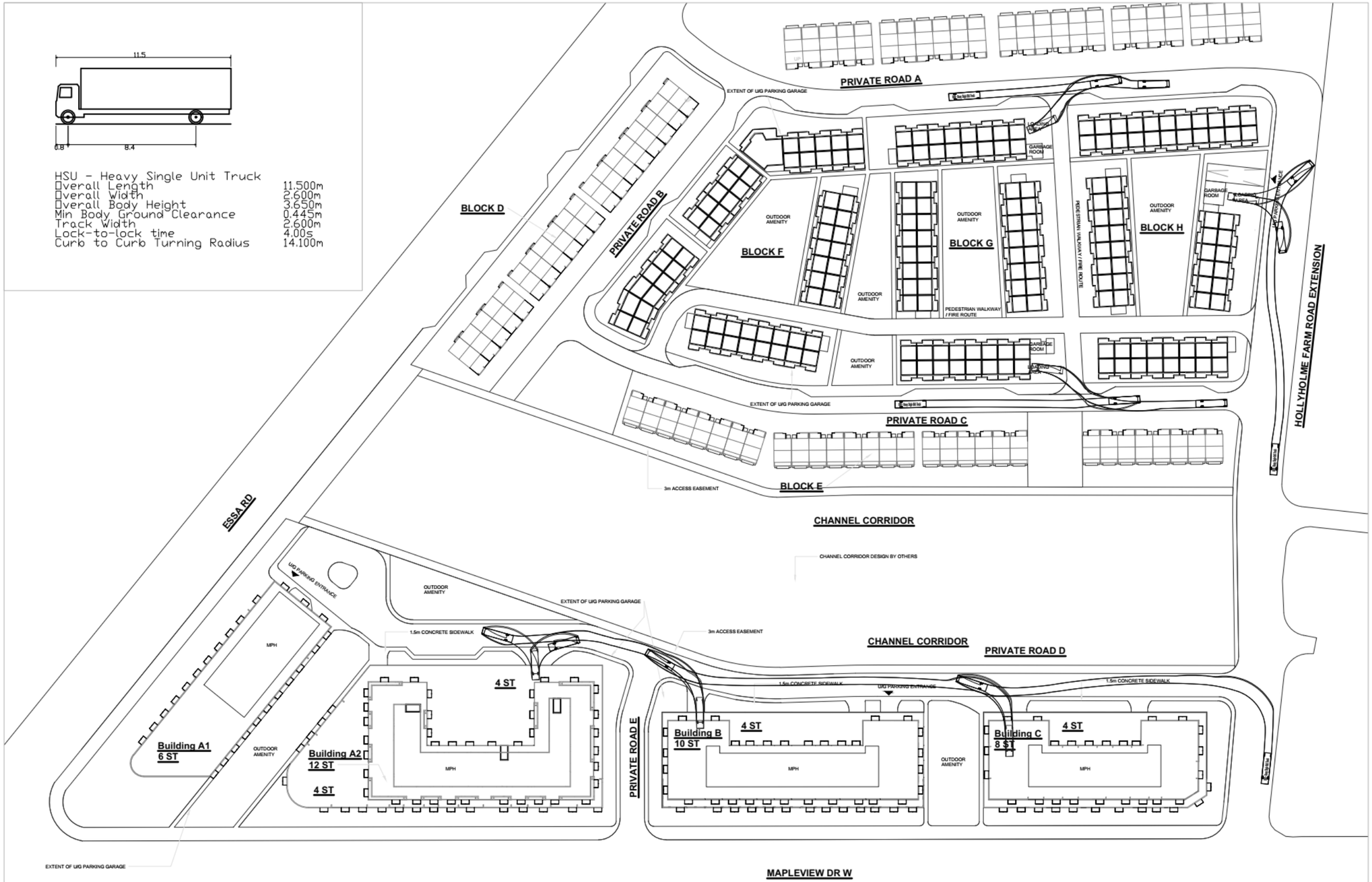
Appendix F:
Vehicle Turning Assessment



MAPLEVIEW & ESSA DEVELOPMENT

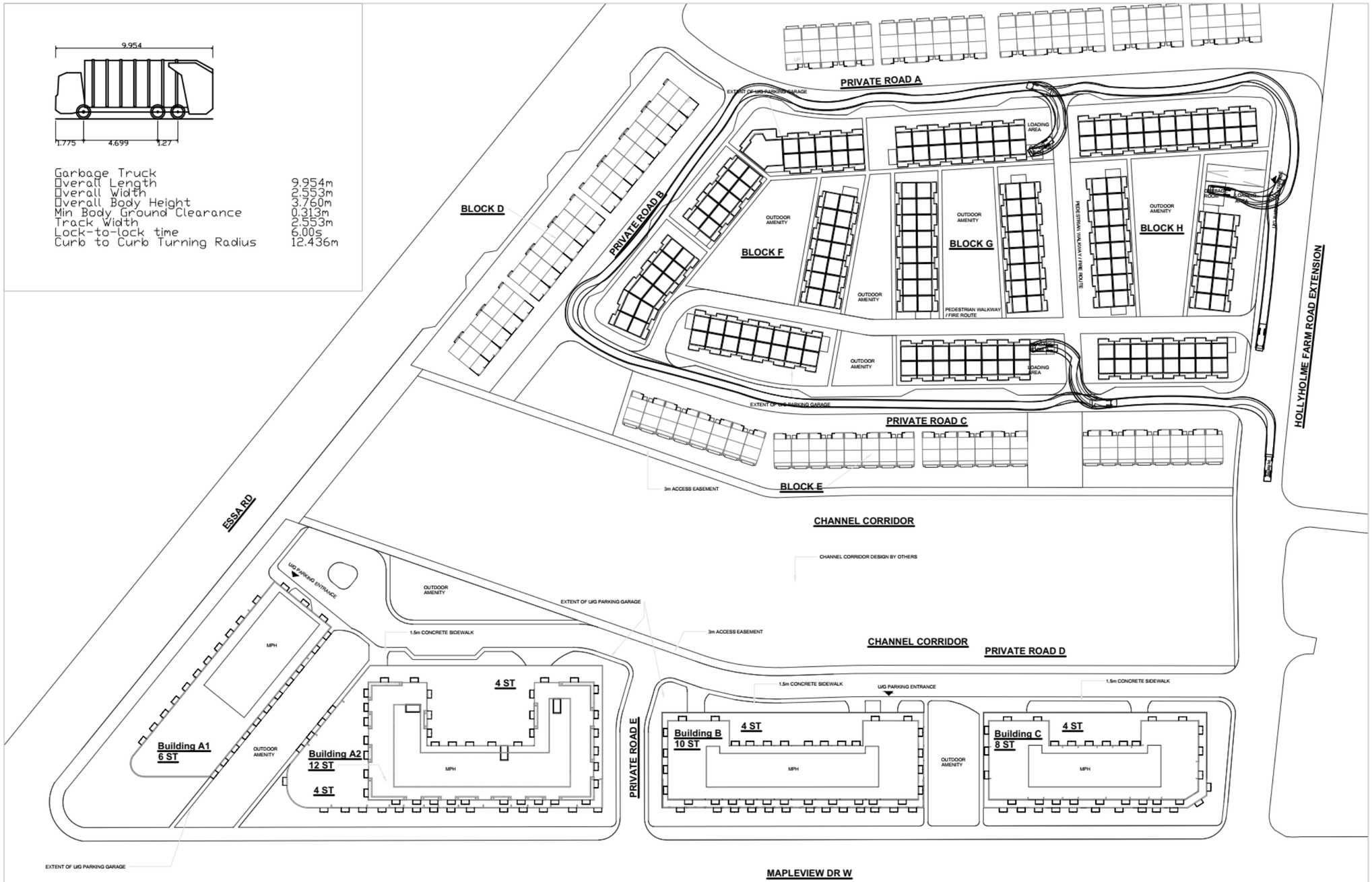
Figure F1: Fire Truck

Source:



MAPLEVIEW & ESSA DEVELOPMENT

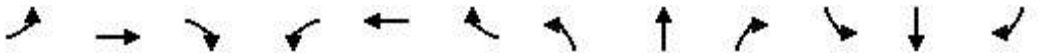
Figure F2: Single-Unit Truck



MAPLEVIEW & ESSA DEVELOPMENT

Figure F3: Garbage Truck

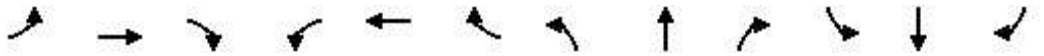
Appendix G:
Future Total Operations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	826	36	112	317	110	47	182	187	165	213	136
Future Volume (vph)	154	826	36	112	317	110	47	182	187	165	213	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3478		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.53	1.00		0.13	1.00	1.00	0.61	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	978	3478		236	3500	1566	1129	1842	1566	990	1842	1566
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	169	908	40	123	348	121	52	200	205	181	234	149
RTOR Reduction (vph)	0	3	0	0	0	82	0	0	139	0	0	85
Lane Group Flow (vph)	169	945	0	123	348	39	52	200	66	181	234	64
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	37.4	30.4		39.0	31.2	31.2	31.1	31.1	31.1	42.1	42.1	42.1
Effective Green, g (s)	37.4	30.4		39.0	31.2	31.2	31.1	31.1	31.1	42.1	42.1	42.1
Actuated g/C Ratio	0.38	0.31		0.40	0.32	0.32	0.32	0.32	0.32	0.43	0.43	0.43
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	431	1086		215	1122	502	360	588	500	483	797	677
v/s Ratio Prot	0.03	c0.27		c0.05	0.10			0.11		c0.03	0.13	
v/s Ratio Perm	0.12			0.18		0.02	0.05		0.04	c0.14		0.04
v/c Ratio	0.39	0.87		0.57	0.31	0.08	0.14	0.34	0.13	0.37	0.29	0.10
Uniform Delay, d1	20.4	31.6		21.4	24.9	23.0	23.6	25.3	23.5	17.6	17.9	16.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	7.6		3.6	0.2	0.1	0.8	1.6	0.5	0.5	0.9	0.3
Delay (s)	21.0	39.2		25.1	25.1	23.1	24.5	26.8	24.0	18.1	18.9	16.6
Level of Service	C	D		C	C	C	C	C	C	B	B	B
Approach Delay (s)		36.4			24.7			25.3			18.0	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	97.3	Sum of lost time (s)	21.0
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
Analysis Period (min)	15		

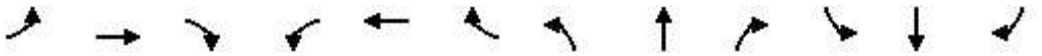
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1108	39	16	553	21	3	0	13	59	0	16
Future Volume (vph)	4	1108	39	16	553	21	3	0	13	59	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	5003		1750	5002		1750	1566		3395	1566	
Flt Permitted	0.40	1.00		0.19	1.00		1.00	1.00		0.71	1.00	
Satd. Flow (perm)	735	5003		353	5002		1842	1566		2553	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	1231	43	18	614	23	3	0	14	66	0	18
RTOR Reduction (vph)	0	2	0	0	2	0	0	14	0	0	17	0
Lane Group Flow (vph)	4	1272	0	18	635	0	3	0	0	66	1	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	59.0	57.9		59.0	57.9		3.2	1.6		11.6	6.0	
Effective Green, g (s)	59.0	57.9		59.0	57.9		3.2	1.6		11.6	6.0	
Actuated g/C Ratio	0.68	0.67		0.68	0.67		0.04	0.02		0.13	0.07	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	513	3344		258	3344		66	28		400	108	
v/s Ratio Prot	0.00	c0.25		c0.00	0.13		0.00	0.00		c0.01	0.00	
v/s Ratio Perm	0.01			0.05			0.00			c0.01		
v/c Ratio	0.01	0.38		0.07	0.19		0.05	0.01		0.17	0.01	
Uniform Delay, d1	4.4	6.4		4.5	5.4		40.3	41.7		33.1	37.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.1		0.3	0.1		0.2	0.0	
Delay (s)	4.4	6.7		4.7	5.6		40.5	41.9		33.3	37.6	
Level of Service	A	A		A	A		D	D		C	D	
Approach Delay (s)		6.7			5.5			41.6			34.2	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	86.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

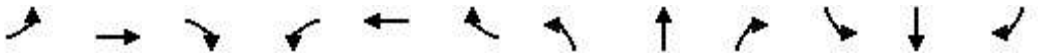
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	897	128	216	546	116	80	182	133	224	400	73
Future Volume (vph)	94	897	128	216	546	116	80	182	133	224	400	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4935		1750	4896		1750	3279		1750	3419	
Flt Permitted	0.38	1.00		0.14	1.00		0.41	1.00		0.51	1.00	
Satd. Flow (perm)	701	4935		259	4896		758	3279		933	3419	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	97	925	132	223	563	120	82	188	137	231	412	75
RTOR Reduction (vph)	0	20	0	0	34	0	0	97	0	0	15	0
Lane Group Flow (vph)	97	1037	0	223	649	0	82	228	0	231	472	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.5	30.9		45.3	35.7		33.5	27.9		36.3	29.3	
Effective Green, g (s)	36.5	30.9		45.3	35.7		33.5	27.9		36.3	29.3	
Actuated g/C Ratio	0.38	0.32		0.47	0.37		0.35	0.29		0.38	0.30	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	327	1585		283	1816		321	950		411	1041	
v/s Ratio Prot	0.02	0.21		c0.09	0.13		0.01	0.07		c0.04	0.14	
v/s Ratio Perm	0.10			c0.29			0.07			c0.17		
v/c Ratio	0.30	0.65		0.79	0.36		0.26	0.24		0.56	0.45	
Uniform Delay, d1	19.6	28.1		17.9	21.9		21.5	26.1		22.1	27.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.0		13.5	0.1		0.4	0.6		1.8	1.4	
Delay (s)	20.1	29.0		31.4	22.1		21.9	26.7		23.9	28.4	
Level of Service	C	C		C	C		C	C		C	C	
Approach Delay (s)		28.3			24.4			25.7			27.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	96.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

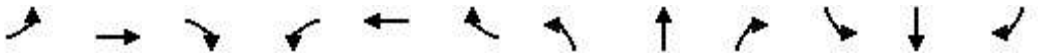
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	143	54	18	73	20	25	427	15	13	369	184
Future Volume (vph)	274	143	54	18	73	20	25	427	15	13	369	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1783		1750	3482		1750	3325	
Flt Permitted	0.47	1.00		0.63	1.00		0.39	1.00		0.48	1.00	
Satd. Flow (perm)	865	1766		1156	1783		725	3482		893	3325	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	288	151	57	19	77	21	26	449	16	14	388	194
RTOR Reduction (vph)	0	16	0	0	12	0	0	2	0	0	52	0
Lane Group Flow (vph)	288	192	0	19	86	0	26	463	0	14	530	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.1	23.1		8.4	8.4		45.2	42.7		42.6	41.4	
Effective Green, g (s)	23.1	23.1		8.4	8.4		45.2	42.7		42.6	41.4	
Actuated g/C Ratio	0.28	0.28		0.10	0.10		0.54	0.51		0.51	0.50	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	354	491		116	180		425	1791		470	1658	
v/s Ratio Prot	c0.10	0.11			0.05		c0.00	0.13		0.00	c0.16	
v/s Ratio Perm	c0.12			0.02			0.03			0.01		
v/c Ratio	0.81	0.39		0.16	0.48		0.06	0.26		0.03	0.32	
Uniform Delay, d1	26.4	24.3		34.1	35.2		8.8	11.3		9.9	12.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.3	0.5		0.7	2.0		0.1	0.4		0.0	0.5	
Delay (s)	39.7	24.8		34.8	37.2		8.9	11.6		9.9	12.9	
Level of Service	D	C		C	D		A	B		A	B	
Approach Delay (s)		33.4			36.8			11.5			12.8	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

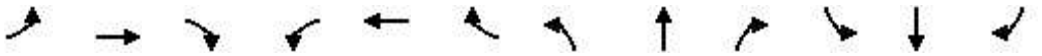
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	61	17	121	37	26	4	440	256	50	429	9
Future Volume (vph)	28	61	17	121	37	26	4	440	256	50	429	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.94		1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1782		1750	1727		1750	3307		1750	3489	
Flt Permitted	0.71	1.00		0.47	1.00		0.48	1.00		0.31	1.00	
Satd. Flow (perm)	1314	1782		874	1727		892	3307		564	3489	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	65	18	129	39	28	4	468	272	53	456	10
RTOR Reduction (vph)	0	11	0	0	22	0	0	71	0	0	1	0
Lane Group Flow (vph)	30	72	0	129	45	0	4	669	0	53	465	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.3	8.3		20.5	20.5		52.5	51.2		60.6	55.3	
Effective Green, g (s)	8.3	8.3		20.5	20.5		52.5	51.2		60.6	55.3	
Actuated g/C Ratio	0.09	0.09		0.22	0.22		0.56	0.55		0.65	0.59	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	117	158		269	380		514	1818		435	2072	
v/s Ratio Prot		0.04		c0.04	0.03		0.00	c0.20		c0.01	0.13	
v/s Ratio Perm	0.02			c0.06			0.00			0.07		
v/c Ratio	0.26	0.46		0.48	0.12		0.01	0.37		0.12	0.22	
Uniform Delay, d1	39.5	40.3		30.7	29.1		8.9	11.8		6.4	8.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	2.1		1.3	0.1		0.0	0.6		0.1	0.3	
Delay (s)	40.7	42.3		32.0	29.2		8.9	12.4		6.5	9.1	
Level of Service	D	D		C	C		A	B		A	A	
Approach Delay (s)		41.9			31.0			12.4			8.8	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	93.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	624	115	26	312	114	112	378	11	239	351	23
Future Volume (vph)	82	624	115	26	312	114	112	378	11	239	351	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3418		1750	3359		1750	3485		1750	3467	
Flt Permitted	0.36	1.00		0.17	1.00		0.52	1.00		0.45	1.00	
Satd. Flow (perm)	661	3418		315	3359		949	3485		825	3467	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	88	671	124	28	335	123	120	406	12	257	377	25
RTOR Reduction (vph)	0	16	0	0	38	0	0	2	0	0	5	0
Lane Group Flow (vph)	88	779	0	28	420	0	120	416	0	257	397	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	30.3	24.9		27.3	23.4		43.9	36.8		48.9	39.3	
Effective Green, g (s)	30.3	24.9		27.3	23.4		43.9	36.8		48.9	39.3	
Actuated g/C Ratio	0.32	0.26		0.29	0.25		0.46	0.39		0.51	0.41	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	272	893		149	825		497	1347		517	1431	
v/s Ratio Prot	c0.02	c0.23		0.01	0.12		0.02	0.12		c0.05	0.11	
v/s Ratio Perm	0.08			0.05			0.09			c0.21		
v/c Ratio	0.32	0.87		0.19	0.51		0.24	0.31		0.50	0.28	
Uniform Delay, d1	23.5	33.6		25.6	30.9		14.8	20.3		13.4	18.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	9.4		0.6	0.5		0.3	0.6		0.8	0.5	
Delay (s)	24.2	43.0		26.3	31.4		15.1	20.9		14.1	19.0	
Level of Service	C	D		C	C		B	C		B	B	
Approach Delay (s)		41.2			31.1			19.6			17.1	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	95.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1128	472	0	0	0
Future Volume (Veh/h)	0	1128	472	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1226	513	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		250	233			
pX, platoon unblocked					0.90	
vC, conflicting volume	513				922	171
vC1, stage 1 conf vol					513	
vC2, stage 2 conf vol					409	
vCu, unblocked vol	513				516	171
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1049				546	843

