McLeod Meadows Residential Development

Traffic Impact Study

FINAL

November 5, 2024

Revision to June 2, 2023, Report

Prepared for:

800460 Ontario Ltd.

arva

CANADA'S BEST MANAGED COMPANIES Platinum member

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June 2, 2023 RVA 226547

800460 Ontario Ltd.
Eric Henry
1701 Thorold Townline Road
Niagara Falls, Ontario, L2E 6S5

Attention: Eric Henry

Dear Mr. Henry:

Re: McLeod Meadows Proposed Residential Development, Niagara Falls, Ontario

RVA is pleased to submit the following Final Traffic Impact Study for the proposed Residential development to be located at 9304 McLeod Road in the City of Niagara Falls.

If there is any query related to this report, please feel free to contact the undersigned at 905 685 5049 ext. 4237 or by email at MDiMaria@rvanderson.com.

Yours very truly,

R.V. ANDERSON ASSOCIATES LIMITED

Matthew Di Maria, C.E.T., RSP1, CAPM.
Transportation Planner

Encls.

McLeod Meadows Residential Development

Traffic Impact Study

Final

(Revision to June 2, 2023 Report)

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RVA 226547

November 5, 2024

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1.0 INTRODUCTION

1.1 Study Objective

R.V. Anderson Associates Limited (RVA) was retained by 800460 Ontario Ltd. to complete a Traffic Impact Study (TIS) for the proposed McLeod Meadows residential development, located at 9304 McLeod Road in the City of Niagara Falls.

The study includes the estimation of traffic generation from the proposed development, traffic analysis, and the completion of intersection capacity analyses for the study area intersections under the existing and future conditions scenarios.

1.2 Development Location

The proposed development will be located in an existing farm parcel in the southeast corner of the Beechwood Road and McLeod Road intersection. Access to the property will be provided by one (1) street on McLeod Road and one (1) street on Beechwood Road. Surrounding the site is mainly farmland, except for a BMX park and car lot to the west of the proposed development location.

McLeod Road provides a direct link to the Queen Elizabeth Way (QEW) located east of the development. The location of the proposed development is shown in **Figure 1-1**.

1.3 Study Area

Based on consultations with City staff, traffic analysis was completed for the following study intersections:

- McLeod Road at Street B;
- Beechwood Road at Street A;
- Beechwood Road at McLeod Road;
- Garner Road at McLeod Road; and
- Kalar Road at McLeod Road.

Figure 1-1 – Development Location

2.0 EXISTING CONDITIONS

2.1 Existing Road Network

McLeod Road within the study area is an east-west arterial roadway under the jurisdiction of the City of Niagara Falls. The roadway has a two-lane rural cross section within the vicinity of the proposed development but transitions into a four-lane urban cross-section at the Kalar road intersection. The roadway has posted speeds of 50km/h and 80km/h to the east and west of Garner Road, respectively. Near the site, it has generally straight and level horizontal and vertical alignments, respectively. At its signalized intersection with Kalar Road, it has auxiliary left-turn lanes in the eastbound and westbound directions and a westbound right-turn auxiliary lane.

Beechwood Road is a north-south arterial roadway under the jurisdiction of the City of Niagara Falls, with a two-lane rural cross-section. The posted speed limit is 80km/h and 60km/h to the north and south of McLeod Road. Near the site, it has a generally straight and level horizontal and vertical alignment, respectively.

Garner Road is a north-south collector roadway under the jurisdiction of the City of Niagara Falls and has a posted speed limit of 60km/h. The road has a two-lane rural cross-section north of McLeod Road and a two-lane urban cross section south of McLeod Road. Near the site, it has a generally straight and level horizontal and vertical alignments, respectively.

Kalar Road is a north-south arterial roadway under the jurisdiction of the City of Niagara Falls and has a posted speed limit of 50km/h. The road has four-lanes north of McLeod Road, and two-lanes south of McLeod Road. The horizontal alignment of Kalar is generally straight within the study area, and its vertical alignment is generally flat with a slight upgrade to the north of the study area. There are northbound and southbound left turn auxiliary lanes at the intersection with McLeod Road.

The study area existing intersection lane configurations and controls are shown in **Figure 2-1.**

2.2 Active Transportation Facilities

Sidewalks are currently provided along both sides of McLeod Road east of Garner Road. Sidewalks are also provided on both sides of Kalar Road and on the east side of Garner Road.

Dedicated Cycling facilities are currently located in the east/west direction along McLeod Road east of Kalar Road and in the north/south direction along Kalar Road north of McLeod Road.

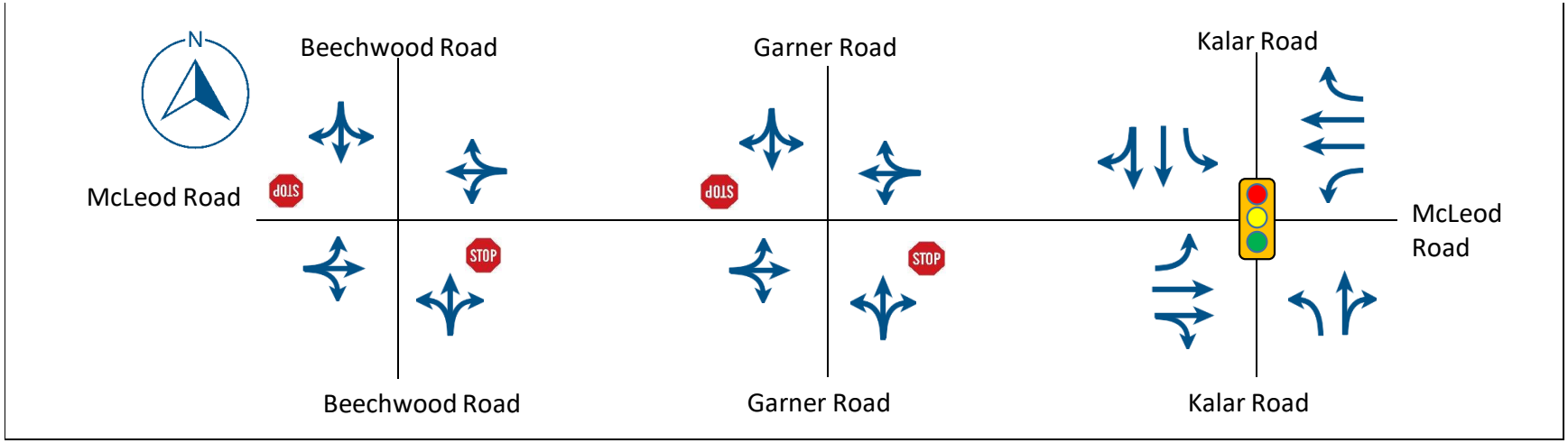


Figure 2-1 – Existing Intersection Lane Configurations and Controls

2.3 Transit Services

The nearest existing stops are located 900m and 1.1km west of the development along Garner and McLeod Road with transit routes described below. These routes connect users to the Canadian Drive Transit Hub.

Northbound stop on Garner Road, 900m west of proposed development

- Routes 113 and 213 – Operate Monday to Sunday travelling from the Canadian Drive Transit Hub to Mt. Carmel Plaza.

Westbound stop on McLeod Road 1.1km west of proposed development

- Routes 105 and 205 – Operate Monday to Sunday travelling from the Canadian Drive Transit Hub to Niagara Square.

2.4 Existing 2022 Traffic Data

Intersection turning movement count (TMC) data was collected in October 2022 and is provided in **Appendix A**.

An analysis of the data determined that the overall weekday peak hours for the study area road network generally occurred between 7:45 a.m. and 8:45 a.m. during the a.m. peak hour and between 4:30 p.m. and 5:30 p.m. during the p.m. peak hour.

The existing intersection volumes for the weekday a.m. and p.m. peak hours are presented in **Figure 2-2**.

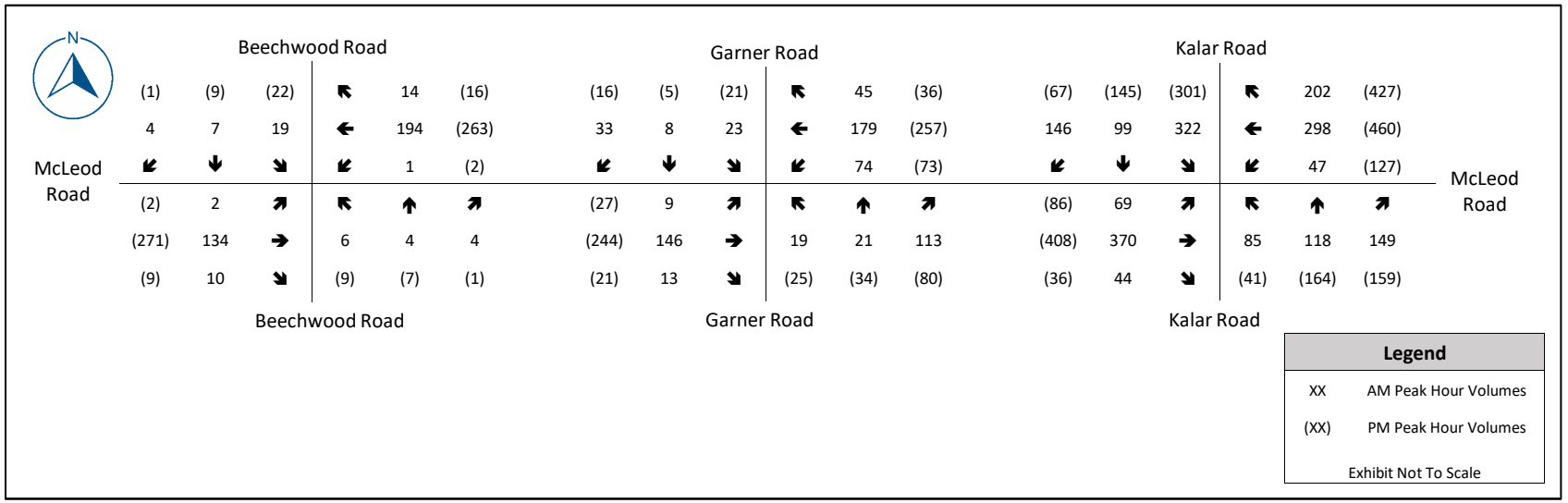


Figure 2-2 –Existing 2022 Traffic Volumes

3.0 FUTURE BACKGROUND TRAFFIC

3.1 Study Horizon Year

Based on requirements in the City of Niagara Falls Guidelines, the analysis adopted future planning horizons of 2027 representing the assumed opening year and 2032 representing five (5) years post opening year.

3.2 Study Area Transportation Network Improvements

3.2.1 McLeod Road West EA

An Environmental Assessment (EA) is planned to be completed for McLeod Road between Kalar Road and Thorold Townline Road and is expected to begin sometime in the near future. The EA study may result in recommendations for future geometric modifications based on a more comprehensive analysis of future traffic demands for the area and the resulting traffic operational conditions.

Additionally, the City noted that traffic signals are planned by the City for the McLeod Road and Garner Road intersection. This is consistent with the City's Development Charges Bylaw. This intersection has been modeled as a signalized intersection for all future horizon years, with 15m left turn lanes added at all approaches of the intersection assuming these will be provided to avoid the conflicts of the simultaneously left turn vehicles within the intersection under the permitted phases. The signal timing plan for this intersection has been assumed based on the existing traffic volumes.

3.3 Future Background Traffic Volumes

3.3.1 Planned Developments

Per the City's direction, the following background developments have been included in the projected future background volumes, with other approved developments expected to be captured within the assumed corridor growth. The background developments and general locations in the context of the surrounding road network are described below**:**

- Forestview Subdivision development, west of Garner Road;
- Splendor Subdivision development, west of Kalar Road to the south; and
- Panoramic Properties Residential Development, northeast corner of Kalar Road and McLeod Road.

The estimated weekday a.m. and p.m. peak hour generated traffic for each of the considered background developments are shown in **Appendix B**.

3.3.2 Future Background Traffic Volumes

Annual growth rates for the study area were provided through consultation with City Staff. An annual growth rate of 2% was applied to all intersection turning movements.

The resulting 2027 and 2032 future background volumes, excluding traffic generated from the considered background developments, are presented in **Figure 3-1** and **Figure 3-2,** respectively**.**

3.3.3 Future Total Background Traffic Volumes

The future total background intersection volumes for the 2027 and 2032 horizon years were estimated by adding future background traffic volumes and the estimated background development traffic for each horizon year. The resulting 2027 and 2032 future total background intersection volumes, for the weekday a.m. and p.m. peak hours, are presented in **Figure 3-3** and **Figure 3-4,** respectively.