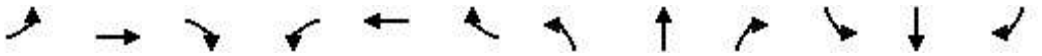
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	409	409	409	205	205	103	0
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.24	0.24	0.24	0.12	0.12	0.06	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							A
Approach Delay (s)	0.0			0.0			0.0
Approach LOS							A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	44	441	4	18	500
Future Volume (Veh/h)	14	44	441	4	18	500
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	48	479	4	20	543
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			359			
pX, platoon unblocked	0.96	0.96			0.96	
vC, conflicting volume	1064	481			483	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1046	439			441	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	92			98	
cM capacity (veh/h)	238	593			1075	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	63	483	20	543
Volume Left	15	0	20	0
Volume Right	48	4	0	0
cSH	438	1700	1075	1700
Volume to Capacity	0.14	0.28	0.02	0.32
Queue Length 95th (m)	3.8	0.0	0.4	0.0
Control Delay (s)	14.6	0.0	8.4	0.0
Lane LOS	B		A	
Approach Delay (s)	14.6	0.0	0.3	
Approach LOS	B			

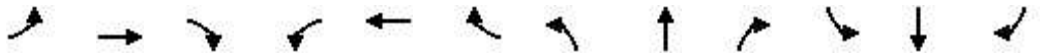
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	531	25	245	1034	340	66	295	186	164	285	250
Future Volume (vph)	133	531	25	245	1034	340	66	295	186	164	285	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3476		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.14	1.00		0.27	1.00	1.00	0.58	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	258	3476		503	3500	1566	1069	1842	1566	731	1842	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	137	547	26	253	1066	351	68	304	192	169	294	258
RTOR Reduction (vph)	0	4	0	0	0	234	0	0	113	0	0	126
Lane Group Flow (vph)	137	569	0	253	1066	117	68	304	79	169	294	132
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	35.6	28.6		44.1	33.1	33.1	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	35.6	28.6		44.1	33.1	33.1	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.36	0.29		0.45	0.33	0.33	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	198	1003		368	1169	523	334	576	489	381	780	663
v/s Ratio Prot	0.05	0.16		c0.08	c0.30			c0.17		c0.03	0.16	
v/s Ratio Perm	0.20			0.23		0.07	0.06		0.05	0.16		0.08
v/c Ratio	0.69	0.57		0.69	0.91	0.22	0.20	0.53	0.16	0.44	0.38	0.20
Uniform Delay, d1	24.4	30.0		18.9	31.6	23.8	25.0	28.0	24.6	18.9	19.6	18.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.0	0.7		5.3	10.7	0.2	1.4	3.4	0.7	0.8	1.4	0.7
Delay (s)	34.3	30.7		24.2	42.3	24.0	26.4	31.5	25.4	19.7	21.0	18.6
Level of Service	C	C		C	D	C	C	C	C	B	C	B
Approach Delay (s)		31.4			35.7			28.8			19.8	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	99.1	Sum of lost time (s)	21.0
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		

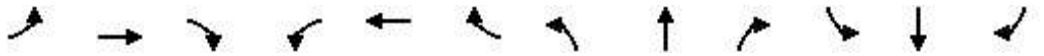
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	859	37	3	1540	67	65	0	15	39	0	12
Future Volume (vph)	11	859	37	3	1540	67	65	0	15	39	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4998		1750	4997		1750	1566		3395	1566	
Flt Permitted	0.11	1.00		0.28	1.00		0.98	1.00		1.00	1.00	
Satd. Flow (perm)	201	4998		524	4997		1797	1566		3574	1566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	904	39	3	1621	71	68	0	16	41	0	13
RTOR Reduction (vph)	0	3	0	0	3	0	0	15	0	0	13	0
Lane Group Flow (vph)	12	940	0	3	1689	0	68	1	0	41	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	58.9	57.8		58.9	57.8		12.5	4.1		6.5	1.1	
Effective Green, g (s)	58.9	57.8		58.9	57.8		12.5	4.1		6.5	1.1	
Actuated g/C Ratio	0.67	0.65		0.67	0.65		0.14	0.05		0.07	0.01	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	153	3267		364	3267		249	72		251	19	
v/s Ratio Prot	c0.00	0.19		0.00	c0.34		c0.03	0.00		0.01	0.00	
v/s Ratio Perm	0.05			0.01			c0.01			0.00		
v/c Ratio	0.08	0.29		0.01	0.52		0.27	0.01		0.16	0.01	
Uniform Delay, d1	5.6	6.5		4.9	8.0		33.9	40.2		38.5	43.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.0	0.6		0.6	0.1		0.3	0.2	
Delay (s)	5.8	6.7		4.9	8.6		34.5	40.3		38.8	43.3	
Level of Service	A	A		A	A		C	D		D	D	
Approach Delay (s)		6.7			8.6			35.6			39.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

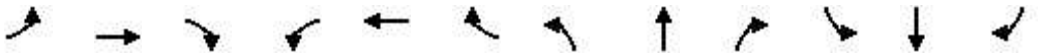
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	932	162	218	1191	351	242	547	172	184	399	92
Future Volume (vph)	162	932	162	218	1191	351	242	547	172	184	399	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4917		1750	4857		1750	3374		1750	3401	
Flt Permitted	0.12	1.00		0.11	1.00		0.30	1.00		0.15	1.00	
Satd. Flow (perm)	212	4917		202	4857		558	3374		281	3401	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	172	991	172	232	1267	373	257	582	183	196	424	98
RTOR Reduction (vph)	0	21	0	0	48	0	0	28	0	0	19	0
Lane Group Flow (vph)	172	1142	0	232	1592	0	257	737	0	196	503	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.6	34.7		52.0	39.1		39.3	26.8		38.1	26.2	
Effective Green, g (s)	43.6	34.7		52.0	39.1		39.3	26.8		38.1	26.2	
Actuated g/C Ratio	0.41	0.33		0.49	0.37		0.37	0.25		0.36	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	214	1599		291	1779		345	847		264	835	
v/s Ratio Prot	0.07	0.23		c0.10	c0.33		c0.09	c0.22		0.08	0.15	
v/s Ratio Perm	0.26			0.29			0.19			0.18		
v/c Ratio	0.80	0.71		0.80	0.90		0.74	0.87		0.74	0.60	
Uniform Delay, d1	24.2	31.6		23.2	31.9		25.5	38.3		26.5	35.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.2	2.8		14.0	7.5		8.5	9.7		10.7	1.2	
Delay (s)	43.4	34.4		37.2	39.3		34.0	48.0		37.3	36.9	
Level of Service	D	C		D	D		C	D		D	D	
Approach Delay (s)		35.6			39.1			44.5			37.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	106.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

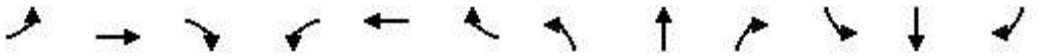
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	154	44	37	215	28	87	499	35	20	668	368
Future Volume (vph)	279	154	44	37	215	28	87	499	35	20	668	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1781		1750	1810		1750	3465		1750	3313	
Flt Permitted	0.27	1.00		0.62	1.00		0.10	1.00		0.40	1.00	
Satd. Flow (perm)	489	1781		1143	1810		184	3465		733	3313	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	310	171	49	41	239	31	97	554	39	22	742	409
RTOR Reduction (vph)	0	10	0	0	5	0	0	4	0	0	67	0
Lane Group Flow (vph)	310	210	0	41	265	0	97	589	0	22	1084	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.4	37.4		18.6	18.6		50.1	44.7		44.5	41.9	
Effective Green, g (s)	37.4	37.4		18.6	18.6		50.1	44.7		44.5	41.9	
Actuated g/C Ratio	0.37	0.37		0.18	0.18		0.50	0.44		0.44	0.42	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	366	661		211	334		175	1538		350	1378	
v/s Ratio Prot	c0.12	0.12			0.15		c0.03	0.17		0.00	c0.33	
v/s Ratio Perm	c0.19			0.04			0.25			0.03		
v/c Ratio	0.85	0.32		0.19	0.79		0.55	0.38		0.06	0.79	
Uniform Delay, d1	25.3	22.6		34.7	39.2		17.9	18.8		15.9	25.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.4	0.3		0.5	12.2		3.8	0.7		0.1	4.6	
Delay (s)	41.6	22.8		35.2	51.4		21.7	19.5		16.0	30.1	
Level of Service	D	C		D	D		C	B		B	C	
Approach Delay (s)		33.8			49.3			19.8			29.8	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

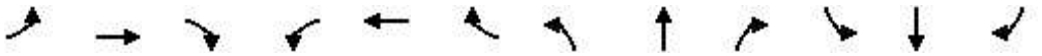
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	47	18	290	148	72	16	526	254	73	747	51
Future Volume (vph)	19	47	18	290	148	72	16	526	254	73	747	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1751		1750	3329		1750	3466	
Flt Permitted	0.61	1.00		0.47	1.00		0.27	1.00		0.24	1.00	
Satd. Flow (perm)	1116	1766		864	1751		497	3329		438	3466	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	21	53	20	326	166	81	18	591	285	82	839	57
RTOR Reduction (vph)	0	16	0	0	20	0	0	50	0	0	4	0
Lane Group Flow (vph)	21	57	0	326	227	0	18	826	0	82	892	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.8	7.8		24.8	24.8		47.0	44.4		52.4	47.1	
Effective Green, g (s)	7.8	7.8		24.8	24.8		47.0	44.4		52.4	47.1	
Actuated g/C Ratio	0.09	0.09		0.27	0.27		0.52	0.49		0.58	0.52	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	152		364	479		294	1633		330	1803	
v/s Ratio Prot		0.03		c0.13	0.13		0.00	0.25		c0.01	c0.26	
v/s Ratio Perm	0.02			c0.12			0.03			0.13		
v/c Ratio	0.22	0.38		0.90	0.47		0.06	0.51		0.25	0.49	
Uniform Delay, d1	38.5	39.1		30.0	27.4		10.8	15.6		9.4	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	1.6		23.4	0.7		0.1	1.1		0.4	1.0	
Delay (s)	39.7	40.6		53.3	28.2		10.9	16.7		9.8	15.0	
Level of Service	D	D		D	C		B	B		A	B	
Approach Delay (s)		40.4			42.5			16.6			14.6	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	565	181	34	1032	165	204	394	18	255	704	87
Future Volume (vph)	67	565	181	34	1032	165	204	394	18	255	704	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3372		1750	3424		1750	3477		1750	3442	
Flt Permitted	0.10	1.00		0.23	1.00		0.16	1.00		0.43	1.00	
Satd. Flow (perm)	179	3372		432	3424		296	3477		788	3442	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	71	601	193	36	1042	176	217	419	19	271	749	93
RTOR Reduction (vph)	0	27	0	0	12	0	0	3	0	0	9	0
Lane Group Flow (vph)	71	767	0	36	1206	0	217	435	0	271	833	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	46.7	41.2		43.9	39.8		44.1	35.1		44.1	35.1	
Effective Green, g (s)	46.7	41.2		43.9	39.8		44.1	35.1		44.1	35.1	
Actuated g/C Ratio	0.43	0.38		0.40	0.36		0.40	0.32		0.40	0.32	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	155	1269		222	1245		238	1115		396	1104	
v/s Ratio Prot	c0.02	0.23		0.01	c0.35		c0.07	0.13		0.06	0.24	
v/s Ratio Perm	0.17			0.06			c0.29			0.22		
v/c Ratio	0.46	0.60		0.16	0.97		0.91	0.39		0.68	0.75	
Uniform Delay, d1	24.4	27.5		20.9	34.2		25.0	28.8		24.5	33.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.8		0.3	18.2		35.4	1.0		4.8	4.8	
Delay (s)	26.5	28.3		21.2	52.4		60.4	29.9		29.4	38.1	
Level of Service	C	C		C	D		E	C		C	D	
Approach Delay (s)		28.2			51.5			40.0			36.0	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↱			↱
Traffic Volume (veh/h)	0	792	1526	0	0	0
Future Volume (Veh/h)	0	792	1526	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	861	1659	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		250	233			
pX, platoon unblocked	0.84				0.84	0.84
vC, conflicting volume	1659				1946	553
vC1, stage 1 conf vol					1659	
vC2, stage 2 conf vol					287	
vCu, unblocked vol	1118				1460	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	521				221	911

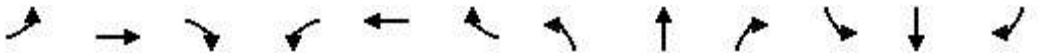
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	287	287	287	664	664	332	0
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.17	0.17	0.39	0.39	0.20	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							A
Approach Delay (s)	0.0			0.0			0.0
Approach LOS							A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	28	755	13	55	691
Future Volume (Veh/h)	9	28	755	13	55	691
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	30	821	14	60	751
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			359			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1699	828			835	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1725	739			747	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	92			92	
cM capacity (veh/h)	79	368			761	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	40	835	60	751
Volume Left	10	0	60	0
Volume Right	30	14	0	0
cSH	193	1700	761	1700
Volume to Capacity	0.21	0.49	0.08	0.44
Queue Length 95th (m)	5.7	0.0	1.9	0.0
Control Delay (s)	28.5	0.0	10.1	0.0
Lane LOS	D		B	
Approach Delay (s)	28.5	0.0	0.8	
Approach LOS	D			

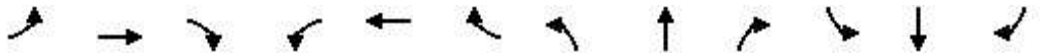
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	906	39	129	359	166	52	200	208	177	234	150
Future Volume (vph)	169	906	39	129	359	166	52	200	208	177	234	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3478		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.49	1.00		0.12	1.00	1.00	0.60	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	902	3478		225	3500	1566	1106	1842	1566	933	1842	1566
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	186	996	43	142	395	182	57	220	229	195	257	165
RTOR Reduction (vph)	0	3	0	0	0	122	0	0	157	0	0	95
Lane Group Flow (vph)	186	1036	0	142	395	60	57	220	72	195	257	70
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	39.0	32.0		40.6	32.8	32.8	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	39.0	32.0		40.6	32.8	32.8	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.39	0.32		0.41	0.33	0.33	0.31	0.31	0.31	0.43	0.43	0.43
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	416	1126		212	1161	519	347	577	491	454	783	665
v/s Ratio Prot	0.03	c0.30		c0.05	0.11			0.12		c0.03	0.14	
v/s Ratio Perm	0.14			0.22		0.04	0.05		0.05	c0.15		0.04
v/c Ratio	0.45	0.92		0.67	0.34	0.12	0.16	0.38	0.15	0.43	0.33	0.11
Uniform Delay, d1	20.3	32.2		22.2	24.9	22.9	24.5	26.4	24.4	18.7	19.0	17.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	11.8		7.8	0.2	0.1	1.0	1.9	0.6	0.7	1.1	0.3
Delay (s)	21.1	44.0		29.9	25.0	23.0	25.5	28.3	25.0	19.4	20.1	17.4
Level of Service	C	D		C	C	C	C	C	C	B	C	B
Approach Delay (s)		40.5			25.5			26.5			19.1	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	21.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

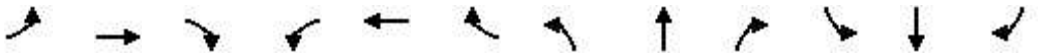
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1202	43	17	610	46	3	0	13	130	0	10
Future Volume (vph)	16	1202	43	17	610	46	3	0	13	130	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	5003		1750	4976		1750	1566		3395	1566	
Flt Permitted	0.36	1.00		0.16	1.00		1.00	1.00		0.71	1.00	
Satd. Flow (perm)	669	5003		302	4976		1842	1566		2553	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	1336	48	19	678	51	3	0	14	144	0	11
RTOR Reduction (vph)	0	2	0	0	5	0	0	14	0	0	10	0
Lane Group Flow (vph)	18	1382	0	19	724	0	3	0	0	144	1	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	56.0	54.9		56.0	54.9		3.2	1.6		13.1	7.5	
Effective Green, g (s)	56.0	54.9		56.0	54.9		3.2	1.6		13.1	7.5	
Actuated g/C Ratio	0.66	0.65		0.66	0.65		0.04	0.02		0.15	0.09	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	454	3227		217	3210		67	29		467	138	
v/s Ratio Prot	0.00	c0.28		c0.00	0.15		0.00	0.00		c0.03	0.00	
v/s Ratio Perm	0.03			0.06			0.00			c0.02		
v/c Ratio	0.04	0.43		0.09	0.23		0.04	0.01		0.31	0.01	
Uniform Delay, d1	5.0	7.4		5.2	6.3		39.5	41.0		31.8	35.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.4		0.2	0.2		0.3	0.1		0.4	0.0	
Delay (s)	5.1	7.8		5.4	6.4		39.8	41.1		32.2	35.4	
Level of Service	A	A		A	A		D	D		C	D	
Approach Delay (s)		7.8			6.4			40.9			32.4	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	85.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