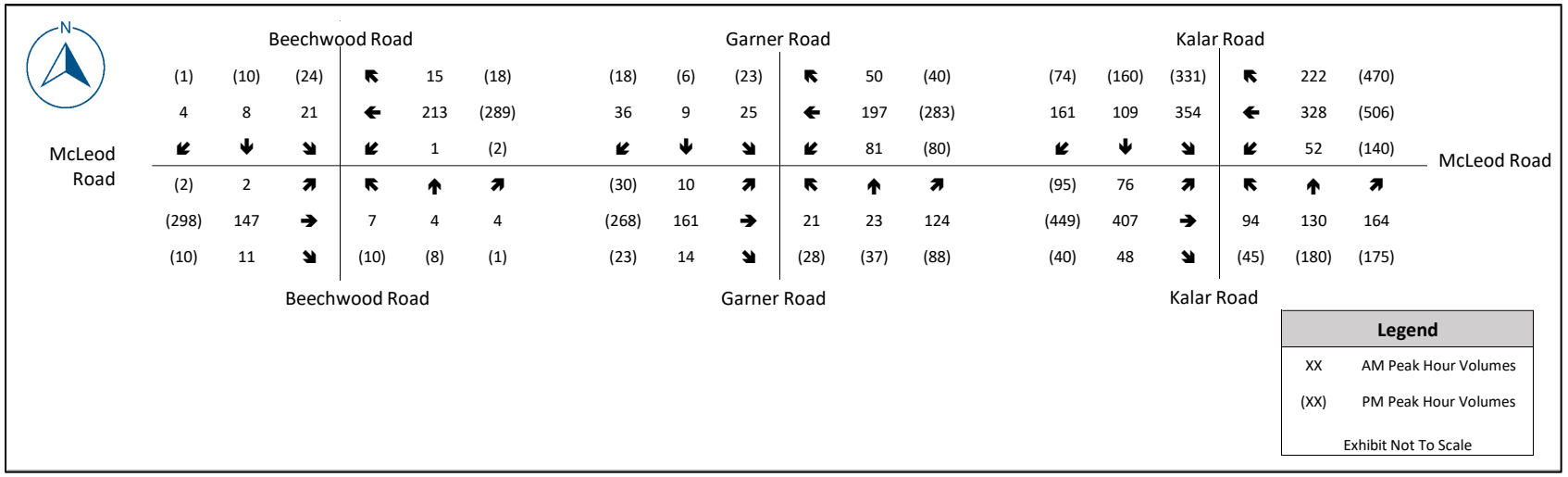


Figure 3-1 – 2027 Future Background Traffic Volumes

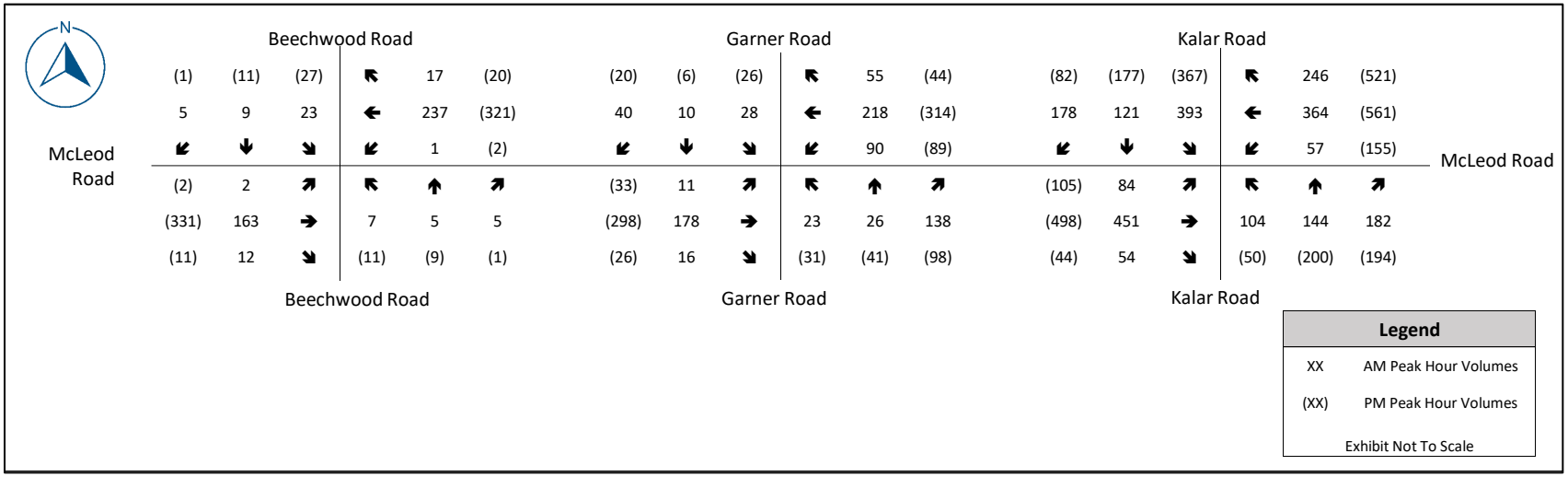


Figure 3-2 – 2032 Future Background Traffic Volumes

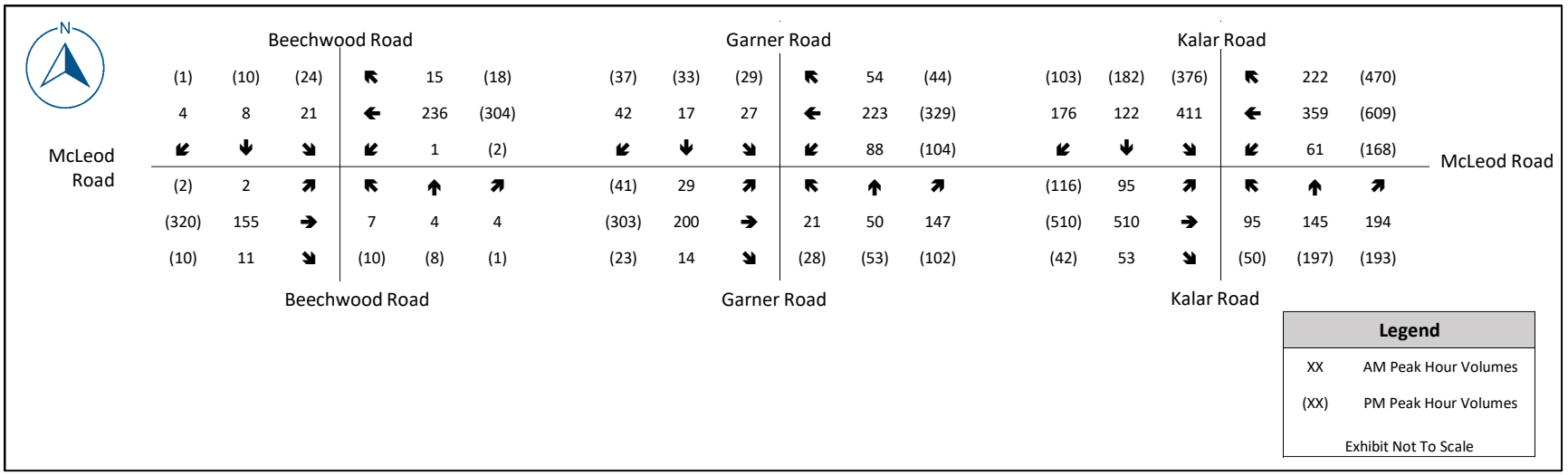


Figure 3-3 – 2027 Future Total Background Traffic Volumes

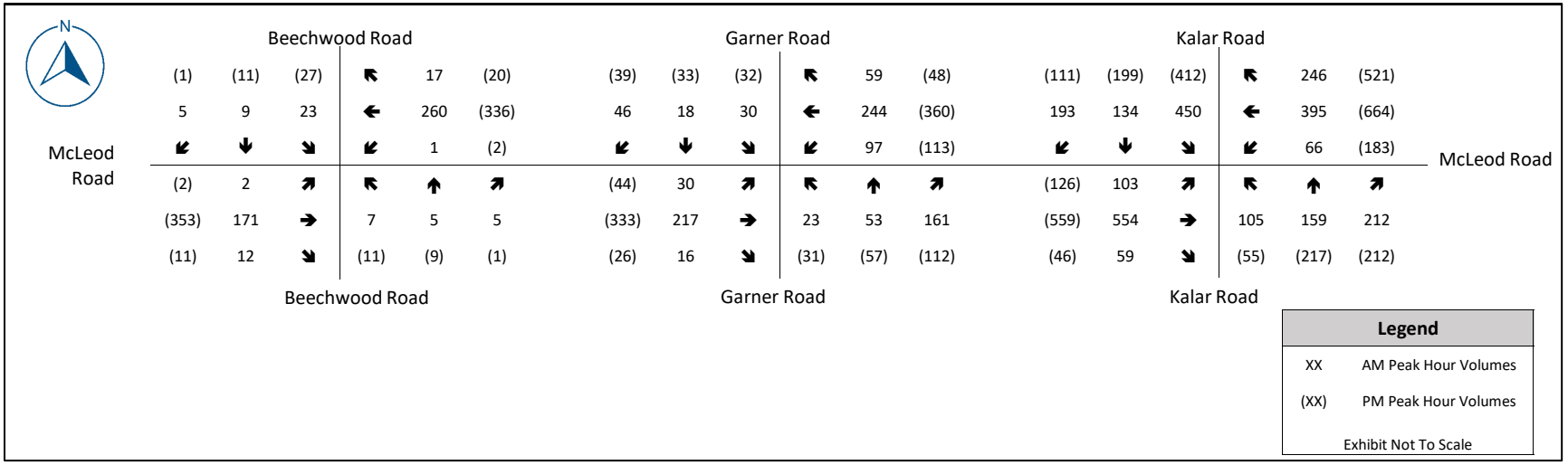


Figure 3-4 – 2032 Future Total Background Traffic Volume

4.0 SITE GENERATED TRAFFIC

4.1 Site Plan

The proposed site plan shown in **Figure 4-1** was prepared by Upper Canada Consultants. The plan shows a proposed subdivision including 149 single family homes and 394 townhomes.

The proposed vehicular access configurations are as follows:

- Three-leg unsignalized intersection with McLeod Road and Street 'B', approximately 385 metres east of the Beechwood Road and McLeod Road intersection, measured pavement edge to pavement edge.
- Three-leg unsignalized intersection with Beechwood Road and Street 'A', approximately 250 meters south of the Beechwood Road and McLeod Road intersection, measured pavement edge to pavement edge.

4.1.1 Access Review

4.1.1.1 McLeod Road Access

Based on the proposed site plan presented in **Figure 4-1**, a single local road connection to the development will be provided along McLeod Road. Known as Street 'B', this roadway connection will create a new full-movement unsignalized T-intersection with McLeod Road. The horizontal and vertical alignment along McLeod Road is generally straight and flat; therefore, no sightline concerns exist.