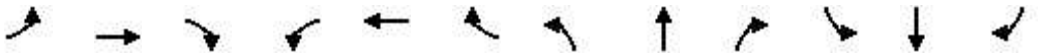
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	1028	153	236	621	127	94	197	144	242	433	77
Future Volume (vph)	101	1028	153	236	621	127	94	197	144	242	433	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4931		1750	4901		1750	3279		1750	3421	
Flt Permitted	0.35	1.00		0.11	1.00		0.44	1.00		0.43	1.00	
Satd. Flow (perm)	640	4931		211	4901		805	3279		798	3421	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	104	1060	158	243	640	131	97	203	148	249	446	79
RTOR Reduction (vph)	0	19	0	0	30	0	0	107	0	0	14	0
Lane Group Flow (vph)	104	1199	0	243	741	0	97	244	0	249	511	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.5	30.9		46.5	36.9		33.5	27.9		42.6	33.0	
Effective Green, g (s)	36.5	30.9		46.5	36.9		33.5	27.9		42.6	33.0	
Actuated g/C Ratio	0.36	0.31		0.46	0.36		0.33	0.28		0.42	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	292	1507		273	1788		319	904		437	1116	
v/s Ratio Prot	0.02	0.24		c0.10	0.15		0.02	0.07		c0.06	0.15	
v/s Ratio Perm	0.11			c0.31			0.08			c0.18		
v/c Ratio	0.36	0.80		0.89	0.41		0.30	0.27		0.57	0.46	
Uniform Delay, d1	21.9	32.2		24.0	24.0		23.9	28.6		20.0	27.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	3.0		28.1	0.2		0.5	0.7		1.7	1.4	
Delay (s)	22.7	35.2		52.0	24.2		24.5	29.4		21.7	28.3	
Level of Service	C	D		D	C		C	C		C	C	
Approach Delay (s)		34.2			30.8			28.3			26.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	101.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

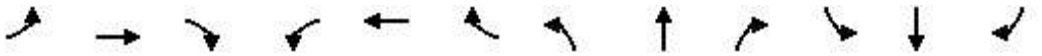
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	149	56	19	75	21	27	525	16	13	418	191
Future Volume (vph)	285	149	56	19	75	21	27	525	16	13	418	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	1.00		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1767		1750	1782		1750	3484		1750	3335	
Flt Permitted	0.47	1.00		0.62	1.00		0.36	1.00		0.43	1.00	
Satd. Flow (perm)	866	1767		1148	1782		666	3484		791	3335	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	300	157	59	20	79	22	28	553	17	14	440	201
RTOR Reduction (vph)	0	15	0	0	12	0	0	2	0	0	45	0
Lane Group Flow (vph)	300	201	0	20	89	0	28	568	0	14	596	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.2	23.2		8.5	8.5		45.2	42.7		42.6	41.4	
Effective Green, g (s)	23.2	23.2		8.5	8.5		45.2	42.7		42.6	41.4	
Actuated g/C Ratio	0.28	0.28		0.10	0.10		0.54	0.51		0.51	0.50	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	355	493		117	182		394	1790		419	1661	
v/s Ratio Prot	c0.11	0.11			0.05		c0.00	0.16		0.00	c0.18	
v/s Ratio Perm	c0.13			0.02			0.04			0.02		
v/c Ratio	0.85	0.41		0.17	0.49		0.07	0.32		0.03	0.36	
Uniform Delay, d1	26.7	24.4		34.1	35.3		8.9	11.7		10.0	12.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.6	0.6		0.7	2.1		0.1	0.5		0.0	0.6	
Delay (s)	43.4	24.9		34.8	37.3		9.0	12.2		10.0	13.3	
Level of Service	D	C		C	D		A	B		A	B	
Approach Delay (s)		35.6			36.9			12.1			13.3	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

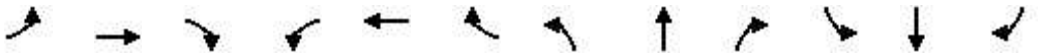
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	63	17	133	38	26	4	507	279	50	473	10
Future Volume (vph)	30	63	17	133	38	26	4	507	279	50	473	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.94		1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1784		1750	1728		1750	3313		1750	3489	
Flt Permitted	0.71	1.00		0.47	1.00		0.46	1.00		0.27	1.00	
Satd. Flow (perm)	1313	1784		872	1728		852	3313		488	3489	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	32	67	18	141	40	28	4	539	297	53	503	11
RTOR Reduction (vph)	0	11	0	0	22	0	0	64	0	0	1	0
Lane Group Flow (vph)	32	74	0	141	46	0	4	772	0	53	513	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.3	8.3		20.6	20.6		51.4	50.1		59.4	54.1	
Effective Green, g (s)	8.3	8.3		20.6	20.6		51.4	50.1		59.4	54.1	
Actuated g/C Ratio	0.09	0.09		0.22	0.22		0.56	0.54		0.65	0.59	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	160		274	386		488	1804		387	2051	
v/s Ratio Prot		0.04		c0.05	0.03		0.00	c0.23		c0.01	0.15	
v/s Ratio Perm	0.02			c0.07			0.00			0.08		
v/c Ratio	0.27	0.46		0.51	0.12		0.01	0.43		0.14	0.25	
Uniform Delay, d1	39.0	39.7		30.2	28.5		9.0	12.4		6.7	9.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	2.1		1.6	0.1		0.0	0.7		0.2	0.3	
Delay (s)	40.3	41.8		31.9	28.6		9.0	13.2		6.9	9.4	
Level of Service	D	D		C	C		A	B		A	A	
Approach Delay (s)		41.4			30.8			13.2			9.2	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

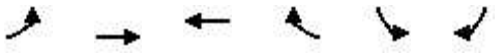
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	675	124	29	338	124	116	441	11	249	392	24
Future Volume (vph)	88	675	124	29	338	124	116	441	11	249	392	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3419		1750	3359		1750	3487		1750	3469	
Flt Permitted	0.33	1.00		0.16	1.00		0.49	1.00		0.40	1.00	
Satd. Flow (perm)	610	3419		302	3359		908	3487		728	3469	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	95	726	133	31	363	133	125	474	12	268	422	26
RTOR Reduction (vph)	0	15	0	0	38	0	0	2	0	0	4	0
Lane Group Flow (vph)	95	844	0	31	458	0	125	484	0	268	444	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	31.4	25.9		28.4	24.4		43.5	36.5		48.9	39.2	
Effective Green, g (s)	31.4	25.9		28.4	24.4		43.5	36.5		48.9	39.2	
Actuated g/C Ratio	0.33	0.27		0.30	0.25		0.45	0.38		0.51	0.41	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	264	921		149	852		472	1324		473	1415	
v/s Ratio Prot	c0.02	c0.25		0.01	0.14		0.02	0.14		c0.06	0.13	
v/s Ratio Perm	0.10			0.05			0.10			c0.23		
v/c Ratio	0.36	0.92		0.21	0.54		0.26	0.37		0.57	0.31	
Uniform Delay, d1	23.4	34.0		25.7	31.0		15.5	21.5		14.0	19.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	13.5		0.7	0.7		0.3	0.8		1.6	0.6	
Delay (s)	24.2	47.5		26.4	31.6		15.8	22.2		15.6	19.9	
Level of Service	C	D		C	C		B	C		B	B	
Approach Delay (s)		45.2			31.3			20.9			18.3	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↱			↱
Traffic Volume (veh/h)	0	1241	507	15	0	80
Future Volume (Veh/h)	0	1241	507	15	0	80
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1349	551	16	0	87
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		250	233			
pX, platoon unblocked					0.86	
vC, conflicting volume	551				1009	192
vC1, stage 1 conf vol					559	
vC2, stage 2 conf vol					450	
vCu, unblocked vol	551				447	192
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	89
cM capacity (veh/h)	1015				522	818

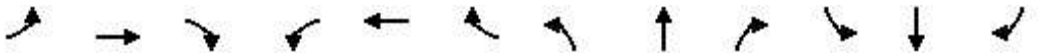
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	450	450	450	220	220	126	87
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	16	87
cSH	1700	1700	1700	1700	1700	1700	818
Volume to Capacity	0.26	0.26	0.26	0.13	0.13	0.07	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	2.7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.9
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.9
Approach LOS							A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	16	59	529	6	54	545
Future Volume (Veh/h)	16	59	529	6	54	545
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	64	575	7	59	592
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			359			
pX, platoon unblocked						
vC, conflicting volume	992	291			582	
vC1, stage 1 conf vol	578					
vC2, stage 2 conf vol	414					
vCu, unblocked vol	992	291			582	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	91			94	
cM capacity (veh/h)	436	706			988	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	81	383	199	59	296	296
Volume Left	17	0	0	59	0	0
Volume Right	64	0	7	0	0	0
cSH	624	1700	1700	988	1700	1700
Volume to Capacity	0.13	0.23	0.12	0.06	0.17	0.17
Queue Length 95th (m)	3.4	0.0	0.0	1.4	0.0	0.0
Control Delay (s)	11.6	0.0	0.0	8.9	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	11.6	0.0		0.8		
Approach LOS	B					

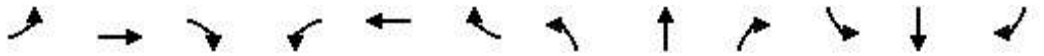
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	593	27	272	1138	407	73	324	213	175	315	277
Future Volume (vph)	146	593	27	272	1138	407	73	324	213	175	315	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3477		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.14	1.00		0.23	1.00	1.00	0.56	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	251	3477		433	3500	1566	1039	1842	1566	638	1842	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	151	611	28	280	1173	420	75	334	220	180	325	286
RTOR Reduction (vph)	0	4	0	0	0	246	0	0	118	0	0	124
Lane Group Flow (vph)	151	635	0	280	1173	174	75	334	102	180	325	162
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	36.4	29.4		46.0	35.0	35.0	30.0	30.0	30.0	41.0	41.0	41.0
Effective Green, g (s)	36.4	29.4		46.0	35.0	35.0	30.0	30.0	30.0	41.0	41.0	41.0
Actuated g/C Ratio	0.36	0.29		0.46	0.35	0.35	0.30	0.30	0.30	0.41	0.41	0.41
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	1022		365	1225	548	311	552	469	339	755	642
v/s Ratio Prot	0.05	0.18		c0.10	c0.34			c0.18		c0.04	0.18	
v/s Ratio Perm	0.23			0.26		0.11	0.07		0.07	0.18		0.10
v/c Ratio	0.77	0.62		0.77	0.96	0.32	0.24	0.61	0.22	0.53	0.43	0.25
Uniform Delay, d1	25.1	30.5		19.0	31.8	23.8	26.4	29.9	26.2	20.4	21.1	19.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.9	1.2		9.3	16.4	0.3	1.8	4.9	1.1	1.6	1.8	0.9
Delay (s)	41.9	31.7		28.3	48.2	24.1	28.2	34.8	27.3	22.0	22.9	20.4
Level of Service	D	C		C	D	C	C	C	C	C	C	C
Approach Delay (s)		33.6			39.8			31.4			21.8	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	109.5%	ICU Level of Service	H
Analysis Period (min)	15		

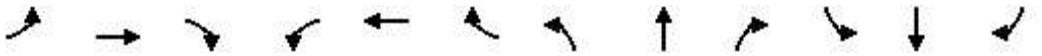
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	907	40	4	1701	119	68	0	15	125	0	15
Future Volume (vph)	58	907	40	4	1701	119	68	0	15	125	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4997		1750	4980		1750	1566		3395	1566	
Flt Permitted	0.07	1.00		0.28	1.00		1.00	1.00		0.77	1.00	
Satd. Flow (perm)	121	4997		507	4980		1842	1566		2749	1566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	955	42	4	1791	125	72	0	16	132	0	16
RTOR Reduction (vph)	0	3	0	0	5	0	0	16	0	0	15	0
Lane Group Flow (vph)	61	994	0	4	1911	0	72	0	0	132	1	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	66.4	61.2		58.2	57.0		9.5	1.8		16.3	5.2	
Effective Green, g (s)	66.4	61.2		58.2	57.0		9.5	1.8		16.3	5.2	
Actuated g/C Ratio	0.70	0.64		0.61	0.60		0.10	0.02		0.17	0.05	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	176	3208		325	2978		176	29		545	85	
v/s Ratio Prot	c0.02	0.20		0.00	c0.38		c0.03	0.00		c0.03	0.00	
v/s Ratio Perm	0.22			0.01			0.01			c0.01		
v/c Ratio	0.35	0.31		0.01	0.64		0.41	0.01		0.24	0.01	
Uniform Delay, d1	8.4	7.6		7.2	12.5		40.3	45.9		34.1	42.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.3		0.0	1.1		1.5	0.1		0.2	0.0	
Delay (s)	9.6	7.9		7.3	13.6		41.9	46.0		34.3	42.7	
Level of Service	A	A		A	B		D	D		C	D	
Approach Delay (s)		8.0			13.6			42.6			35.2	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	95.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

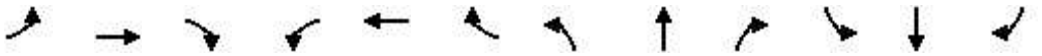
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	1061	189	238	1353	382	277	591	186	198	431	97
Future Volume (vph)	174	1061	189	238	1353	382	277	591	186	198	431	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4915		1750	4863		1750	3374		1750	3404	
Flt Permitted	0.11	1.00		0.10	1.00		0.26	1.00		0.15	1.00	
Satd. Flow (perm)	209	4915		187	4863		481	3374		276	3404	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	185	1129	201	253	1439	406	295	629	198	211	459	103
RTOR Reduction (vph)	0	22	0	0	46	0	0	27	0	0	17	0
Lane Group Flow (vph)	185	1308	0	253	1799	0	295	800	0	211	545	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	44.3	35.3		53.1	40.1		41.0	28.0		38.4	26.7	
Effective Green, g (s)	44.3	35.3		53.1	40.1		41.0	28.0		38.4	26.7	
Actuated g/C Ratio	0.41	0.32		0.49	0.37		0.38	0.26		0.35	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	212	1594		289	1792		332	868		255	835	
v/s Ratio Prot	0.07	0.27		c0.11	c0.37		c0.11	c0.24		0.09	0.16	
v/s Ratio Perm	0.28			0.31			0.23			0.20		
v/c Ratio	0.87	0.82		0.88	1.00		0.89	0.92		0.83	0.65	
Uniform Delay, d1	26.2	33.8		28.1	34.3		27.0	39.3		28.0	36.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.2	4.9		24.2	22.2		23.7	14.9		19.3	1.8	
Delay (s)	56.4	38.7		52.3	56.5		50.7	54.2		47.3	38.7	
Level of Service	E	D		D	E		D	D		D	D	
Approach Delay (s)		40.9			56.0			53.3			41.0	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

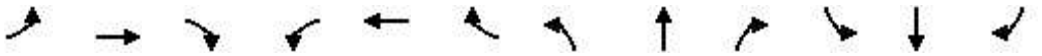
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	161	46	38	224	30	95	600	38	21	764	383
Future Volume (vph)	290	161	46	38	224	30	95	600	38	21	764	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1781		1750	1810		1750	3469		1750	3324	
Flt Permitted	0.24	1.00		0.62	1.00		0.09	1.00		0.34	1.00	
Satd. Flow (perm)	448	1781		1133	1810		158	3469		627	3324	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	322	179	51	42	249	33	106	667	42	23	849	426
RTOR Reduction (vph)	0	10	0	0	5	0	0	4	0	0	57	0
Lane Group Flow (vph)	322	220	0	42	277	0	106	705	0	23	1218	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	38.4	38.4		19.4	19.4		53.5	46.8		45.2	42.5	
Effective Green, g (s)	38.4	38.4		19.4	19.4		53.5	46.8		45.2	42.5	
Actuated g/C Ratio	0.37	0.37		0.19	0.19		0.51	0.45		0.44	0.41	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	353	658		211	337		188	1562		301	1359	
v/s Ratio Prot	c0.13	0.12			0.15		c0.04	0.20		0.00	c0.37	
v/s Ratio Perm	c0.21			0.04			0.25			0.03		
v/c Ratio	0.91	0.33		0.20	0.82		0.56	0.45		0.08	0.90	
Uniform Delay, d1	26.6	23.6		35.7	40.6		19.9	19.7		16.9	28.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.0	0.3		0.5	14.8		3.8	0.9		0.1	9.5	
Delay (s)	53.5	23.9		36.2	55.4		23.8	20.6		17.0	38.2	
Level of Service	D	C		D	E		C	C		B	D	
Approach Delay (s)		41.2			52.9			21.0			37.8	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	103.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