Per TAC guidelines, the minimum required spacing between intersections along an arterial roadway is 200 metres (Section 9.4.2.1). Given the proposed Street 'B' intersection will be located approximately 385 metres east of the Beechwood Road intersection, the intersection meets the suggested TAC spacing guidelines.

4.1.1.2 Beechwood Road Accesses

Based on the proposed site plan presented in **Figure 4-1**, there will be one (1) local roadway access to the development known as Steet 'A'. Given the existing horizontal and vertical alignment along Beechwood Road being generally straight and flat; no sightline concerns are expected to exist at each of the proposed access connections to the development.

Street 'A'

Street 'A' will be located approximately 250 metres south of McLeod Road creating a full-movement unsignalized T-intersection with Beechwood Road. As mentioned in the previous section, the minimum required spacing between intersections along an arterial roadway based on

the TAC Manual is 200 metres (Section 9.4.2.1). Therefore, the location of the Street ‘A’ intersection meets the suggested TAC spacing guidelines.

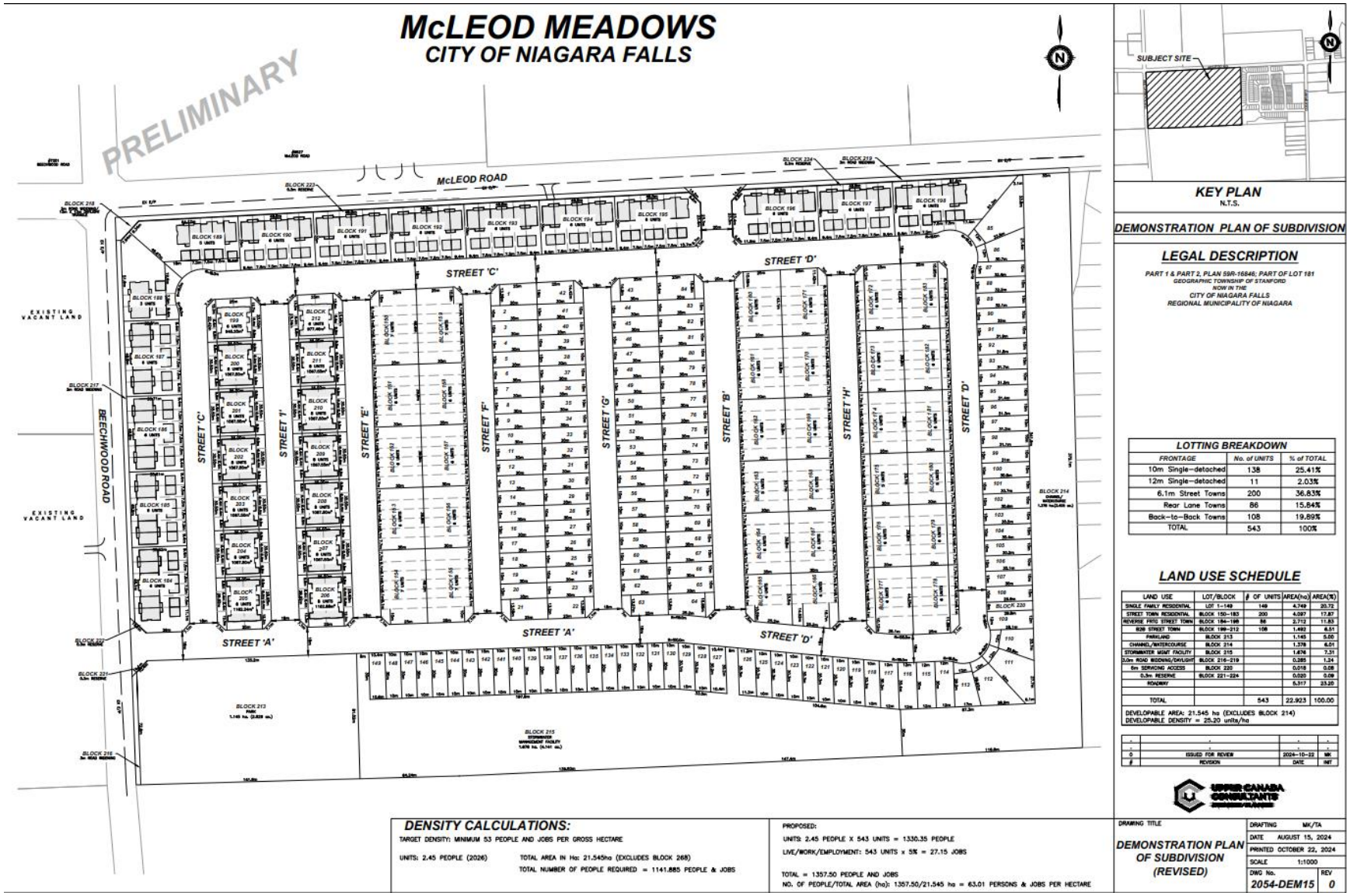


Figure 4-1 – Development Site Plan

4.2 Site Trip Generation

Automobile trip generation for the proposed development during peak periods of the adjacent street traffic was estimated by using the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th edition) methodology for Single Family Detached (LUC 210), Single Family Attached (LUC 215) and Multifamily Housing Low-Rise (LUC 220).

As presented in **Table 4-1,** the proposed residential development is projected to generate approximately 252 total two-way trips during the weekday a.m. peak hour (62 inbound and 190 outbound), and 335 total two-way trips during the weekday p.m. peak hour (211 inbound and 124 outbound)

Table 4-1: Trip Generation

LUC	Building Use	Units	Peak Hours	Total Trip Generation (Baseline Vehicle/Person Trips)	Directional Distribution		Directional Site Trips	
					In	Out	In	Out
210	Single Family Home	149	AM	107	25%	75%	**27**	**80**
			PM	145	63%	37%	**91**	**54**
220	Multi-Family Residential (Low-rise)	394	AM	145	24%	76%	**35**	**110**
			PM	190	63%	37%	**120**	**70**
					Total	**AM**	**62**	**190**
						PM	**211**	**124**

4.3 Site Trip Distribution and Assignment

Given the majority of trips generated by the site during the weekday a.m. and p.m. peak hours will primarily be commuter trips, given the residential nature of the development, 2016 Transportation Tomorrow Survey (TTS) commuter data was reviewed to estimate the distribution of the site generated traffic to the surrounding road network. **Table 4-2** outlines the estimated trip distribution assumptions for the site generated trips, which is based on the analyzed TTS data provided in **Appendix C**.

Table 4-2: Trip Distribution

Direction	Distribution Percentages
McLeod Road (East) Includes traffic to QEW South, QEW North, and McLeod East	70%
McLeod Road (West)	5%
Beechwood Road (North)	20%
Beechwood Road (South)	5%
Total	**100%**

The site generated traffic has been assigned to individual turning movements at the study area intersections based on the trip generation estimates and the trip distribution assumptions. The estimated peak hour site generated traffic for the proposed residential development is shown in **Figure 4-2**.

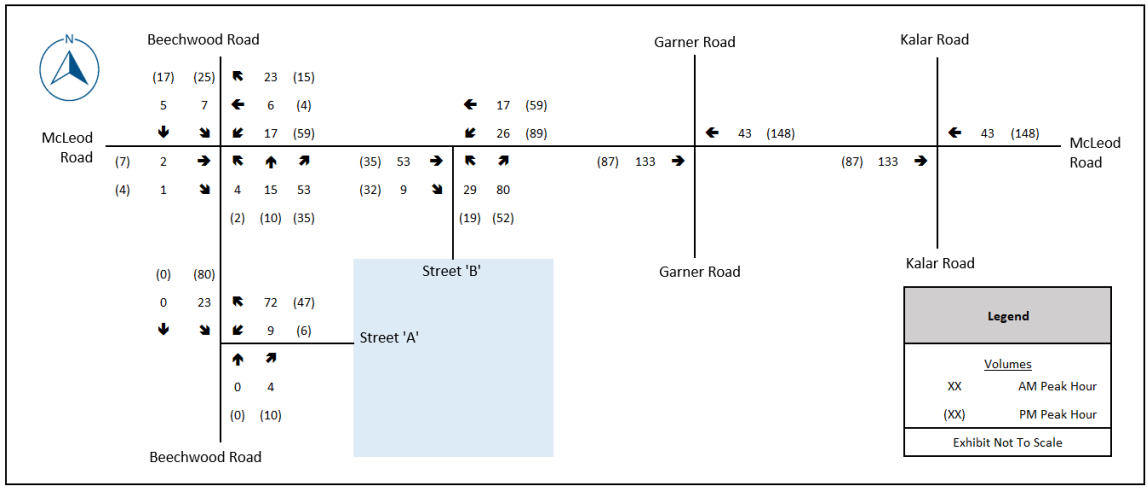


Figure 4-2 – Proposed Residential Development – Site Trips

5.0 FUTURE TOTAL TRAFFIC

5.1 Future Total Traffic Volumes

The future total intersection volumes for the 2027 and 2032 horizon years were developed by combining the estimated site generated traffic from the residential development with the future total background traffic at each horizon year. The resulting 2027 and 2032 future total intersection volumes, for weekday a.m. and p.m. peak hours, are presented in **Figure 5-1** and **Figure 5-2,** respectively.