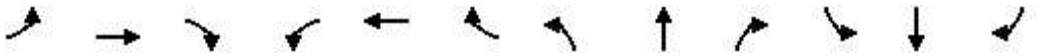
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	49	19	317	154	73	16	593	276	74	833	54
Future Volume (vph)	20	49	19	317	154	73	16	593	276	74	833	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1753		1750	3333		1750	3468	
Flt Permitted	0.60	1.00		0.47	1.00		0.22	1.00		0.19	1.00	
Satd. Flow (perm)	1108	1766		869	1753		399	3333		352	3468	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	22	55	21	356	173	82	18	666	310	83	936	61
RTOR Reduction (vph)	0	14	0	0	17	0	0	44	0	0	3	0
Lane Group Flow (vph)	22	62	0	356	238	0	18	932	0	83	994	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.0	8.0		30.4	30.4		49.4	46.8		54.6	49.4	
Effective Green, g (s)	8.0	8.0		30.4	30.4		49.4	46.8		54.6	49.4	
Actuated g/C Ratio	0.08	0.08		0.31	0.31		0.50	0.48		0.55	0.50	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	143		433	541		236	1585		269	1741	
v/s Ratio Prot		0.04		c0.15	0.14		0.00	0.28		c0.02	c0.29	
v/s Ratio Perm	0.02			c0.10			0.04			0.15		
v/c Ratio	0.24	0.44		0.82	0.44		0.08	0.59		0.31	0.57	
Uniform Delay, d1	42.4	43.0		29.6	27.2		13.0	18.8		12.0	17.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	2.1		11.9	0.6		0.1	1.6		0.7	1.4	
Delay (s)	43.8	45.2		41.5	27.8		13.2	20.4		12.7	18.5	
Level of Service	D	D		D	C		B	C		B	B	
Approach Delay (s)		44.9			35.8			20.3			18.0	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	98.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	612	195	37	1117	178	212	454	19	266	786	91
Future Volume (vph)	73	612	195	37	1117	178	212	454	19	266	786	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3373		1750	3425		1750	3479		1750	3445	
Flt Permitted	0.08	1.00		0.21	1.00		0.11	1.00		0.35	1.00	
Satd. Flow (perm)	156	3373		385	3425		208	3479		642	3445	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	78	651	207	39	1128	189	226	483	20	283	836	97
RTOR Reduction (vph)	0	25	0	0	11	0	0	2	0	0	8	0
Lane Group Flow (vph)	78	833	0	39	1306	0	226	501	0	283	925	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	52.7	47.2		49.9	45.8		47.4	35.4		48.8	36.1	
Effective Green, g (s)	52.7	47.2		49.9	45.8		47.4	35.4		48.8	36.1	
Actuated g/C Ratio	0.44	0.40		0.42	0.38		0.40	0.30		0.41	0.30	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	1333		207	1313		237	1031		380	1041	
v/s Ratio Prot	c0.03	0.25		0.01	c0.38		c0.10	0.14		0.08	0.27	
v/s Ratio Perm	0.22			0.07			c0.28			0.23		
v/c Ratio	0.55	0.63		0.19	0.99		0.95	0.49		0.74	0.89	
Uniform Delay, d1	27.2	29.0		21.9	36.7		30.6	34.5		26.0	39.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.9		0.4	23.4		45.3	1.6		7.7	11.3	
Delay (s)	31.5	29.9		22.4	60.1		75.9	36.2		33.7	51.0	
Level of Service	C	C		C	E		E	D		C	D	
Approach Delay (s)		30.0			59.0			48.5			47.0	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	103.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↱			↱
Traffic Volume (veh/h)	0	891	1659	41	0	70
Future Volume (Veh/h)	0	891	1659	41	0	70
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	968	1803	45	0	76
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		250	233			
pX, platoon unblocked	0.76				0.77	0.76
vC, conflicting volume	1803				2148	624
vC1, stage 1 conf vol					1826	
vC2, stage 2 conf vol					323	
vCu, unblocked vol	959				1328	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	91
cM capacity (veh/h)	543				234	826

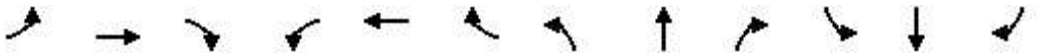
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	323	323	323	721	721	406	76
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	45	76
cSH	1700	1700	1700	1700	1700	1700	826
Volume to Capacity	0.19	0.19	0.19	0.42	0.42	0.24	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	2.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.8
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.8
Approach LOS							A

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	44.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	47	862	15	129	754
Future Volume (Veh/h)	13	47	862	15	129	754
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	51	937	16	140	820
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			359			
pX, platoon unblocked						
vC, conflicting volume	1635	476			953	
vC1, stage 1 conf vol	945					
vC2, stage 2 conf vol	690					
vCu, unblocked vol	1635	476			953	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	90			80	
cM capacity (veh/h)	254	535			717	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	65	625	328	140	410	410
Volume Left	14	0	0	140	0	0
Volume Right	51	0	16	0	0	0
cSH	432	1700	1700	717	1700	1700
Volume to Capacity	0.15	0.37	0.19	0.20	0.24	0.24
Queue Length 95th (m)	4.0	0.0	0.0	5.5	0.0	0.0
Control Delay (s)	14.8	0.0	0.0	11.2	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	14.8	0.0		1.6		
Approach LOS	B					

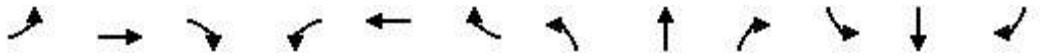
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	927	40	131	366	165	55	210	217	183	245	157
Future Volume (vph)	173	927	40	131	366	165	55	210	217	183	245	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3478		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.44	1.00		0.13	1.00	1.00	0.59	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	810	3478		237	3500	1566	1093	1842	1566	906	1842	1566
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	190	1019	44	144	402	181	60	231	238	201	269	173
RTOR Reduction (vph)	0	3	0	0	0	124	0	0	163	0	0	100
Lane Group Flow (vph)	190	1060	0	144	402	57	60	231	75	201	269	73
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	41.7	32.9		38.1	31.1	31.1	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	41.7	32.9		38.1	31.1	31.1	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.42	0.33		0.39	0.31	0.31	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	425	1156		198	1100	492	342	577	490	444	782	665
v/s Ratio Prot	c0.04	c0.30		c0.05	0.11			0.13		c0.03	0.15	
v/s Ratio Perm	0.15			0.23		0.04	0.05		0.05	c0.16		0.05
v/c Ratio	0.45	0.92		0.73	0.37	0.12	0.18	0.40	0.15	0.45	0.34	0.11
Uniform Delay, d1	18.7	31.7		23.3	26.3	24.1	24.7	26.7	24.5	19.1	19.2	17.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	11.3		12.5	0.2	0.1	1.1	2.1	0.7	0.7	1.2	0.3
Delay (s)	19.5	43.0		35.8	26.5	24.2	25.8	28.7	25.1	19.8	20.4	17.5
Level of Service	B	D		D	C	C	C	C	C	B	C	B
Approach Delay (s)		39.4			27.8			26.8			19.4	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	21.0
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

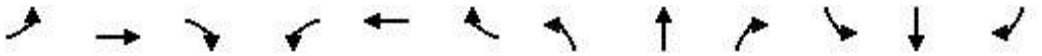
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1230	44	17	622	44	3	0	14	124	0	10
Future Volume (vph)	16	1230	44	17	622	44	3	0	14	124	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	5003		1750	4979		1750	1566		3395	1566	
Flt Permitted	0.36	1.00		0.16	1.00		1.00	1.00		0.71	1.00	
Satd. Flow (perm)	661	5003		289	4979		1842	1566		2553	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	1367	49	19	691	49	3	0	16	138	0	11
RTOR Reduction (vph)	0	2	0	0	5	0	0	16	0	0	10	0
Lane Group Flow (vph)	18	1414	0	19	735	0	3	0	0	138	1	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	56.0	54.9		56.0	54.9		3.2	1.6		13.1	7.5	
Effective Green, g (s)	56.0	54.9		56.0	54.9		3.2	1.6		13.1	7.5	
Actuated g/C Ratio	0.66	0.65		0.66	0.65		0.04	0.02		0.15	0.09	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	449	3227		209	3212		67	29		467	138	
v/s Ratio Prot	0.00	c0.28		c0.00	0.15		0.00	0.00		c0.03	0.00	
v/s Ratio Perm	0.03			0.06			0.00			c0.02		
v/c Ratio	0.04	0.44		0.09	0.23		0.04	0.01		0.30	0.01	
Uniform Delay, d1	5.0	7.5		5.3	6.3		39.5	41.0		31.8	35.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.4		0.2	0.2		0.3	0.1		0.4	0.0	
Delay (s)	5.1	7.9		5.5	6.5		39.8	41.1		32.1	35.4	
Level of Service	A	A		A	A		D	D		C	D	
Approach Delay (s)		7.9			6.4			40.9			32.4	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	85.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

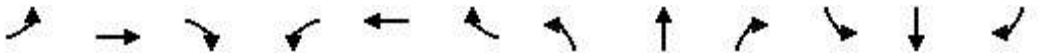
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	1045	155	242	632	130	97	207	151	254	455	79
Future Volume (vph)	103	1045	155	242	632	130	97	207	151	254	455	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4931		1750	4900		1750	3278		1750	3423	
Flt Permitted	0.32	1.00		0.12	1.00		0.42	1.00		0.42	1.00	
Satd. Flow (perm)	593	4931		217	4900		772	3278		772	3423	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	106	1077	160	249	652	134	100	213	156	262	469	81
RTOR Reduction (vph)	0	20	0	0	31	0	0	113	0	0	13	0
Lane Group Flow (vph)	106	1217	0	249	755	0	100	256	0	262	537	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.0	30.0		45.7	34.7		33.5	27.9		42.7	33.1	
Effective Green, g (s)	37.0	30.0		45.7	34.7		33.5	27.9		42.7	33.1	
Actuated g/C Ratio	0.37	0.30		0.46	0.35		0.33	0.28		0.43	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	299	1473		277	1693		312	910		433	1128	
v/s Ratio Prot	0.02	0.25		c0.10	0.15		0.02	0.08		c0.07	0.16	
v/s Ratio Perm	0.11			c0.30			0.09			c0.19		
v/c Ratio	0.35	0.83		0.90	0.45		0.32	0.28		0.61	0.48	
Uniform Delay, d1	21.3	32.8		24.1	25.4		23.7	28.4		19.8	26.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	3.9		29.1	0.2		0.6	0.8		2.4	1.4	
Delay (s)	22.1	36.7		53.2	25.6		24.3	29.2		22.2	28.2	
Level of Service	C	D		D	C		C	C		C	C	
Approach Delay (s)		35.6			32.2			28.1			26.3	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

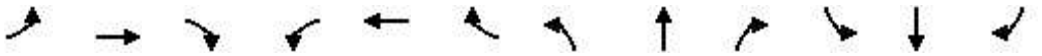
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	156	59	20	79	22	29	539	17	13	423	196
Future Volume (vph)	300	156	59	20	79	22	29	539	17	13	423	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	1.00		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1782		1750	3484		1750	3334	
Flt Permitted	0.47	1.00		0.62	1.00		0.34	1.00		0.43	1.00	
Satd. Flow (perm)	869	1766		1137	1782		618	3484		784	3334	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	164	62	21	83	23	31	567	18	14	445	206
RTOR Reduction (vph)	0	15	0	0	11	0	0	1	0	0	44	0
Lane Group Flow (vph)	316	211	0	21	95	0	31	584	0	14	607	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	27.3	27.3		8.7	8.7		48.9	45.1		43.7	42.5	
Effective Green, g (s)	27.3	27.3		8.7	8.7		48.9	45.1		43.7	42.5	
Actuated g/C Ratio	0.30	0.30		0.10	0.10		0.55	0.50		0.49	0.47	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	408	538		110	173		385	1753		395	1581	
v/s Ratio Prot	c0.13	0.12			0.05		c0.00	0.17		0.00	c0.18	
v/s Ratio Perm	c0.11			0.02			0.04			0.02		
v/c Ratio	0.77	0.39		0.19	0.55		0.08	0.33		0.04	0.38	
Uniform Delay, d1	26.6	24.6		37.2	38.6		9.8	13.3		11.9	15.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.9	0.5		0.8	3.7		0.1	0.5		0.0	0.7	
Delay (s)	35.4	25.1		38.1	42.3		9.8	13.8		11.9	15.8	
Level of Service	D	C		D	D		A	B		B	B	
Approach Delay (s)		31.1			41.6			13.6			15.8	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	89.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

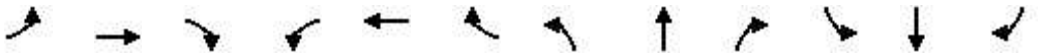
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	67	18	139	40	27	4	512	285	51	480	10
Future Volume (vph)	31	67	18	139	40	27	4	512	285	51	480	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.94		1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1784		1750	1731		1750	3312		1750	3489	
Flt Permitted	0.71	1.00		0.47	1.00		0.46	1.00		0.26	1.00	
Satd. Flow (perm)	1308	1784		872	1731		845	3312		479	3489	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	33	71	19	148	43	29	4	545	303	54	511	11
RTOR Reduction (vph)	0	11	0	0	22	0	0	66	0	0	1	0
Lane Group Flow (vph)	33	79	0	148	50	0	4	782	0	54	521	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.4	8.4		20.8	20.8		51.3	50.0		59.3	54.0	
Effective Green, g (s)	8.4	8.4		20.8	20.8		51.3	50.0		59.3	54.0	
Actuated g/C Ratio	0.09	0.09		0.23	0.23		0.56	0.54		0.64	0.59	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	119	162		277	390		483	1798		381	2045	
v/s Ratio Prot		0.04		c0.05	0.03		0.00	c0.24		c0.01	0.15	
v/s Ratio Perm	0.03			c0.07			0.00			0.08		
v/c Ratio	0.28	0.49		0.53	0.13		0.01	0.44		0.14	0.25	
Uniform Delay, d1	39.0	39.8		30.2	28.4		9.1	12.6		6.9	9.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	2.3		2.0	0.1		0.0	0.8		0.2	0.3	
Delay (s)	40.3	42.1		32.2	28.6		9.1	13.4		7.0	9.6	
Level of Service	D	D		C	C		A	B		A	A	
Approach Delay (s)		41.6			31.0			13.3			9.3	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	92.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	710	130	30	355	130	119	444	11	255	397	25
Future Volume (vph)	93	710	130	30	355	130	119	444	11	255	397	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3418		1750	3359		1750	3487		1750	3469	
Flt Permitted	0.31	1.00		0.16	1.00		0.49	1.00		0.39	1.00	
Satd. Flow (perm)	580	3418		291	3359		902	3487		719	3469	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	100	763	140	32	382	140	128	477	12	274	427	27
RTOR Reduction (vph)	0	15	0	0	38	0	0	2	0	0	5	0
Lane Group Flow (vph)	100	888	0	32	484	0	128	487	0	274	449	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.3	26.8		29.3	25.3		43.4	36.4		49.0	39.2	
Effective Green, g (s)	32.3	26.8		29.3	25.3		43.4	36.4		49.0	39.2	
Actuated g/C Ratio	0.33	0.28		0.30	0.26		0.45	0.38		0.51	0.40	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	259	944		148	876		464	1308		467	1401	
v/s Ratio Prot	c0.02	c0.26		0.01	0.14		0.02	0.14		c0.06	0.13	
v/s Ratio Perm	0.11			0.06			0.10			c0.24		
v/c Ratio	0.39	0.94		0.22	0.55		0.28	0.37		0.59	0.32	
Uniform Delay, d1	23.3	34.3		25.7	31.0		16.0	22.0		14.4	19.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	16.8		0.7	0.8		0.3	0.8		1.9	0.6	
Delay (s)	24.3	51.1		26.5	31.7		16.3	22.8		16.3	20.4	
Level of Service	C	D		C	C		B	C		B	C	
Approach Delay (s)		48.4			31.4			21.5			18.9	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↱			↱
Traffic Volume (veh/h)	0	1278	519	14	0	77
Future Volume (Veh/h)	0	1278	519	14	0	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1389	564	15	0	84
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		250	233			
pX, platoon unblocked					0.85	
vC, conflicting volume	564				1034	196
vC1, stage 1 conf vol					572	
vC2, stage 2 conf vol					463	
vCu, unblocked vol	564				435	196
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	90
cM capacity (veh/h)	1004				515	813

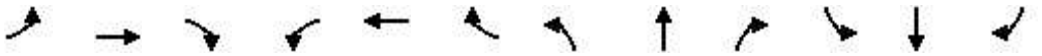
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	463	463	463	226	226	128	84
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	15	84
cSH	1700	1700	1700	1700	1700	1700	813
Volume to Capacity	0.27	0.27	0.27	0.13	0.13	0.08	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	2.6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.9
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.9
Approach LOS							A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	56	543	6	52	570
Future Volume (Veh/h)	15	56	543	6	52	570
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	61	590	7	57	620
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			359			
pX, platoon unblocked						
vC, conflicting volume	1018	298			597	
vC1, stage 1 conf vol	594					
vC2, stage 2 conf vol	424					
vCu, unblocked vol	1018	298			597	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	91			94	
cM capacity (veh/h)	428	698			976	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	77	393	204	57	310	310
Volume Left	16	0	0	57	0	0
Volume Right	61	0	7	0	0	0
cSH	617	1700	1700	976	1700	1700
Volume to Capacity	0.12	0.23	0.12	0.06	0.18	0.18
Queue Length 95th (m)	3.2	0.0	0.0	1.4	0.0	0.0
Control Delay (s)	11.7	0.0	0.0	8.9	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	11.7	0.0		0.8		
Approach LOS	B					

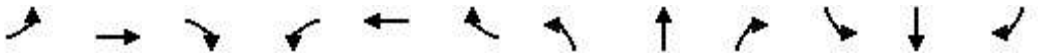
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	606	27	278	1165	412	77	340	221	181	330	290
Future Volume (vph)	149	606	27	278	1165	412	77	340	221	181	330	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3477		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.14	1.00		0.22	1.00	1.00	0.56	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	253	3477		413	3500	1566	1025	1842	1566	617	1842	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	154	625	28	287	1201	425	79	351	228	187	340	299
RTOR Reduction (vph)	0	3	0	0	0	245	0	0	116	0	0	124
Lane Group Flow (vph)	154	650	0	287	1201	180	79	351	112	187	340	175
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	36.1	29.1		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	36.1	29.1		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.36	0.29		0.45	0.34	0.34	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	1011		344	1190	532	317	571	485	338	773	657
v/s Ratio Prot	0.05	0.19		c0.10	c0.34			c0.19		c0.04	0.18	
v/s Ratio Perm	0.23			0.28		0.12	0.08		0.07	0.19		0.11
v/c Ratio	0.79	0.64		0.83	1.01	0.34	0.25	0.61	0.23	0.55	0.44	0.27
Uniform Delay, d1	25.8	30.9		19.9	33.0	24.6	25.8	29.4	25.6	20.0	20.6	18.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.4	1.4		15.8	28.4	0.4	1.9	4.9	1.1	2.0	1.8	1.0
Delay (s)	44.2	32.3		35.7	61.4	25.0	27.7	34.3	26.8	21.9	22.4	19.9
Level of Service	D	C		D	E	C	C	C	C	C	C	B
Approach Delay (s)		34.6			49.4			30.9			21.4	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		