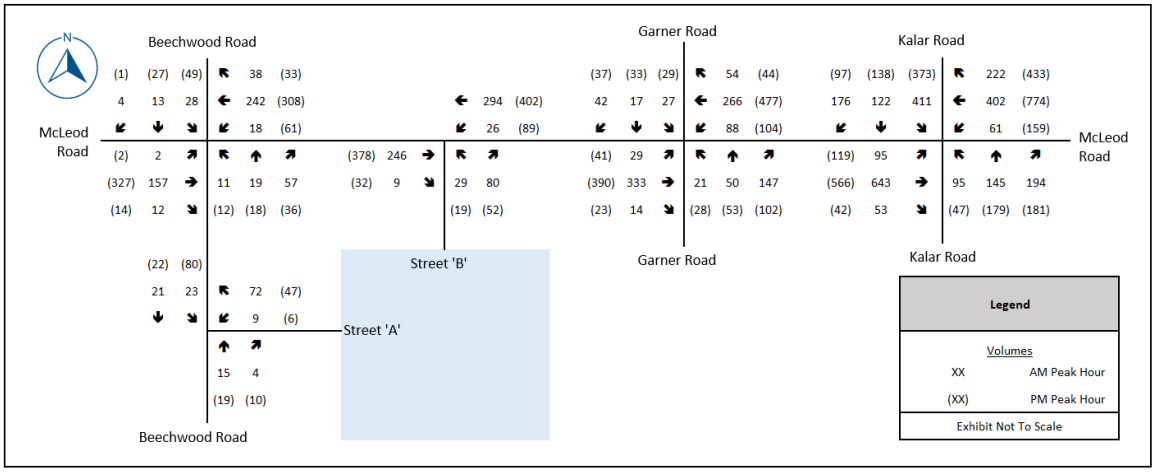


Figure 5-1 – 2027 Future Total Traffic Volumes

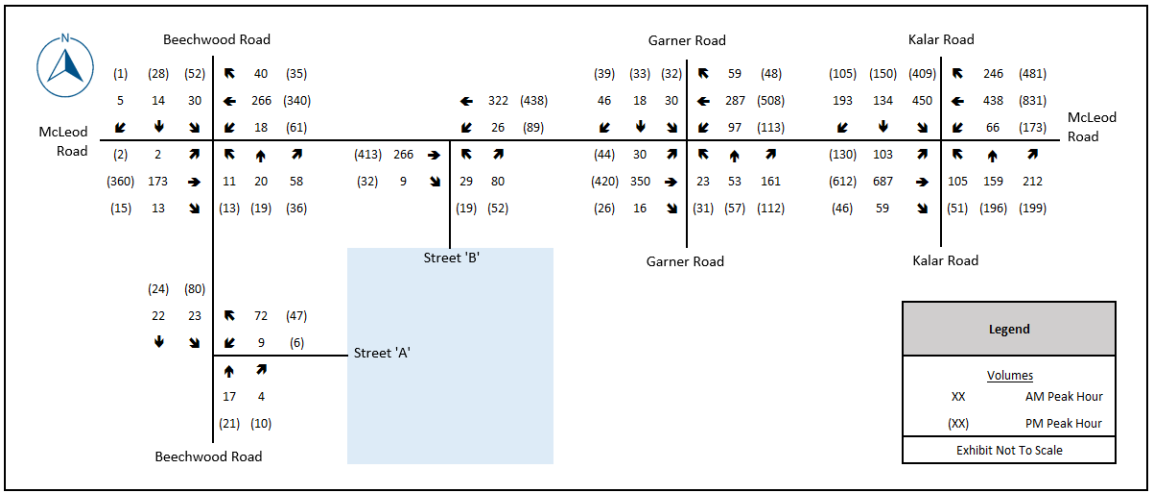


Figure 5-2 – 2032 Future Total Traffic Volumes

6.0 GEOMETRIC AND INTERSECTION CONTROL MODIFICATIONS

6.1 MTO Left-Turn Lane Warrant

A left-turn lane warrant was completed for the Beechwood Road and McLeod Road intersection, and the McLeod Road and Street 'B' intersection. Warrants were completed with the future background total and future total volumes from the a.m. and p.m. peak hour volumes.

Per the results of the left turn lane warrants found in **Appendix D,** a westbound left turn lane is warranted at the intersection of Beechwood Road and McLeod Road as a result of the 2032 background traffic volumes. The westbound left movement at the intersection of

McLeod Road and Street 'B' warrants a left turn lane as a result of the site generated traffic.

To avoid operational and driver sightline concerns with the implementation of a westbound left turn lane at McLeod and Beechwood, it is recommended that an eastbound left turn lane also be implemented. This will provide geometric design uniformity through the intersection and eliminate any safety concerns with left turning vehicles.

The implementation of left turn auxiliary lanes should be considered when the City completes the Environmental Assessment in the near future.

6.2 Right-Turn Lane Consideration

A right-turn lane was considered for the McLeod Road and Street 'B' intersection. The MTO Geometric Design Manual indicates that a right-turn lane should be considered where right-turning vehicles significantly impede the traffic flow of the through moving vehicles. The consideration for the right turn lane at the Street 'B' access will be determined during the operational analysis.

6.3 MTO Signal Warrant

An MTO signal warrant was completed for the Beechwood Road and McLeod Road intersection. The warrant was completed with volumes from the 2032 horizon year. Per the results of the signal warrant found in **Appendix D,** no signalization is warranted at this intersection.

6.4 Intersection Modifications

Based on the geometric and intersection control warrants and considerations, the proposed lane configurations to be used in the operation analysis are shown in **Figure 6-1.**

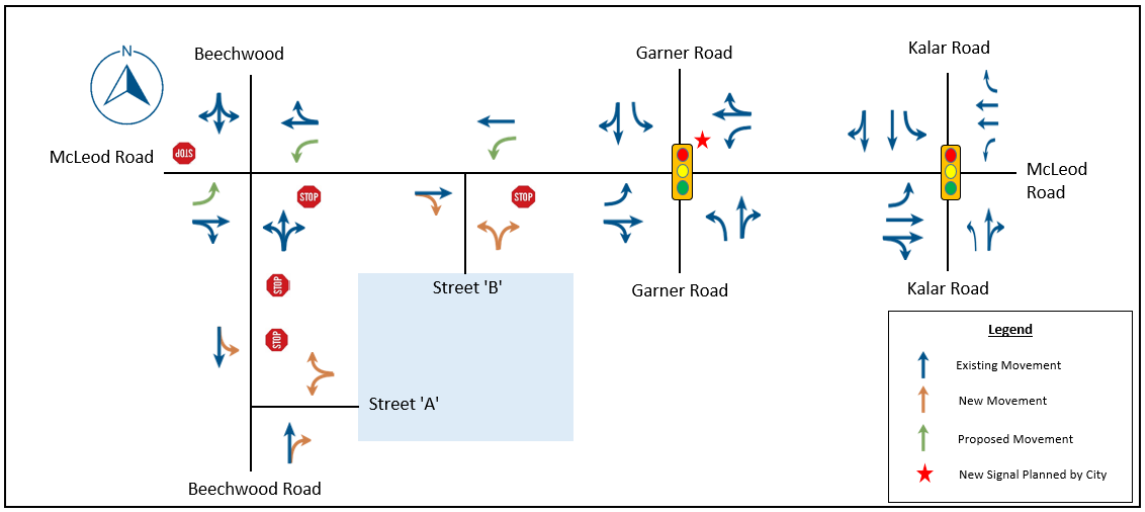


Figure 6-1 – Proposed Intersection Lane Configurations and Controls

7.0 OPERATION ANALYSIS

7.1 Intersection Operation Analysis

Synchro macroscopic traffic analysis software was utilized to analyse the intersections. Key performance measures such as Level of Service (LOS), volume-to-capacity ratio (v/c ratio), and 95th percentile queuing was reported, and are defined below:

- **Average vehicle control delay** is used to characterize LOS for the entire intersection, an approach, or movement. Delay quantifies the variations in travel time and is also a surrogate measure of driver discomfort and fuel consumption.
- **V/C ratio** quantifies the degree to which the capacity of each signal phase is utilized by a defined lane group. The City of Niagara Falls TIS guidelines indicate capacity concerns for through or shared through movements and exclusive turning movements at a v/c ratio of 0.85 and 0.95 respectively.
- **95th percentile queue** is the queue length which is expected to be exceeded only 5% of the time; it is common practice to identify preferred storage length requirements for auxiliary turn lanes at signalized intersections based on estimated peak hour 95th percentile queueing.

Table 7-1 identifies the control delay thresholds (seconds of delay per vehicle) for each LOS based on Highway Capacity Manual (HCM) 2000 methodology.

Table 7-1: Characteristics of Level of Service at Intersections

LEVEL OF SERVICE (LOS)	CONTROL DELAY (seconds / vehicle)	
	SIGNALIZED INTERSECTION	UNSIGNALIZED INTERSECTION
A	≤ 10	≤ 10
B	> 10 to 20	> 10 to 15
C	> 20 to 35	> 15 to 25
D	> 35 to 55	> 25 to 35
E	> 55 to 80	> 35 to 50
F	> 80	> 50

Existing signal timing plans for the signalized study area intersections were provided by the City for use in the analysis; and are provided in **Appendix A.** The signal timing plan for the McLeod Road and Garner Road was assumed. Signal timings have been adjusted for future background scenarios as required and are consistent with the respective future total scenarios.