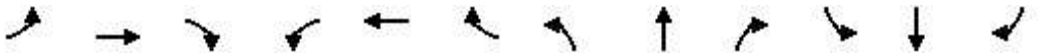
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	927	41	4	1738	114	71	0	16	120	0	15
Future Volume (vph)	56	927	41	4	1738	114	71	0	16	120	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4997		1750	4982		1750	1566		3395	1566	
Flt Permitted	0.07	1.00		0.27	1.00		1.00	1.00		0.91	1.00	
Satd. Flow (perm)	121	4997		495	4982		1842	1566		3249	1566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	59	976	43	4	1829	120	75	0	17	126	0	16
RTOR Reduction (vph)	0	3	0	0	5	0	0	16	0	0	15	0
Lane Group Flow (vph)	59	1016	0	4	1944	0	75	1	0	126	1	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	66.4	61.2		58.2	57.0		11.3	3.6		12.9	4.4	
Effective Green, g (s)	66.4	61.2		58.2	57.0		11.3	3.6		12.9	4.4	
Actuated g/C Ratio	0.70	0.65		0.62	0.60		0.12	0.04		0.14	0.05	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	178	3236		320	3005		212	59		456	72	
v/s Ratio Prot	c0.02	0.20		0.00	c0.39		c0.03	0.00		0.02	0.00	
v/s Ratio Perm	0.21			0.01			c0.01			0.01		
v/c Ratio	0.33	0.31		0.01	0.65		0.35	0.01		0.28	0.01	
Uniform Delay, d1	8.2	7.4		7.0	12.2		38.3	43.7		36.6	43.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.3		0.0	1.1		1.0	0.1		0.3	0.1	
Delay (s)	9.3	7.6		7.0	13.3		39.3	43.8		36.9	43.0	
Level of Service	A	A		A	B		D	D		D	D	
Approach Delay (s)		7.7			13.3			40.1			37.6	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	94.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

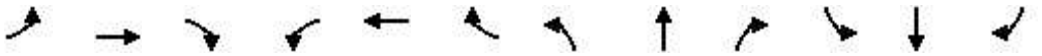
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	1080	191	244	1378	391	287	621	196	208	452	100
Future Volume (vph)	177	1080	191	244	1378	391	287	621	196	208	452	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4916		1750	4862		1750	3374		1750	3405	
Flt Permitted	0.12	1.00		0.11	1.00		0.26	1.00		0.14	1.00	
Satd. Flow (perm)	217	4916		194	4862		485	3374		256	3405	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	188	1149	203	260	1466	416	305	661	209	221	481	106
RTOR Reduction (vph)	0	23	0	0	46	0	0	28	0	0	17	0
Lane Group Flow (vph)	188	1329	0	260	1836	0	305	842	0	221	570	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.0	34.0		52.0	39.0		41.8	29.8		39.8	28.8	
Effective Green, g (s)	43.0	34.0		52.0	39.0		41.8	29.8		39.8	28.8	
Actuated g/C Ratio	0.40	0.31		0.48	0.36		0.38	0.27		0.37	0.26	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	212	1536		292	1742		325	924		244	901	
v/s Ratio Prot	0.07	0.27		c0.11	c0.38		c0.10	0.25		0.09	0.17	
v/s Ratio Perm	0.28			0.31			c0.26			0.24		
v/c Ratio	0.89	0.87		0.89	1.05		0.94	0.91		0.91	0.63	
Uniform Delay, d1	26.9	35.2		28.5	34.9		27.9	38.2		27.5	35.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.7	6.8		26.8	37.4		33.8	13.0		33.3	1.5	
Delay (s)	59.6	42.0		55.3	72.3		61.7	51.2		60.9	36.8	
Level of Service	E	D		E	E		E	D		E	D	
Approach Delay (s)		44.2			70.2			53.9			43.4	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

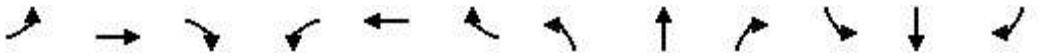
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	169	48	40	236	31	100	617	40	21	773	392
Future Volume (vph)	305	169	48	40	236	31	100	617	40	21	773	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1781		1750	1810		1750	3468		1750	3323	
Flt Permitted	0.21	1.00		0.61	1.00		0.08	1.00		0.32	1.00	
Satd. Flow (perm)	393	1781		1122	1810		152	3468		591	3323	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	339	188	53	44	262	34	111	686	44	23	859	436
RTOR Reduction (vph)	0	10	0	0	4	0	0	4	0	0	56	0
Lane Group Flow (vph)	339	231	0	44	292	0	111	726	0	23	1239	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.7	42.7		20.7	20.7		55.4	48.7		47.1	44.4	
Effective Green, g (s)	42.7	42.7		20.7	20.7		55.4	48.7		47.1	44.4	
Actuated g/C Ratio	0.39	0.39		0.19	0.19		0.50	0.44		0.43	0.40	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	374	690		210	340		178	1533		281	1340	
v/s Ratio Prot	c0.15	0.13			0.16		c0.04	0.21		0.00	c0.37	
v/s Ratio Perm	c0.20			0.04			0.27			0.03		
v/c Ratio	0.91	0.34		0.21	0.86		0.62	0.47		0.08	0.92	
Uniform Delay, d1	27.2	23.7		37.8	43.3		22.3	21.7		18.5	31.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.7	0.3		0.5	18.9		6.6	1.1		0.1	12.1	
Delay (s)	51.9	24.0		38.3	62.1		28.9	22.7		18.6	43.4	
Level of Service	D	C		D	E		C	C		B	D	
Approach Delay (s)		40.3			59.0			23.5			43.0	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

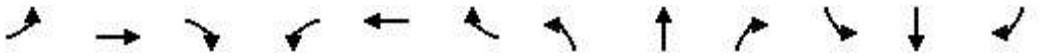
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	52	20	330	162	75	17	600	281	76	845	55
Future Volume (vph)	21	52	20	330	162	75	17	600	281	76	845	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1766		1750	1755		1750	3332		1750	3468	
Flt Permitted	0.60	1.00		0.47	1.00		0.21	1.00		0.19	1.00	
Satd. Flow (perm)	1096	1766		869	1755		387	3332		341	3468	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	24	58	22	371	182	84	19	674	316	85	949	62
RTOR Reduction (vph)	0	14	0	0	17	0	0	44	0	0	4	0
Lane Group Flow (vph)	24	66	0	371	249	0	19	946	0	85	1007	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.1	8.1		30.8	30.8		49.3	46.7		54.5	49.3	
Effective Green, g (s)	8.1	8.1		30.8	30.8		49.3	46.7		54.5	49.3	
Actuated g/C Ratio	0.08	0.08		0.31	0.31		0.50	0.47		0.55	0.50	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	89	144		438	547		229	1576		262	1732	
v/s Ratio Prot		0.04		c0.16	0.14		0.00	0.28		c0.02	c0.29	
v/s Ratio Perm	0.02			c0.10			0.04			0.16		
v/c Ratio	0.27	0.46		0.85	0.45		0.08	0.60		0.32	0.58	
Uniform Delay, d1	42.5	43.2		29.8	27.2		13.3	19.1		12.3	17.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	2.3		14.1	0.6		0.2	1.7		0.7	1.4	
Delay (s)	44.2	45.5		43.8	27.8		13.4	20.8		13.0	18.9	
Level of Service	D	D		D	C		B	C		B	B	
Approach Delay (s)		45.2			37.1			20.7			18.4	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	643	205	39	1174	187	217	458	19	272	796	93
Future Volume (vph)	77	643	205	39	1174	187	217	458	19	272	796	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3373		1750	3424		1750	3479		1750	3445	
Flt Permitted	0.09	1.00		0.18	1.00		0.11	1.00		0.38	1.00	
Satd. Flow (perm)	160	3373		325	3424		199	3479		702	3445	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	82	684	218	41	1186	199	231	487	20	289	847	99
RTOR Reduction (vph)	0	25	0	0	11	0	0	2	0	0	7	0
Lane Group Flow (vph)	82	877	0	41	1374	0	231	505	0	289	939	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	51.6	46.1		51.6	46.1		50.1	37.1		46.1	35.1	
Effective Green, g (s)	51.6	46.1		51.6	46.1		50.1	37.1		46.1	35.1	
Actuated g/C Ratio	0.43	0.39		0.43	0.39		0.42	0.31		0.39	0.29	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	1299		205	1318		251	1078		366	1010	
v/s Ratio Prot	c0.03	0.26		0.01	c0.40		c0.10	0.15		0.07	0.27	
v/s Ratio Perm	0.22			0.08			c0.28			0.23		
v/c Ratio	0.58	0.67		0.20	1.04		0.92	0.47		0.79	0.93	
Uniform Delay, d1	28.1	30.6		21.7	36.8		31.4	33.3		29.2	41.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	1.4		0.5	36.6		36.0	1.5		10.8	15.7	
Delay (s)	33.7	32.0		22.2	73.4		67.4	34.8		40.0	56.8	
Level of Service	C	C		C	E		E	C		D	E	
Approach Delay (s)		32.1			71.9			45.0			52.9	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	53.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	918	1700	39	0	67
Future Volume (Veh/h)	0	918	1700	39	0	67
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	998	1848	42	0	73
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		250	233			
pX, platoon unblocked	0.76				0.77	0.76
vC, conflicting volume	1848				2202	637
vC1, stage 1 conf vol					1869	
vC2, stage 2 conf vol					333	
vCu, unblocked vol	993				1316	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	91
cM capacity (veh/h)	523				225	820

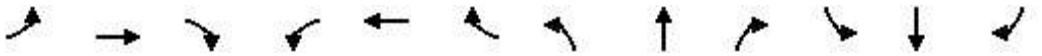
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	333	333	333	739	739	412	73
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	42	73
cSH	1700	1700	1700	1700	1700	1700	820
Volume to Capacity	0.20	0.20	0.20	0.43	0.43	0.24	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.8
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.8
Approach LOS							A

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	44.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	45	886	15	123	789
Future Volume (Veh/h)	12	45	886	15	123	789
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	49	963	16	134	858
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			359			
pX, platoon unblocked						
vC, conflicting volume	1668	490			979	
vC1, stage 1 conf vol	971					
vC2, stage 2 conf vol	697					
vCu, unblocked vol	1668	490			979	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	91			81	
cM capacity (veh/h)	248	524			701	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	62	642	337	134	429	429
Volume Left	13	0	0	134	0	0
Volume Right	49	0	16	0	0	0
cSH	425	1700	1700	701	1700	1700
Volume to Capacity	0.15	0.38	0.20	0.19	0.25	0.25
Queue Length 95th (m)	3.8	0.0	0.0	5.3	0.0	0.0
Control Delay (s)	14.9	0.0	0.0	11.3	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	14.9	0.0		1.5		
Approach LOS	B					

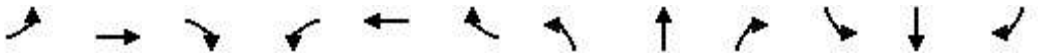
Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	949	41	133	373	165	57	220	226	190	257	164
Future Volume (vph)	178	949	41	133	373	165	57	220	226	190	257	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3478		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.43	1.00		0.13	1.00	1.00	0.59	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	796	3478		235	3500	1566	1081	1842	1566	878	1842	1566
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	196	1043	45	146	410	181	63	242	248	209	282	180
RTOR Reduction (vph)	0	3	0	0	0	124	0	0	162	0	0	104
Lane Group Flow (vph)	196	1085	0	146	410	57	63	242	86	209	282	76
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	42.1	33.2		38.3	31.3	31.3	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	42.1	33.2		38.3	31.3	31.3	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.42	0.33		0.39	0.32	0.32	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	423	1164		197	1104	494	337	575	489	433	779	663
v/s Ratio Prot	c0.04	c0.31		c0.05	0.12			0.13		c0.03	0.15	
v/s Ratio Perm	0.15			0.23		0.04	0.06		0.05	c0.17		0.05
v/c Ratio	0.46	0.93		0.74	0.37	0.12	0.19	0.42	0.18	0.48	0.36	0.11
Uniform Delay, d1	18.7	31.9		23.6	26.3	24.1	24.9	27.0	24.8	19.6	19.5	17.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	13.1		13.9	0.2	0.1	1.2	2.3	0.8	0.9	1.3	0.4
Delay (s)	19.5	45.0		37.5	26.5	24.2	26.1	29.2	25.6	20.5	20.8	17.7
Level of Service	B	D		D	C	C	C	C	C	C	C	B
Approach Delay (s)		41.1			28.1			27.2			19.9	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	99.2	Sum of lost time (s)	21.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		

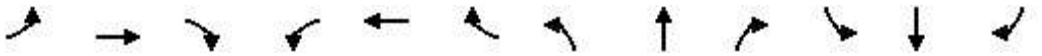
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	1259	45	18	634	42	4	0	14	119	0	10
Future Volume (vph)	15	1259	45	18	634	42	4	0	14	119	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	5003		1750	4982		1750	1566		3395	1566	
Flt Permitted	0.35	1.00		0.15	1.00		1.00	1.00		0.71	1.00	
Satd. Flow (perm)	654	5003		268	4982		1842	1566		2553	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	1399	50	20	704	47	4	0	16	132	0	11
RTOR Reduction (vph)	0	2	0	0	4	0	0	16	0	0	10	0
Lane Group Flow (vph)	17	1447	0	20	747	0	4	0	0	132	1	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	57.2	56.1		60.0	57.5		3.2	1.6		13.1	7.5	
Effective Green, g (s)	57.2	56.1		60.0	57.5		3.2	1.6		13.1	7.5	
Actuated g/C Ratio	0.65	0.64		0.68	0.66		0.04	0.02		0.15	0.09	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	440	3200		225	3266		65	28		453	133	
v/s Ratio Prot	0.00	c0.29		c0.00	0.15		0.00	0.00		c0.02	0.00	
v/s Ratio Perm	0.02			0.06			0.00			c0.02		
v/c Ratio	0.04	0.45		0.09	0.23		0.06	0.01		0.29	0.01	
Uniform Delay, d1	5.4	8.0		4.9	6.1		40.8	42.3		33.0	36.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.5		0.2	0.2		0.4	0.1		0.4	0.0	
Delay (s)	5.4	8.5		5.0	6.3		41.2	42.4		33.4	36.7	
Level of Service	A	A		A	A		D	D		C	D	
Approach Delay (s)		8.4			6.2			42.2			33.6	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	87.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

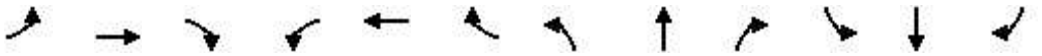
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1064	157	248	643	133	100	217	159	266	478	82
Future Volume (vph)	105	1064	157	248	643	133	100	217	159	266	478	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4932		1750	4900		1750	3278		1750	3423	
Flt Permitted	0.34	1.00		0.12	1.00		0.36	1.00		0.40	1.00	
Satd. Flow (perm)	622	4932		213	4900		663	3278		728	3423	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	108	1097	162	256	663	137	103	224	164	274	493	85
RTOR Reduction (vph)	0	18	0	0	31	0	0	121	0	0	13	0
Lane Group Flow (vph)	108	1241	0	256	769	0	103	267	0	274	565	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.6	30.6		48.5	37.5		34.1	27.1		41.9	31.0	
Effective Green, g (s)	37.6	30.6		48.5	37.5		34.1	27.1		41.9	31.0	
Actuated g/C Ratio	0.37	0.30		0.47	0.37		0.33	0.26		0.41	0.30	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	305	1472		309	1792		294	866		406	1035	
v/s Ratio Prot	0.02	0.25		c0.11	0.16		0.02	0.08		c0.07	0.17	
v/s Ratio Perm	0.11			c0.28			0.09			c0.20		
v/c Ratio	0.35	0.84		0.83	0.43		0.35	0.31		0.67	0.55	
Uniform Delay, d1	21.9	33.7		24.5	24.4		24.4	30.2		21.8	29.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	4.6		16.5	0.2		0.7	0.9		4.4	2.1	
Delay (s)	22.6	38.3		41.0	24.6		25.1	31.1		26.2	31.9	
Level of Service	C	D		D	C		C	C		C	C	
Approach Delay (s)		37.0			28.6			29.9			30.1	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

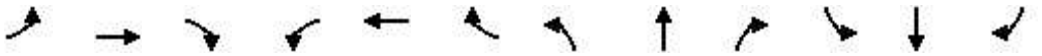
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	164	62	21	83	23	30	554	18	14	429	201
Future Volume (vph)	315	164	62	21	83	23	30	554	18	14	429	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	1.00		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1767		1750	1782		1750	3483		1750	3332	
Flt Permitted	0.47	1.00		0.61	1.00		0.33	1.00		0.41	1.00	
Satd. Flow (perm)	871	1767		1125	1782		603	3483		762	3332	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	332	173	65	22	87	24	32	583	19	15	452	212
RTOR Reduction (vph)	0	14	0	0	11	0	0	2	0	0	46	0
Lane Group Flow (vph)	332	224	0	22	100	0	32	600	0	15	618	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	27.9	27.9		8.9	8.9		48.8	45.0		43.6	42.4	
Effective Green, g (s)	27.9	27.9		8.9	8.9		48.8	45.0		43.6	42.4	
Actuated g/C Ratio	0.31	0.31		0.10	0.10		0.54	0.50		0.48	0.47	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	416	547		111	176		374	1739		381	1568	
v/s Ratio Prot	c0.13	0.13			0.06		c0.00	0.17		0.00	c0.19	
v/s Ratio Perm	c0.11			0.02			0.04			0.02		
v/c Ratio	0.80	0.41		0.20	0.57		0.09	0.35		0.04	0.39	
Uniform Delay, d1	26.6	24.6		37.3	38.8		10.0	13.6		12.1	15.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.2	0.5		0.9	4.2		0.1	0.5		0.0	0.7	
Delay (s)	36.9	25.1		38.2	43.0		10.1	14.2		12.2	16.2	
Level of Service	D	C		D	D		B	B		B	B	
Approach Delay (s)		31.9			42.2			14.0			16.2	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

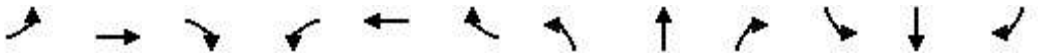
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	70	19	145	42	27	5	518	290	52	488	10
Future Volume (vph)	33	70	19	145	42	27	5	518	290	52	488	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.94		1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1783		1750	1734		1750	3311		1750	3489	
Flt Permitted	0.71	1.00		0.47	1.00		0.46	1.00		0.26	1.00	
Satd. Flow (perm)	1306	1783		872	1734		838	3311		470	3489	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	35	74	20	154	45	29	5	551	309	55	519	11
RTOR Reduction (vph)	0	11	0	0	22	0	0	67	0	0	1	0
Lane Group Flow (vph)	35	83	0	154	52	0	5	793	0	55	529	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.5	8.5		20.9	20.9		51.3	50.0		59.3	54.0	
Effective Green, g (s)	8.5	8.5		20.9	20.9		51.3	50.0		59.3	54.0	
Actuated g/C Ratio	0.09	0.09		0.23	0.23		0.56	0.54		0.64	0.59	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	164		277	393		479	1795		375	2043	
v/s Ratio Prot		0.05		c0.05	0.03		0.00	c0.24		c0.01	0.15	
v/s Ratio Perm	0.03			c0.08			0.01			0.09		
v/c Ratio	0.29	0.51		0.56	0.13		0.01	0.44		0.15	0.26	
Uniform Delay, d1	39.0	39.9		30.3	28.4		9.1	12.7		6.9	9.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	2.5		2.4	0.2		0.0	0.8		0.2	0.3	
Delay (s)	40.4	42.3		32.7	28.6		9.1	13.5		7.1	9.6	
Level of Service	D	D		C	C		A	B		A	A	
Approach Delay (s)		41.8			31.4			13.5			9.4	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	746	137	32	374	137	122	447	11	261	403	25
Future Volume (vph)	98	746	137	32	374	137	122	447	11	261	403	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3419		1750	3359		1750	3487		1750	3469	
Flt Permitted	0.31	1.00		0.15	1.00		0.46	1.00		0.41	1.00	
Satd. Flow (perm)	566	3419		275	3359		843	3487		749	3469	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	105	802	147	34	402	147	131	481	12	281	433	27
RTOR Reduction (vph)	0	15	0	0	38	0	0	2	0	0	4	0
Lane Group Flow (vph)	105	934	0	34	511	0	131	491	0	281	456	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	33.8	28.3		30.8	26.8		43.2	36.2		45.2	37.2	
Effective Green, g (s)	33.8	28.3		30.8	26.8		43.2	36.2		45.2	37.2	
Actuated g/C Ratio	0.35	0.29		0.32	0.28		0.45	0.38		0.47	0.39	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	265	1002		148	932		443	1308		433	1337	
v/s Ratio Prot	c0.02	c0.27		0.01	0.15		0.02	0.14		c0.05	0.13	
v/s Ratio Perm	0.12			0.06			0.11			c0.25		
v/c Ratio	0.40	0.93		0.23	0.55		0.30	0.38		0.65	0.34	
Uniform Delay, d1	22.1	33.2		24.7	29.7		15.9	21.9		17.3	21.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	14.8		0.8	0.7		0.4	0.8		3.3	0.7	
Delay (s)	23.1	48.0		25.5	30.4		16.3	22.8		20.7	21.7	
Level of Service	C	D		C	C		B	C		C	C	
Approach Delay (s)		45.5			30.1			21.4			21.3	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↱			↱
Traffic Volume (veh/h)	0	1317	532	14	0	73
Future Volume (Veh/h)	0	1317	532	14	0	73
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1432	578	15	0	79
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		250	233			
pX, platoon unblocked					0.84	
vC, conflicting volume	578				1063	200
vC1, stage 1 conf vol					586	
vC2, stage 2 conf vol					477	
vCu, unblocked vol	578				413	200
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	90
cM capacity (veh/h)	992				507	807

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	477	477	477	231	231	131	79
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	15	79
cSH	1700	1700	1700	1700	1700	1700	807
Volume to Capacity	0.28	0.28	0.28	0.14	0.14	0.08	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	2.5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.9
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.9
Approach LOS							A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	53	557	6	49	596
Future Volume (Veh/h)	14	53	557	6	49	596
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	58	605	7	53	648
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			359			
pX, platoon unblocked						
vC, conflicting volume	1038	306			612	
vC1, stage 1 conf vol	608					
vC2, stage 2 conf vol	430					
vCu, unblocked vol	1038	306			612	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			94	
cM capacity (veh/h)	421	690			963	

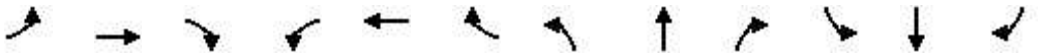
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	73	403	209	53	324	324
Volume Left	15	0	0	53	0	0
Volume Right	58	0	7	0	0	0
cSH	610	1700	1700	963	1700	1700
Volume to Capacity	0.12	0.24	0.12	0.06	0.19	0.19
Queue Length 95th (m)	3.1	0.0	0.0	1.3	0.0	0.0
Control Delay (s)	11.7	0.0	0.0	9.0	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	11.7	0.0		0.7		
Approach LOS	B					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	619	28	284	1192	418	81	357	230	188	346	304
Future Volume (vph)	152	619	28	284	1192	418	81	357	230	188	346	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	3477		1750	3500	1566	1750	1842	1566	1750	1842	1566
Flt Permitted	0.14	1.00		0.21	1.00	1.00	0.55	1.00	1.00	0.31	1.00	1.00
Satd. Flow (perm)	254	3477		396	3500	1566	1009	1842	1566	578	1842	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	157	638	29	293	1229	431	84	368	237	194	357	313
RTOR Reduction (vph)	0	4	0	0	0	236	0	0	115	0	0	123
Lane Group Flow (vph)	157	663	0	293	1229	195	84	368	122	194	357	190
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	36.0	29.0		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Effective Green, g (s)	36.0	29.0		45.0	34.0	34.0	31.0	31.0	31.0	42.0	42.0	42.0
Actuated g/C Ratio	0.36	0.29		0.45	0.34	0.34	0.31	0.31	0.31	0.42	0.42	0.42
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	1008		340	1190	532	312	571	485	324	773	657
v/s Ratio Prot	0.06	0.19		c0.10	c0.35			0.20		c0.04	0.19	
v/s Ratio Perm	0.23			0.28		0.12	0.08		0.08	c0.21		0.12
v/c Ratio	0.80	0.66		0.86	1.03	0.37	0.27	0.64	0.25	0.60	0.46	0.29
Uniform Delay, d1	25.9	31.2		20.1	33.0	24.9	26.0	29.7	25.8	20.6	20.9	19.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.5	1.6		19.5	34.9	0.4	2.1	5.5	1.2	3.0	2.0	1.1
Delay (s)	46.4	32.7		39.6	67.9	25.3	28.1	35.3	27.1	23.6	22.8	20.3
Level of Service	D	C		D	E	C	C	D	C	C	C	C
Approach Delay (s)		35.3			54.2			31.6			22.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	111.4%	ICU Level of Service	H
Analysis Period (min)	15		

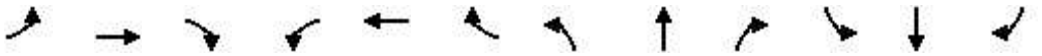
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	948	42	4	1777	109	75	0	17	115	0	14
Future Volume (vph)	54	948	42	4	1777	109	75	0	17	115	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4997		1750	4985		1750	1566		3395	1566	
Flt Permitted	0.07	1.00		0.26	1.00		0.98	1.00		1.00	1.00	
Satd. Flow (perm)	121	4997		484	4985		1797	1566		3574	1566	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	998	44	4	1871	115	79	0	18	121	0	15
RTOR Reduction (vph)	0	3	0	0	4	0	0	17	0	0	15	0
Lane Group Flow (vph)	57	1039	0	4	1982	0	79	1	0	121	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	66.4	61.2		58.2	57.0		14.1	4.1		11.1	2.6	
Effective Green, g (s)	66.4	61.2		58.2	57.0		14.1	4.1		11.1	2.6	
Actuated g/C Ratio	0.70	0.64		0.61	0.60		0.15	0.04		0.12	0.03	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	3219		312	2991		261	67		401	42	
v/s Ratio Prot	c0.02	0.21		0.00	c0.40		c0.03	0.00		0.03	0.00	
v/s Ratio Perm	0.21			0.01			c0.01			0.01		
v/c Ratio	0.32	0.32		0.01	0.66		0.30	0.01		0.30	0.01	
Uniform Delay, d1	8.6	7.6		7.1	12.6		36.1	43.5		38.4	44.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.3		0.0	1.2		0.7	0.1		0.4	0.1	
Delay (s)	9.7	7.9		7.2	13.8		36.7	43.6		38.9	45.0	
Level of Service	A	A		A	B		D	D		D	D	
Approach Delay (s)		8.0			13.8			38.0			39.5	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

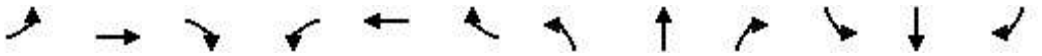
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	1099	194	250	1403	401	299	652	206	218	475	103
Future Volume (vph)	181	1099	194	250	1403	401	299	652	206	218	475	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	4916		1750	4861		1750	3374		1750	3406	
Flt Permitted	0.11	1.00		0.10	1.00		0.18	1.00		0.14	1.00	
Satd. Flow (perm)	195	4916		176	4861		335	3374		263	3406	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	193	1169	206	266	1493	427	318	694	219	232	505	110
RTOR Reduction (vph)	0	21	0	0	43	0	0	25	0	0	15	0
Lane Group Flow (vph)	193	1354	0	266	1877	0	318	888	0	232	600	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	47.8	37.8		58.0	44.0		49.7	32.0		41.7	28.0	
Effective Green, g (s)	47.8	37.8		58.0	44.0		49.7	32.0		41.7	28.0	
Actuated g/C Ratio	0.40	0.32		0.48	0.37		0.42	0.27		0.35	0.23	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	207	1552		298	1786		348	901		261	796	
v/s Ratio Prot	0.08	0.28		c0.12	c0.39		c0.13	c0.26		0.10	0.18	
v/s Ratio Perm	0.29			0.31			0.24			0.21		
v/c Ratio	0.93	0.87		0.89	1.05		0.91	0.99		0.89	0.75	
Uniform Delay, d1	29.6	38.7		33.4	37.9		27.3	43.6		31.8	42.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	43.7	7.1		26.7	36.1		27.5	26.2		28.4	4.1	
Delay (s)	73.3	45.8		60.0	74.0		54.8	69.9		60.2	46.7	
Level of Service	E	D		E	E		D	E		E	D	
Approach Delay (s)		49.1			72.3			66.0			50.4	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	61.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

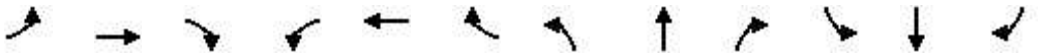
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	320	178	51	42	248	33	105	636	42	22	782	402
Future Volume (vph)	320	178	51	42	248	33	105	636	42	22	782	402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1780		1750	1809		1750	3467		1750	3322	
Flt Permitted	0.19	1.00		0.60	1.00		0.09	1.00		0.29	1.00	
Satd. Flow (perm)	356	1780		1108	1809		158	3467		534	3322	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	356	198	57	47	276	37	117	707	47	24	869	447
RTOR Reduction (vph)	0	10	0	0	5	0	0	4	0	0	58	0
Lane Group Flow (vph)	356	245	0	47	308	0	117	750	0	24	1258	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.2	43.2		21.2	21.2		53.5	46.5		47.7	43.6	
Effective Green, g (s)	43.2	43.2		21.2	21.2		53.5	46.5		47.7	43.6	
Actuated g/C Ratio	0.39	0.39		0.19	0.19		0.49	0.42		0.43	0.40	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	368	700		213	349		178	1468		277	1319	
v/s Ratio Prot	c0.16	0.14			0.17		c0.04	0.22		0.00	c0.38	
v/s Ratio Perm	c0.22			0.04			0.28			0.03		
v/c Ratio	0.97	0.35		0.22	0.88		0.66	0.51		0.09	0.95	
Uniform Delay, d1	27.3	23.4		37.3	43.1		23.1	23.3		18.2	32.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	37.9	0.3		0.5	22.1		8.5	1.3		0.1	16.0	
Delay (s)	65.2	23.7		37.9	65.2		31.6	24.6		18.3	48.1	
Level of Service	E	C		D	E		C	C		B	D	
Approach Delay (s)		47.9			61.7			25.5			47.5	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	109.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

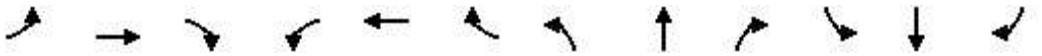
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	54	21	345	170	77	17	608	287	77	857	56
Future Volume (vph)	22	54	21	345	170	77	17	608	287	77	857	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1764		1750	1756		1750	3332		1750	3468	
Flt Permitted	0.59	1.00		0.47	1.00		0.20	1.00		0.18	1.00	
Satd. Flow (perm)	1085	1764		872	1756		374	3332		329	3468	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	25	61	24	388	191	87	19	683	322	87	963	63
RTOR Reduction (vph)	0	15	0	0	16	0	0	45	0	0	4	0
Lane Group Flow (vph)	25	70	0	388	262	0	19	960	0	87	1022	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.3	8.3		31.2	31.2		49.3	46.7		54.5	49.3	
Effective Green, g (s)	8.3	8.3		31.2	31.2		49.3	46.7		54.5	49.3	
Actuated g/C Ratio	0.08	0.08		0.31	0.31		0.50	0.47		0.55	0.50	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	147		441	552		222	1570		255	1725	
v/s Ratio Prot		0.04		c0.17	0.15		0.00	0.29		c0.02	c0.29	
v/s Ratio Perm	0.02			c0.11			0.04			0.17		
v/c Ratio	0.28	0.48		0.88	0.47		0.09	0.61		0.34	0.59	
Uniform Delay, d1	42.6	43.3		30.1	27.3		13.5	19.5		12.6	17.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	2.4		17.8	0.6		0.2	1.8		0.8	1.5	
Delay (s)	44.3	45.8		47.9	28.0		13.7	21.2		13.4	19.3	
Level of Service	D	D		D	C		B	C		B	B	
Approach Delay (s)		45.4			39.6			21.1			18.8	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	99.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	676	215	41	1234	197	222	462	20	279	807	95
Future Volume (vph)	81	676	215	41	1234	197	222	462	20	279	807	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	3373		1750	3424		1750	3478		1750	3445	
Flt Permitted	0.07	1.00		0.24	1.00		0.11	1.00		0.34	1.00	
Satd. Flow (perm)	127	3373		446	3424		199	3478		629	3445	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.99	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	719	229	44	1246	210	236	491	21	297	859	101
RTOR Reduction (vph)	0	24	0	0	11	0	0	2	0	0	7	0
Lane Group Flow (vph)	86	924	0	44	1445	0	236	510	0	297	953	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	63.0	63.0		54.0	54.0		51.9	37.0		50.1	36.1	
Effective Green, g (s)	63.0	63.0		54.0	54.0		51.9	37.0		50.1	36.1	
Actuated g/C Ratio	0.48	0.48		0.42	0.42		0.40	0.28		0.39	0.28	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	123	1634		185	1422		257	989		363	956	
v/s Ratio Prot	0.03	c0.27			c0.42		c0.11	0.15		0.09	c0.28	
v/s Ratio Perm	0.31			0.10			0.26			0.23		
v/c Ratio	0.70	0.57		0.24	1.02		0.92	0.52		0.82	1.00	
Uniform Delay, d1	29.9	23.8		24.7	38.0		35.8	39.0		31.5	46.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.9	0.5		0.7	28.1		34.7	1.9		13.4	28.3	
Delay (s)	45.9	24.2		25.3	66.1		70.4	40.9		44.9	75.2	
Level of Service	D	C		C	E		E	D		D	E	
Approach Delay (s)		26.0			64.9			50.2			68.0	
Approach LOS		C			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↱			↱
Traffic Volume (veh/h)	0	946	1742	37	0	64
Future Volume (Veh/h)	0	946	1742	37	0	64
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1028	1893	40	0	70
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		250	233			
pX, platoon unblocked	0.74				0.76	0.74
vC, conflicting volume	1893				2256	651
vC1, stage 1 conf vol					1913	
vC2, stage 2 conf vol					343	
vCu, unblocked vol	998				1301	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	91
cM capacity (veh/h)	513				220	807

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	343	343	343	757	757	419	70
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	40	70
cSH	1700	1700	1700	1700	1700	1700	807
Volume to Capacity	0.20	0.20	0.20	0.45	0.45	0.25	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.9
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.9
Approach LOS							A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	42	912	14	116	826
Future Volume (Veh/h)	11	42	912	14	116	826
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	46	991	15	126	898
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			359			
pX, platoon unblocked						
vC, conflicting volume	1700	503			1006	
vC1, stage 1 conf vol	998					
vC2, stage 2 conf vol	701					
vCu, unblocked vol	1700	503			1006	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	91			82	
cM capacity (veh/h)	243	514			684	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	58	661	345	126	449	449
Volume Left	12	0	0	126	0	0
Volume Right	46	0	15	0	0	0
cSH	418	1700	1700	684	1700	1700
Volume to Capacity	0.14	0.39	0.20	0.18	0.26	0.26
Queue Length 95th (m)	3.6	0.0	0.0	5.1	0.0	0.0
Control Delay (s)	15.0	0.0	0.0	11.4	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	15.0	0.0		1.4		
Approach LOS	C					