Highway Capacity Manual (HCM) 2000 output reports from are provided in **Appendix E.**

7.2 Kalar Road at McLeod Road

Table 7-2: Signalized Capacity Analysis Results – Kalar Road at McLeod Road

SCENARIO	MOVE.	WEEKDAY A.M. PEAK HOUR			WEEKDAY P.M. PEAK HOUR			AVAILABL E STORAGE LENGTH (M)
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	
2022 Existing	EBL	0.24	B	15	0.34	B	21	25
	EBTTR	0.34	B	35	0.31	B	39	-
	WBL	0.24	B	16	0.49	C	39	40
	WBTT	0.39	C	34	0.51	C	59	-
	WBR	0.22	B	22	0.59	C	69	15
	NBL	0.31	B	23	0.12	C	15	20
	NBTR	0.54	C	52	0.60	C	75	-
	SBL	0.79	C	65	0.82	C	90	130
	SBTTR	0.12	A	10	0.09	B	13	-
	HCM LOS	B			C			
2027 Future Total Background	EBL	0.50	C	26	0.66	C	34	25
	EBTTR	0.55	C	66	0.41	C	59	-
	WBL	0.38	C	24	0.69	D	58	40
	WBTT	0.49	C	48	0.64	C	84	-
	WBR	0.31	C	33	0.70	C	96	15
	NBL	0.35	C	30	0.17	C	19	20
	NBTR	0.69	C	85	0.79	D	130	-
	SBL	0.79	C	105	0.88	D	116	130
	SBTTR	0.13	A	11	0.12	B	15	-
	HCM LOS	C			C			

SCENARIO	MOVE.	WEEKDAY A.M. PEAK HOUR			WEEKDAY P.M. PEAK HOUR			AVAILABL E STORAGE LENGTH (M)
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	
2027 Future Total	EBL	0.50	C	26	0.75	D	41	25
	EBTTR	0.64	C	83	0.46	C	70	-
	WBL	0.49	C	26	0.73	D	67	40
	WBTT	0.50	C	54	0.74	C	109	-
	WBR	0.32	C	36	0.71	C	105	15
	NBL	0.36	C	33	0.18	C	19	20
	NBTR	0.71	C	92	0.81	D	120	-
	SBL	0.82	C	121	0.9	D	116	130
	SBTTR	0.13	A	14	0.12	B	15	-
	HCM LOS	C			C			
2032 Future Background	EBL	0.59	C	29	0.85	E	49	25
	EBTTR	0.60	C	74	0.74	D	87	-
	WBL	0.49	C	27	0.69	C	45	40
	WBTT	0.53	C	54	0.70	C	96	-
	WBR	0.38	C	40	0.82	D	131	15
	NBL	0.40	C	36	0.18	C	20	20
	NBTR	0.75	C	102	0.84	D	132	-
	SBL	0.85	C	145	0.93	D	138	130
	SBTTR	0.14	A	14	0.13	B	16	-
	HCM LOS	C			D			
2032 Future Total	EBL	0.57	C	29	0.87	E	48	25
	EBTTR	0.68	C	93	0.82	D	111	-
	WBL	0.62	D	30	0.70	C	45	40
	WBTT	0.52	C	60	0.83	D	122	-
	WBR	0.38	C	44	0.85	D	142	15
	NBL	0.41	C	38	0.18	C	20	20
	NBTR	0.77	D	115	0.85	D	132	-
	SBL	0.89	D	157	0.95	E	139	130
	SBTTR	0.15	A	16	0.13	B	16	-
	HCM LOS	C			D			

As presented in **Table 7-2**, the intersection of McLeod Road and Kalar Road is currently operating well at LOS B and LOS C during the a.m. and p.m. peak hours, respectively. The intersection movements operate with reserve capacity and delays of LOS C or better. Almost all movements operate without queuing concerns except for the westbound-right movement during the p.m. peak hour, which has queues considerably longer than the existing storage lane.

With the addition of 2027 corridor growth and other development generated traffic, the intersection is still forecast to operate well at an LOS C during both peak hours. All movements during the a.m. peak hour are forecast to operate at an LOS C or better and with reserve capacity. All movements during the p.m. peak hour are forecast to operate at an LOS D or better and with reserve capacity. The eastbound and westbound left movements during the p.m. peak hour are forecast to have queues longer than their storage lengths. The northbound left movement is forecast have queuing concerns during the a.m. peak hour.

With the addition of site generated trips, the intersection is still forecast to operate well at an LOS C during both peak hours. All movements during the a.m. peak hour are forecast to continue operating at a LOS C or better with reserve capacity. All movements during the p.m. peak hour are forecast to continue operating at an LOS D or better with reserve capacity. No additional queuing concerns are forecast to occur with the addition of site generated traffic.

With the addition of 2032 corridor growth, the intersection is still forecast to operate well at an LOS C and LOS D during the a.m. and p.m. peak hours, respectively. All movements during the a.m. peak hour are forecast to continue operating LOS D or better with reserve capacity. All movements during the p.m. peak hour are forecast to operate at an LOS D or better, with the eastbound left movement operating at an LOS E. In addition to the previous queuing concerns noted, the southbound left movement is forecast to have queues longer than the storage length during both peak hours.

With the addition of site generated trips, the intersection is still forecast to operate well at an LOS C and LOS D during the a.m. and p.m. peak hours, respectively. All movements during the a.m. peak hour are forecast to continue operating LOS D or better with reserve capacity. All movements during the p.m. peak hour are forecast to continue operating at an LOS D or better, with the eastbound and southbound left movements operating at an LOS E. No additional queuing concerns are forecast to occur with the addition of site generated traffic.

Based on the results of the operation analysis, the site generated traffic does not result in any geometric improvements. Based on background traffic, multiple auxiliary lanes are anticipated to be increased in length.

7.3 Garner Road at McLeod Road

Table 7-3: Capacity Analysis Results – Garner Road at McLeod Road

SCENARIO	MOVE.	WEEKDAY A.M. PEAK HOUR			WEEKDAY P.M. PEAK HOUR		
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)
2022 Existing (unsignalized)	EBLTR	0.01	A	<1 vehicle	0.02	A	<1 vehicle
	WBLTR	0.06	A	<1 vehicle	0.06	A	<1 vehicle
	NBLTR	0.26	B	8	0.34	C	12
	SBLTR	0.16	B	<1 vehicle	0.16	C	<1 vehicle
2027 Future Background (Signalized)	EBL	0.06	A	<1 vehicle	0.09	A	<1 vehicle
	EBTR	0.25	A	14	0.36	A	22
	WBL	0.18	A	7	0.22	A	9
	WBTR	0.33	A	17	0.42	A	25
	NBL	0.08	A	<1 vehicle	0.11	A	<1 vehicle
	NBTR	0.25	A	9	0.24	B	11
	SBL	0.10	A	<1 vehicle	0.12	A	<1 vehicle
	SBTR	0.08	A	<1 vehicle	0.13	A	7
	HCM LOS	A			A		
2027 Future Total (Signalized)	EBL	0.06	A	<1 vehicle	0.11	A	<1 vehicle
	EBTR	0.40	A	24	0.42	A	32
	WBL	0.19	A	8	0.22	A	10
	WBTR	0.37	A	21	0.54	A	44
	NBL	0.08	A	<1 vehicle	0.12	B	7
	NBTR	0.26	A	11	0.26	B	15
	SBL	0.11	A	<1 vehicle	0.14	B	7
	SBTR	0.08	A	<1 vehicle	0.14	B	10
	HCM LOS	A			A		
2032 Future Background (Signalized)	EBL	0.07	A	<1 vehicle	0.10	A	<1 vehicle
	EBTR	0.29	A	16	0.39	A	26
	WBL	0.21	A	8	0.24	A	10
	WBTR	0.38	A	20	0.45	A	30
	NBL	0.07	A	<1 vehicle	0.13	B	<1 vehicle
	NBTR	0.25	A	11	0.26	B	13
	SBL	0.11	A	<1 vehicle	0.14	B	<1 vehicle
	SBTR	0.08	A	<1 vehicle	0.13	A	8
	HCM LOS	A			A		
2032 Future Total (Signalized)	EBL	0.07	A	<1 vehicle	0.12	A	<1 vehicle
	EBTR	0.44	A	27	0.45	A	36
	WBL	0.23	A	9	0.25	A	12
	WBTR	0.42	A	25	0.57	A	50
	NBL	0.07	A	<1 vehicle	0.14	B	8
	NBTR	0.25	A	13	0.28	B	17
	SBL	0.11	A	<1 vehicle	0.16	B	8
	SBTR	0.08	A	6	0.14	B	10
	HCM LOS	A			A		