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	45.4%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	R	L	T	R
Maximum Queue (m)	104.7	111.4	111.3	43.8	37.0	41.3	24.8	57.7	36.8	53.8	61.2	21.2
Average Queue (m)	24.9	70.6	68.4	16.9	19.3	23.5	8.7	24.2	10.8	22.0	25.2	6.8
95th Queue (m)	62.2	100.5	98.3	33.7	32.1	37.7	19.7	47.1	25.9	40.7	49.7	16.0
Link Distance (m)		319.7	319.7		232.1	232.1		210.3			335.2	335.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	80.0			80.0			60.0		30.0	50.0		
Storage Blk Time (%)		5						6	0	0	1	
Queuing Penalty (veh)		8						15	0	1	2	

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	L
Maximum Queue (m)	9.4	43.0	51.2	52.7	9.5	24.3	14.7	21.6	8.3	7.8	30.2	49.5
Average Queue (m)	2.0	14.7	17.0	19.7	2.3	11.0	4.6	6.6	0.5	2.2	1.7	24.2
95th Queue (m)	7.7	34.0	40.9	41.2	8.3	21.8	12.9	17.2	3.6	7.7	14.6	41.8
Link Distance (m)		218.9	218.9	218.9						126.7		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0				30.0				30.0		40.0	40.0
Storage Blk Time (%)		1				0					0	2
Queuing Penalty (veh)		0				0					0	0

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	SB
Directions Served	TR
Maximum Queue (m)	8.1
Average Queue (m)	2.0
95th Queue (m)	7.6
Link Distance (m)	81.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	26.2	100.6	82.2	67.8	67.5	63.7	51.8	41.5	34.5	42.0	48.5	74.4
Average Queue (m)	13.4	59.1	48.5	34.3	36.5	33.7	27.9	15.8	14.0	21.6	19.9	35.0
95th Queue (m)	23.3	87.2	74.0	59.8	57.9	54.3	47.6	32.1	27.2	37.1	38.2	58.6
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0				90.0				80.0			140.0
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	65.9	58.0
Average Queue (m)	36.1	33.8
95th Queue (m)	56.5	54.4
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	64.6	79.1	17.9	35.3	19.0	49.8	43.4	12.8	45.2	63.2
Average Queue (m)	39.3	30.8	4.1	18.2	5.0	26.1	20.0	2.3	20.0	29.2
95th Queue (m)	61.9	59.1	12.5	31.2	14.3	43.7	36.7	9.0	39.0	52.2
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	10	2	0	8		1			0	
Queuing Penalty (veh)	20	7	0	2		0			0	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	18.6	33.0	44.5	25.6	2.0	35.4	45.0	14.0	31.2	39.5
Average Queue (m)	4.6	12.8	19.3	7.1	0.1	13.2	17.3	3.4	7.1	9.6
95th Queue (m)	12.6	26.3	36.8	17.8	0.9	29.3	36.6	10.0	21.6	26.1
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)		0				0			0	
Queuing Penalty (veh)		0				0			0	

Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	55.1	98.7	86.2	17.0	60.1	55.8	36.0	48.3	52.5	64.7	53.8	45.7
Average Queue (m)	15.5	59.5	51.8	6.4	36.2	28.8	14.9	24.8	28.2	28.6	25.4	19.6
95th Queue (m)	36.8	85.8	79.0	14.1	54.8	50.2	28.3	44.5	49.1	49.9	45.2	38.0
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			70.0			70.0			90.0		
Storage Blk Time (%)		15			0							
Queuing Penalty (veh)		13			0							

Intersection: 9: Mapleview Dr W & West Access

Movement	SB
Directions Served	R
Maximum Queue (m)	15.9
Average Queue (m)	0.9
95th Queue (m)	7.7
Link Distance (m)	39.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Essa Rd & North Access

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (m)	17.6	14.7
Average Queue (m)	9.2	5.1
95th Queue (m)	15.2	13.2
Link Distance (m)	47.4	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		50.0
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 69

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (m)	55.1	78.7	74.8	96.0	138.8	139.9	25.4	50.3	125.0	55.0	63.0	75.0
Average Queue (m)	24.2	48.5	44.7	46.9	84.6	87.9	0.8	12.5	46.9	18.2	25.7	35.6
95th Queue (m)	45.1	71.8	69.8	95.3	137.4	137.3	17.9	30.2	90.7	49.8	47.6	61.8
Link Distance (m)		319.7	319.7		232.1	232.1	232.1		210.3			335.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	80.0			80.0				60.0		30.0	50.0	
Storage Blk Time (%)		0		0	12				22	0	1	3
Queuing Penalty (veh)		0		1	32				62	1	2	4

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	SB
Directions Served	R
Maximum Queue (m)	51.9
Average Queue (m)	22.8
95th Queue (m)	43.9
Link Distance (m)	335.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	L
Maximum Queue (m)	25.9	38.0	44.2	39.3	9.5	73.4	69.4	60.1	29.3	12.8	32.6	47.4
Average Queue (m)	11.2	12.7	13.9	14.7	1.0	36.1	27.7	23.0	12.7	3.3	1.6	22.0
95th Queue (m)	22.6	28.3	34.4	31.8	5.6	60.3	54.3	44.3	24.1	10.2	14.2	39.7
Link Distance (m)		218.9	218.9	218.9						126.7		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0				30.0				30.0		40.0	40.0
Storage Blk Time (%)	0	0				6			0		0	2
Queuing Penalty (veh)	0	0				0			0		0	0

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	SB
Directions Served	TR
Maximum Queue (m)	12.1
Average Queue (m)	2.9
95th Queue (m)	9.5
Link Distance (m)	81.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	84.6	117.8	107.9	81.3	114.8	139.7	133.5	152.4	94.4	132.1	135.3	79.4
Average Queue (m)	38.9	73.3	63.8	52.8	55.5	96.1	86.7	89.9	60.0	70.2	71.2	39.8
95th Queue (m)	72.3	107.0	96.3	82.7	102.7	133.6	122.2	135.4	102.9	121.7	116.2	67.4
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)								0				
Queuing Penalty (veh)								0				
Storage Bay Dist (m)	150.0				90.0				80.0			140.0
Storage Blk Time (%)					1	11			11	3		
Queuing Penalty (veh)					5	27			31	7		

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	70.6	72.5
Average Queue (m)	43.3	42.2
95th Queue (m)	65.0	66.3
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	64.4	94.0	44.8	86.2	49.1	84.0	67.0	44.9	125.6	144.1
Average Queue (m)	42.3	35.7	13.9	49.7	18.0	39.2	33.3	7.4	68.5	84.8
95th Queue (m)	65.4	69.1	38.4	84.8	35.6	64.8	55.6	29.7	112.8	130.3
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	14	3	2	45	0	7			25	
Queuing Penalty (veh)	29	8	4	17	1	6			5	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	13.4	32.3	89.2	64.7	19.6	77.9	79.0	41.0	79.2	87.0
Average Queue (m)	3.3	12.2	43.3	23.2	1.5	30.5	36.4	9.1	34.6	39.6
95th Queue (m)	9.7	25.8	74.2	46.2	10.9	60.4	68.4	29.3	75.7	80.6
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)		0	0			4			6	
Queuing Penalty (veh)		0	0			1			4	

Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	54.2	95.5	97.5	94.8	256.8	260.8	85.2	87.7	76.7	85.4	111.6	110.9
Average Queue (m)	15.0	57.9	54.1	23.0	208.3	204.5	44.4	37.6	40.3	41.8	72.1	70.0
95th Queue (m)	33.8	84.2	85.5	79.3	298.9	297.8	75.2	66.3	63.4	72.4	104.0	101.7
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)					25	27						
Queuing Penalty (veh)					0	0						
Storage Bay Dist (m)	50.0			70.0			70.0			90.0		
Storage Blk Time (%)	0	13			56		4	1		0	3	
Queuing Penalty (veh)	0	9			21		9	1		1	8	

Intersection: 9: Mapleview Dr W & West Access

Movement	WB	SB
Directions Served	T	R
Maximum Queue (m)	1.9	6.7
Average Queue (m)	0.1	0.3
95th Queue (m)	1.3	4.2
Link Distance (m)	218.9	39.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Essa Rd & North Access

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (m)	23.4	4.1	25.0
Average Queue (m)	9.0	0.2	11.2
95th Queue (m)	18.2	2.0	20.8
Link Distance (m)	47.4	335.2	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			50.0
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 299

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	L	T	R	L	T	R
Maximum Queue (m)	93.5	115.9	109.4	48.5	47.8	49.8	24.2	61.0	50.6	49.2	58.8	28.3
Average Queue (m)	27.0	74.0	70.7	18.2	21.5	24.4	8.5	26.8	12.8	22.2	27.3	6.9
95th Queue (m)	63.5	105.3	102.0	37.7	37.9	40.2	20.2	48.8	30.0	40.3	48.8	18.0
Link Distance (m)		319.7	319.7		232.1	232.1		210.3			335.2	335.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	80.0			80.0			60.0		30.0	50.0		
Storage Blk Time (%)	0	5						8	0	0	1	
Queuing Penalty (veh)	0	9						22	1	1	2	

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	L
Maximum Queue (m)	11.0	48.3	56.6	54.0	10.4	29.9	26.7	24.5	9.5	10.3	15.8	40.7
Average Queue (m)	2.3	14.9	17.3	19.7	3.1	12.2	6.2	7.0	1.0	3.2	1.0	20.1
95th Queue (m)	8.7	35.4	41.9	40.3	9.8	24.8	18.5	18.1	5.3	9.6	11.0	35.3
Link Distance (m)		218.9	218.9	218.9						126.7		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0				30.0				30.0		40.0	40.0
Storage Blk Time (%)		1				0					0	1
Queuing Penalty (veh)		0				0					0	0

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	SB
Directions Served	TR
Maximum Queue (m)	9.2
Average Queue (m)	2.1
95th Queue (m)	7.8
Link Distance (m)	81.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	33.2	99.7	90.0	72.3	82.9	66.3	55.4	45.4	34.4	51.5	49.7	79.1
Average Queue (m)	15.0	66.9	58.0	42.1	43.3	35.4	28.8	18.2	15.1	24.6	23.8	40.4
95th Queue (m)	27.2	96.5	85.2	67.2	69.9	56.6	49.6	35.3	28.6	43.6	43.4	64.9
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0				90.0				80.0			140.0
Storage Blk Time (%)					0	0						
Queuing Penalty (veh)					0	0						

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	65.9	70.4
Average Queue (m)	39.7	38.8
95th Queue (m)	61.3	61.3
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	64.5	93.2	16.7	41.3	20.0	54.0	43.3	11.9	55.2	71.2
Average Queue (m)	41.8	37.1	5.2	19.9	5.5	31.1	22.8	2.8	23.1	33.7
95th Queue (m)	64.4	73.4	13.8	36.4	15.1	48.8	39.8	10.1	43.3	57.7
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	11	3	0	12		2			1	
Queuing Penalty (veh)	26	10	0	2		1			0	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	17.9	34.6	47.9	23.7	1.9	37.8	64.6	15.4	32.8	36.4
Average Queue (m)	4.6	13.8	19.3	8.3	0.1	15.2	22.6	3.3	7.6	10.8
95th Queue (m)	12.8	28.4	36.6	19.0	0.9	32.6	47.5	10.0	23.3	28.7
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)		0				0			0	
Queuing Penalty (veh)		0				0			0	

Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	69.4	95.2	88.6	19.8	63.0	60.1	34.9	48.0	50.9	60.4	49.1	43.6
Average Queue (m)	19.7	63.0	57.4	6.3	37.4	30.8	16.3	24.7	28.3	27.8	27.7	20.8
95th Queue (m)	46.5	87.0	83.6	15.9	56.4	52.8	30.5	42.9	47.7	49.6	46.2	37.2
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			70.0			70.0			90.0		
Storage Blk Time (%)	0	18			0							
Queuing Penalty (veh)	0	18			0							

Intersection: 9: Mapleview Dr W & West Access

Movement	SB
Directions Served	R
Maximum Queue (m)	14.2
Average Queue (m)	0.5
95th Queue (m)	5.4
Link Distance (m)	39.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Essa Rd & North Access

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (m)	19.1	11.7
Average Queue (m)	8.7	5.0
95th Queue (m)	16.2	12.6
Link Distance (m)	47.4	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		50.0
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 93

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (m)	57.6	82.9	83.1	104.9	217.5	222.7	118.5	54.5	133.9	55.0	58.7	106.6
Average Queue (m)	24.8	51.6	48.5	72.9	125.5	129.3	26.8	15.4	55.1	25.3	28.4	43.1
95th Queue (m)	45.0	76.2	75.4	127.2	218.9	219.9	138.2	38.6	104.3	61.0	54.3	83.9
Link Distance (m)		319.7	319.7		232.1	232.1	232.1		210.3			335.2
Upstream Blk Time (%)					2	3	2					
Queuing Penalty (veh)					12	18	11					
Storage Bay Dist (m)	80.0			80.0				60.0		30.0	50.0	
Storage Blk Time (%)		1		2	30				28	0	6	5
Queuing Penalty (veh)		1		12	84				88	2	19	9

Intersection: 1: Essa Rd & Mapleview Dr W

Movement	SB
Directions Served	R
Maximum Queue (m)	60.5
Average Queue (m)	27.9
95th Queue (m)	50.7
Link Distance (m)	335.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	L
Maximum Queue (m)	23.6	39.7	38.0	41.0	8.1	76.6	67.4	58.2	26.9	11.3	7.3	39.1
Average Queue (m)	9.8	12.7	13.2	15.9	0.4	34.2	26.8	21.2	13.4	3.2	0.2	19.6
95th Queue (m)	19.5	28.5	31.2	33.3	3.4	58.1	50.3	42.2	24.4	9.6	5.2	34.3
Link Distance (m)		218.9	218.9	218.9						126.7		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0				30.0				30.0		40.0	40.0
Storage Blk Time (%)	0	1				6			0		0	0
Queuing Penalty (veh)	0	0				0			0		0	0

Intersection: 2: Hollyholme Farm Rd/MCC Access & Mapleview Dr W

Movement	SB
Directions Served	TR
Maximum Queue (m)	11.2
Average Queue (m)	3.5
95th Queue (m)	10.3
Link Distance (m)	81.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	121.9	139.4	124.2	102.2	114.9	194.2	183.0	191.5	104.9	183.8	169.4	125.0
Average Queue (m)	66.1	91.0	79.5	65.1	83.0	137.2	126.7	128.9	74.0	100.5	101.8	65.0
95th Queue (m)	136.2	132.8	110.1	92.5	140.5	199.3	183.7	190.6	115.7	174.0	165.9	112.1
Link Distance (m)						189.6	189.6	189.6		282.0	282.0	
Upstream Blk Time (%)						3	1	3				
Queuing Penalty (veh)						0	0	0				
Storage Bay Dist (m)	150.0				90.0				80.0			140.0
Storage Blk Time (%)	3	0			4	28			9	20		0
Queuing Penalty (veh)	12	0			17	69			28	61		0

Intersection: 4: Veterans Dr & Mapleview Dr W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	87.9	92.2
Average Queue (m)	52.3	52.7
95th Queue (m)	79.0	80.6
Link Distance (m)	230.8	230.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Essa Rd & Mapleton Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	64.6	116.4	44.8	115.4	60.2	82.8	74.3	56.1	142.2	147.6
Average Queue (m)	47.5	44.5	14.7	57.6	20.4	44.0	39.3	7.4	75.9	90.0
95th Queue (m)	69.4	93.6	38.8	96.8	41.0	69.6	62.5	31.2	122.3	136.3
Link Distance (m)		187.7		164.2					567.9	567.9
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				0						
Storage Bay Dist (m)	40.0		20.0		40.0			40.0		
Storage Blk Time (%)	20	4	3	51	1	10			26	
Queuing Penalty (veh)	46	13	8	21	3	11			6	

Intersection: 7: Essa Rd & Harvie Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	14.2	34.2	86.8	58.8	20.0	73.4	82.7	56.9	92.2	95.7
Average Queue (m)	3.5	12.0	45.4	24.8	1.6	30.5	36.9	8.2	39.3	44.1
95th Queue (m)	10.2	25.8	76.6	45.8	10.8	59.5	70.5	26.7	84.7	89.9
Link Distance (m)		158.2		198.5		567.9	567.9		300.4	300.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		100.0		40.0			40.0		
Storage Blk Time (%)		0				5			8	
Queuing Penalty (veh)		0				1			6	

Intersection: 8: Essa Rd & Ferndale Dr/Veterans Dr

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (m)	74.2	101.2	97.6	94.8	253.8	246.6	89.3	88.3	71.9	114.9	177.0	158.7
Average Queue (m)	24.6	60.4	57.3	23.0	193.4	187.3	45.1	38.7	42.8	61.9	98.4	96.6
95th Queue (m)	48.9	87.4	85.9	80.1	291.7	290.6	75.5	68.2	66.6	115.0	146.7	140.8
Link Distance (m)		192.9	192.9		245.8	245.8		300.4	300.4		282.6	282.6
Upstream Blk Time (%)					22	24						
Queuing Penalty (veh)					0	0						
Storage Bay Dist (m)	50.0			70.0			70.0			90.0		
Storage Blk Time (%)	0	12			49		3	1		1	14	
Queuing Penalty (veh)	0	10			20		6	1		3	38	

Intersection: 9: Mapleview Dr W & West Access

Movement	WB	WB	WB	SB
Directions Served	T	T	TR	R
Maximum Queue (m)	26.1	33.5	21.2	21.3
Average Queue (m)	3.4	4.2	2.4	1.2
95th Queue (m)	26.5	29.9	20.6	10.6
Link Distance (m)	218.9	218.9	218.9	39.8
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10: Essa Rd & North Access

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (m)	19.5	25.3
Average Queue (m)	8.7	10.9
95th Queue (m)	17.1	20.8
Link Distance (m)	47.4	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		50.0
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 640

Appendix H:
Traffic Signal Warrants

8-HOUR TRAFFIC SIGNAL WARRANT

Project & No.: Mapleview & Essa Development 422433

GENERAL INFORMATION

Analyst	MJB	**Jurisdiction/Area**	Barrie	**Date**	01 Dec 2022
Agency or Company	Tatham Engineering Ltd	**East-West Street**	North Access		
Analysis Period	2027 Total Traffic	**North-South Street**	Essa Road		
Flow Conditions	Restricted flow (urban)	**Major Street**	Essa Road		
T Intersection	Yes	**Approach Lanes per Direction**	1		
		Hours of Traffic Volume Data	AM & PM peaks only		

Additional Comments

JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME

JUSTIFICATION	GUIDANCE	HOUR ENDING: AM Peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	PM Peak	No. of hours with compliance: 100%	80%+	
1A	TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total)	**1021**	**643**	**643**	**643**	**643**	**643**	**643**	**1551**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	89%	89%	89%	89%	89%	89%	100%	2	8	92%
1B	TRAFFIC VOLUME ON MINOR STREET (vph) (2 way Total)	**58**	**24**	**24**	**24**	**24**	**24**	**24**	**37**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 170 (full intersection) OR VOL x 100 / 255 (tee intersection)	23%	9%	9%	9%	9%	9%	9%	15%	0	0	12%
(RESTRICTED FLOW)	**BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS**											**NO**
SIGNAL JUSTIFICATION 1:	**LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS**											**NO**

JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC

JUSTIFICATION	GUIDANCE	HOUR ENDING: Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	No. of hours with compliance: 100%	80%+	
2A	MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total)	**963**	**619**	**619**	**619**	**619**	**619**	**619**	**1514**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	86%	86%	86%	86%	86%	86%	100%	2	8	90%
2B	CROSSING TRAFFIC VOLUME (vph) (2 way Total)	**14**	**6**	**6**	**6**	**6**	**6**	**6**	**9**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 75	19%	8%	8%	8%	8%	8%	8%	12%	0	0	10%
(RESTRICTED FLOW)	**BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS**											**NO**
SIGNAL JUSTIFICATION 2:	**LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS**											**NO**

JUSTIFICATION 3 - COLLISION EXPERIENCE

	Preceding Months	Number of Collisions	% Fulfillment
A. Number of reportable collisions susceptible to prevention by a traffic signal.	1 - 12	-	-
	13 - 24	-	-
	25 - 36	-	-
	annual average	-	-
B. Adequate trial of less restrictive remedies has failed to reduce collision frequency.	☐ YES	☐ NO	n/a
C. Either Justification 1 (Minimum Vehicular Volume) or Justification 2 (Delay to Cross Traffic) satisfied to 80% or more.	☐ YES	☐ NO	n/a
SIGNAL JUSTIFICATION 3: **ALL OF 3A, 3B & 3C FULFILLED TO 100%?**	**NO**		

JUSTIFICATION 4 - COMBINATION JUSTIFICATION

JUSTIFICATION SATISFIED 80% OR MORE			Two Justifications Satisfied 80% or more
Justification 1	-	Minimum Vehicle Volume	NO
Justification 2	-	Delay to Cross Traffic	NO
Justification 3	-	Collision Experience	-

NO

JUSTIFICATION SUMMARY

ARE TRAFFFIC SIGNALS JUSTIFIED FOR THE INTERSECTION IN QUESTION? **NO**

8-HOUR TRAFFIC SIGNAL WARRANT

Project & No.: Mapleview & Essa Development 422433

GENERAL INFORMATION

Analyst	MJB	**Jurisdiction/Area**	Barrie	**Date**	01 Dec 2022
Agency or Company	Tatham Engineering Ltd	**East-West Street**	North Access		
Analysis Period	2031 Total Traffic	**North-South Street**	Essa Road		
Flow Conditions	Restricted flow (urban)	**Major Street**	Essa Road		
T Intersection	Yes	**Approach Lanes per Direction**	1		
		Hours of Traffic Volume Data	AM & PM peaks only		

Additional Comments

JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME

JUSTIFICATION	GUIDANCE	HOUR ENDING: AM Peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	PM Peak	No. of hours with compliance: 100%	80%+	
1A	TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total)	**1209**	**757**	**757**	**757**	**757**	**757**	**757**	**1820**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
1B	TRAFFIC VOLUME ON MINOR STREET (vph) (2 way Total)	**75**	**34**	**34**	**34**	**34**	**34**	**34**	**60**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 170 (full intersection) OR VOL x 100 / 255 (tee intersection)	29%	13%	13%	13%	13%	13%	13%	24%	0	0	17%
(RESTRICTED FLOW)	**BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS**											**NO**
SIGNAL JUSTIFICATION 1:	**LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS**											**NO**

JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC

JUSTIFICATION	GUIDANCE	HOUR ENDING: Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	No. of hours with compliance: 100%	80%+	
2A	MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total)	**1134**	**724**	**724**	**724**	**724**	**724**	**724**	**1760**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
2B	CROSSING TRAFFIC VOLUME (vph) (2 way Total)	**16**	**23**	**23**	**23**	**23**	**23**	**23**	**78**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 75	21%	31%	31%	31%	31%	31%	31%	100%	1	1	39%
(RESTRICTED FLOW)	**BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS**											**NO**
SIGNAL JUSTIFICATION 2:	**LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS**											**NO**

JUSTIFICATION 3 - COLLISION EXPERIENCE

	Preceding Months	Number of Collisions	% Fulfillment
A. Number of reportable collisions susceptible to prevention by a traffic signal.	1 - 12	-	-
	13 - 24	-	-
	25 - 36	-	-
	annual average	-	-
B. Adequate trial of less restrictive remedies has failed to reduce collision frequency.	☐ YES	☐ NO	n/a
C. Either Justification 1 (Minimum Vehicular Volume) or Justification 2 (Delay to Cross Traffic) satisfied to 80% or more.	☐ YES	☐ NO	n/a
SIGNAL JUSTIFICATION 3: **ALL OF 3A, 3B & 3C FULFILLED TO 100%?**	**NO**		

JUSTIFICATION 4 - COMBINATION JUSTIFICATION

JUSTIFICATION SATISFIED 80% OR MORE			Two Justifications Satisfied 80% or more
Justification 1	-	Minimum Vehicle Volume	NO
Justification 2	-	Delay to Cross Traffic	NO
Justification 3	-	Collision Experience	-

NO

JUSTIFICATION SUMMARY

ARE TRAFFFIC SIGNALS JUSTIFIED FOR THE INTERSECTION IN QUESTION? **NO**

8-HOUR TRAFFIC SIGNAL WARRANT

Project & No.: Mapleview & Essa Development 422433

GENERAL INFORMATION

Analyst	MJB	**Jurisdiction/Area**	Barrie	**Date**	01 Dec 2022
Agency or Company	Tatham Engineering Ltd	**East-West Street**	North Access		
Analysis Period	2036 Total Traffic	**North-South Street**	Essa Road		
Flow Conditions	Restricted flow (urban)	**Major Street**	Essa Road		
T Intersection	Yes	**Approach Lanes per Direction**	1		
		Hours of Traffic Volume Data	AM & PM peaks only		

Additional Comments

JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME

JUSTIFICATION	GUIDANCE	HOUR ENDING: AM Peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	PM Peak	No. of hours with compliance: 100%	80%+	
1A	TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total)	**1242**	**778**	**778**	**778**	**778**	**778**	**778**	**1870**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
1B	TRAFFIC VOLUME ON MINOR STREET (vph) (2 way Total)	**71**	**32**	**32**	**32**	**32**	**32**	**32**	**57**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 170 (full intersection) OR VOL x 100 / 255 (tee intersection)	28%	13%	13%	13%	13%	13%	13%	22%	0	0	16%
(RESTRICTED FLOW)	**BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS**											**NO**
SIGNAL JUSTIFICATION 1:	**LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS**											**NO**

JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC

JUSTIFICATION	GUIDANCE	HOUR ENDING: Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	No. of hours with compliance: 100%	80%+	
2A	MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total)	**1171**	**746**	**746**	**746**	**746**	**746**	**746**	**1813**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
2B	CROSSING TRAFFIC VOLUME (vph) (2 way Total)	**15**	**22**	**22**	**22**	**22**	**22**	**22**	**74**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 75	20%	30%	30%	30%	30%	30%	30%	98%	0	1	37%
(RESTRICTED FLOW)	**BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS**											**NO**
SIGNAL JUSTIFICATION 2:	**LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS**											**NO**

JUSTIFICATION 3 - COLLISION EXPERIENCE

	Preceding Months	Number of Collisions	% Fulfillment
A. Number of reportable collisions susceptible to prevention by a traffic signal.	1 - 12	-	-
	13 - 24	-	-
	25 - 36	-	-
	annual average	-	-
B. Adequate trial of less restrictive remedies has failed to reduce collision frequency.	☐ YES	☐ NO	n/a
C. Either Justification 1 (Minimum Vehicular Volume) or Justification 2 (Delay to Cross Traffic) satisfied to 80% or more.	☐ YES	☐ NO	n/a
SIGNAL JUSTIFICATION 3: **ALL OF 3A, 3B & 3C FULFILLED TO 100%?**	**NO**		

JUSTIFICATION 4 - COMBINATION JUSTIFICATION

JUSTIFICATION SATISFIED 80% OR MORE			Two Justifications Satisfied 80% or more
Justification 1	-	Minimum Vehicle Volume	NO
Justification 2	-	Delay to Cross Traffic	NO
Justification 3	-	Collision Experience	-

NO

JUSTIFICATION SUMMARY

ARE TRAFFFIC SIGNALS JUSTIFIED FOR THE INTERSECTION IN QUESTION? **NO**

8-HOUR TRAFFIC SIGNAL WARRANT

Project & No.: Mapleview & Essa Development 422433

GENERAL INFORMATION

Analyst	MJB	**Jurisdiction/Area**	Barrie	**Date**	01 Dec 2022
Agency or Company	Tatham Engineering Ltd	**East-West Street**	North Access		
Analysis Period	2041 Total Traffic	**North-South Street**	Essa Road		
Flow Conditions	Restricted flow (urban)	**Major Street**	Essa Road		
T Intersection	Yes	**Approach Lanes per Direction**	1		
		Hours of Traffic Volume Data	AM & PM peaks only		

Additional Comments

JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME

JUSTIFICATION	GUIDANCE	HOUR ENDING: AM Peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	PM Peak	No. of hours with compliance: 100%	80%+	
1A	TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total)	**1275**	**799**	**799**	**799**	**799**	**799**	**799**	**1921**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
1B	TRAFFIC VOLUME ON MINOR STREET (vph) (2 way Total)	**67**	**30**	**30**	**30**	**30**	**30**	**30**	**53**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 170 (full intersection) OR VOL x 100 / 255 (tee intersection)	26%	12%	12%	12%	12%	12%	12%	21%	0	0	15%
(RESTRICTED FLOW)	**BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS**											**NO**
SIGNAL JUSTIFICATION 1:	**LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS**											**NO**

JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC

JUSTIFICATION	GUIDANCE	HOUR ENDING: Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	No. of hours with compliance: 100%	80%+	
2A	MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total)	**1208**	**769**	**769**	**769**	**769**	**769**	**769**	**1868**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
2B	CROSSING TRAFFIC VOLUME (vph) (2 way Total)	**14**	**6**	**6**	**6**	**6**	**6**	**6**	**11**	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 75	19%	8%	8%	8%	8%	8%	8%	15%	0	0	10%
(RESTRICTED FLOW)	**BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS**											**NO**
SIGNAL JUSTIFICATION 2:	**LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS**											**NO**

JUSTIFICATION 3 - COLLISION EXPERIENCE

	Preceding Months	Number of Collisions	% Fulfillment
A. Number of reportable collisions susceptible to prevention by a traffic signal.	1 - 12	-	-
	13 - 24	-	-
	25 - 36	-	-
	annual average	-	-
B. Adequate trial of less restrictive remedies has failed to reduce collision frequency.	☐ YES	☐ NO	n/a
C. Either Justification 1 (Minimum Vehicular Volume) or Justification 2 (Delay to Cross Traffic) satisfied to 80% or more.	☐ YES	☐ NO	n/a
SIGNAL JUSTIFICATION 3: **ALL OF 3A, 3B & 3C FULFILLED TO 100%?**	**NO**		

JUSTIFICATION 4 - COMBINATION JUSTIFICATION

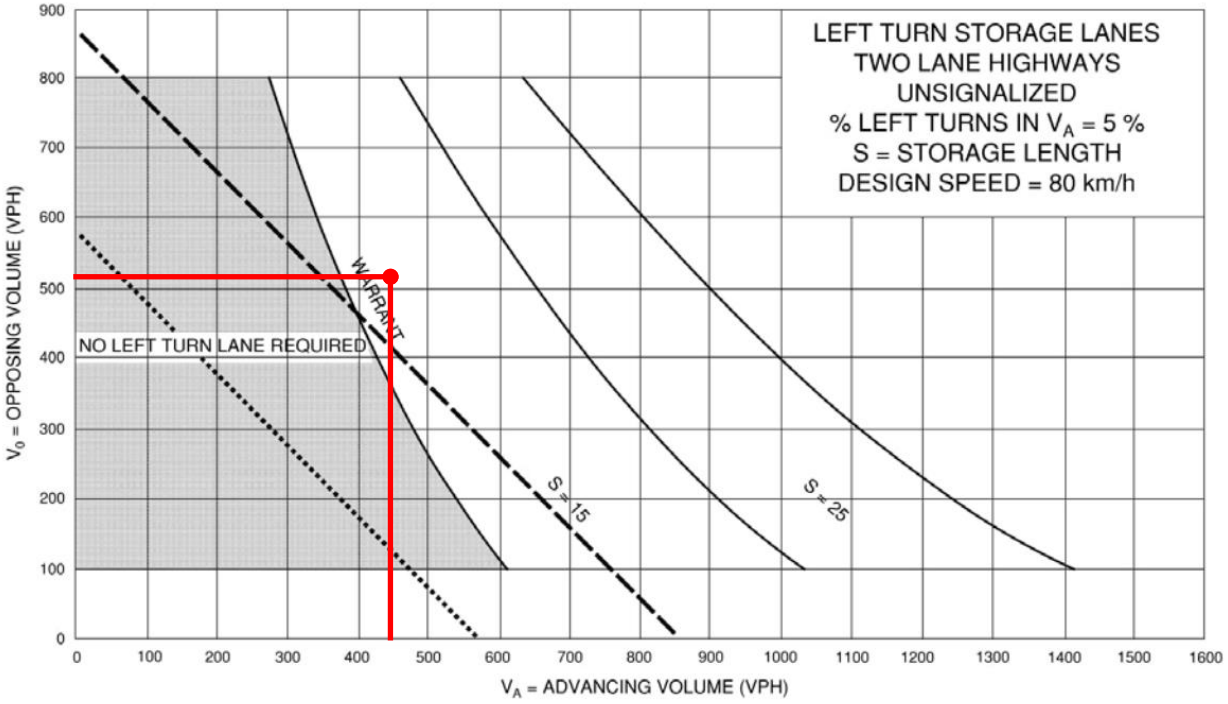
JUSTIFICATION SATISFIED 80% OR MORE			Two Justifications Satisfied 80% or more
Justification 1	-	Minimum Vehicle Volume	NO
Justification 2	-	Delay to Cross Traffic	NO
Justification 3	-	Collision Experience	-

NO

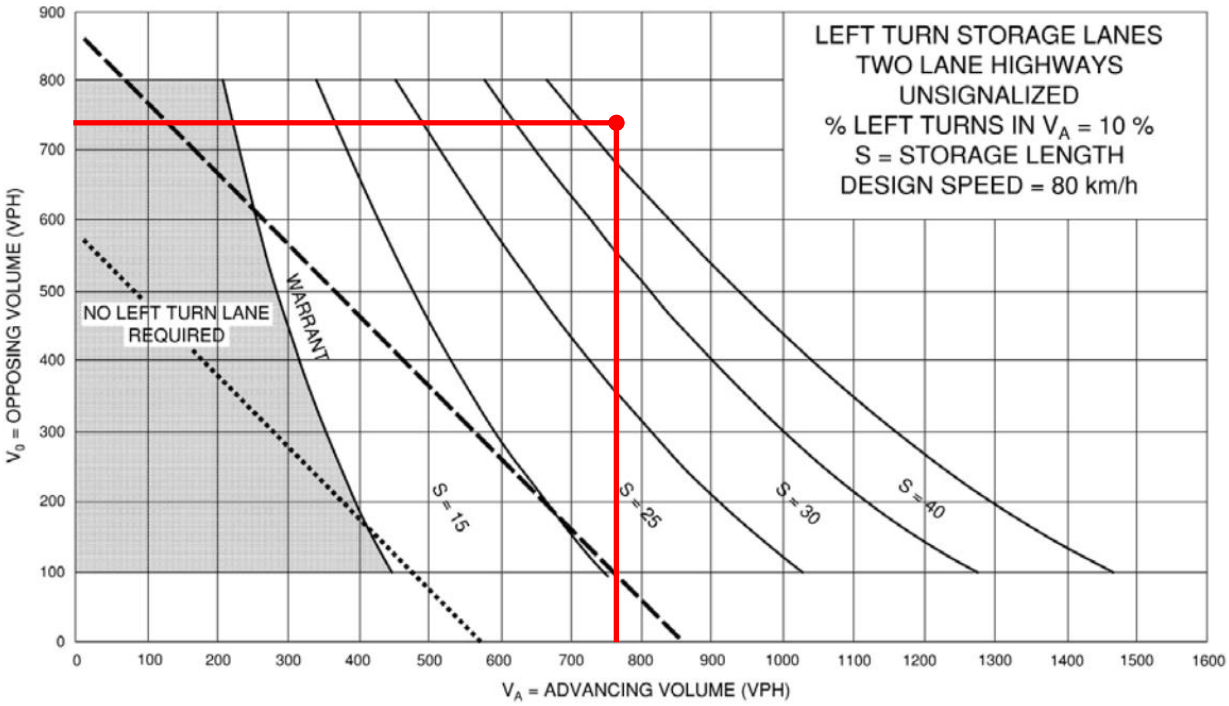
JUSTIFICATION SUMMARY

ARE TRAFFFIC SIGNALS JUSTIFIED FOR THE INTERSECTION IN QUESTION? **NO**

Appendix I:
Left Turn Lane Warrants



AM Peak Hour



PM Peak Hour