As presented in **Table 7-3**, the unsignalized intersection of McLeod Road and Garner Road is currently operating well during both peak hours. The intersection movements operate with reserve capacity and delays at an LOS C or better. All movements operate without queuing concerns.

With the addition of 2027 corridor growth and other development generated traffic, the signalized intersection is still forecast to operate well with and without site generated

traffic, with an overall intersection LOS of A during both peak hours. All movements during the a.m. and p.m. peak hours are forecast to operate at an LOS B or better and with reserve capacity.

With the addition of 2032 corridor growth, with and without the site generated traffic, the intersection is still forecast to operate well at an LOS A for both peak hours. All movements during the a.m. and p.m. peak hours are forecast to operate at an LOS B or better and with reserve capacity.

Based on the results of the operation analysis, the site generated traffic does not result in any geometric improvements in addition to those planned by the City.

7.4 Beechwood Road at McLeod Road

Table 7-4: Unsignalized Capacity Analysis Results – Beechwood at McLeod Road

SCENARIO	MOVE.	WEEKDAY A.M. PEAK HOUR			WEEKDAY P.M. PEAK HOUR		
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)
2022 Existing	EBLTR	0.00	A	<1 vehicle	0.00	A	<1 vehicle
	WBLTR	0.00	A	<1 vehicle	0.00	A	<1 vehicle
	NBLTR	0.02	B	<1 vehicle	0.05	B	<1 vehicle
	SBLTR	0.06	B	<1 vehicle	0.09	B	<1 vehicle
2027 Future Background	EBLTR	0.00	A	<1 vehicle	0.00	A	<1 vehicle
	WBLTR	0.00	A	<1 vehicle	0.00	A	<1 vehicle
	NBLTR	0.03	B	<1 vehicle	0.06	C	<1 vehicle
	SBLTR	0.07	B	<1 vehicle	0.11	C	<1 vehicle
2027 Future Total	EBLTR	0.00	A	<1 vehicle	0.00	A	<1 vehicle
	WBLTR	0.01	A	<1 vehicle	0.06	A	<1 vehicle
	NBLTR	0.15	B	<1 vehicle	0.19	C	<1 vehicle
	SBLTR	0.12	B	<1 vehicle	0.36	D	12
2032 Future Background	EBLTR*	0.00	A	<1 vehicle	0.00	A	<1 vehicle
	WBL	0.00	A	<1 vehicle	0.00	A	<1 vehicle
	NBLTR	0.03	B	<1 vehicle	0.07	C	<1 vehicle
	SBLTR	0.08	B	<1 vehicle	0.13	C	<1 vehicle
2032 Future Total	EBLTR*	0.00	A	<1 vehicle	0.00	A	<1 vehicle
	WBL	0.01	A	<1 vehicle	0.06	A	<1 vehicle
	NBLTR	0.16	B	<1 vehicle	0.22	C	7
	SBLTR	0.14	C	<1 vehicle	0.42	D	16

**EBL to be added for safety and geometric considerations*

As presented in **Table 7-4**, the intersection of McLeod Road and Beechwood Road is currently operating well. The intersection movements operate with reserve capacity and delays at an LOS B or better All movements operate without queuing concerns.

With the addition of 2027 corridor growth and other development generated traffic, the intersection is forecast to operate well with and without site generated traffic. Most movements during the a.m. and p.m. peak hours are forecast to operate at an LOS C or better except for the southbound movement, which operates at an LOS D.

With the addition of 2032 corridor growth, the intersection is still forecast to operate well. All movements during the a.m. and p.m. peak hours are forecast to operate at an LOS C or better, with reserve capacity and with no queuing concerns. With the addition of site generated traffic, the intersection continues to operate well. The movements are forecast to operate with a considerable amount of capacity, and with minimal queuing. Most movements during the a.m. and p.m. peak hours are forecast to operate at an LOS C or better except for the southbound movement during the p.m. peak hour, which operates at an LOS D (less than 50s of delay).

Based on the results of the operation analysis, the site generated traffic does not result in any geometric improvements. Based on background traffic, a westbound left turn auxiliary lane is warranted. As mentioned previously under section 6.1 it is recommended that an eastbound left turn lane also be implemented.

7.5 McLeod Road at Street 'B'

Table 7-5: Unsignalized Capacity Analysis Results – Street 'B' at McLeod Road

SCENARIO	MOVE.	WEEKDAY A.M. PEAK HOUR			WEEKDAY P.M. PEAK HOUR		
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)
2027 Future Total	WBL	0.02	A	<1 vehicle	0.09	A	<1 vehicle
	WBT	0.19	-	<1 vehicle	0.26	-	<1 vehicle
	NBLR	0.19	B	<1 vehicle	0.18	C	<1 vehicle
	EBTR	0.16	-	<1 vehicle	0.26	-	<1 vehicle
2032 Future Total	WBL	0.02	A	<1 vehicle	0.09	A	<1 vehicle
	WBT	0.21	-	<1 vehicle	0.28	-	<1 vehicle
	NBLR	0.20	B	<1 vehicle	0.20	C	<1 vehicle
	EBTR	0.18	-	<1 vehicle	-	-	<1 vehicle

As presented in **Table 7-5**, the intersection of the McLeod Road and Street 'B' is forecast to operate with no issues up to and including the 2032 horizon year.

In both peak hours during the ultimate horizon year, the outbound movement from the roadway is forecast to operate at an LOS C or better, while the inbound movement is forecast to operate at an LOS A. Each intersection movement is forecast to have abundant reserve capacity with 95th percentile queue forecast to not exceed 1 vehicle. The eastbound movement is free flow and not expected to have any capacity constraints with the through-right shared lane. As such, a right turn lane is not required at this intersection.

The westbound movement at the intersection of Beechwood Road and McLeod Road is forecast to not exceed 1 vehicle. Queues from this intersection are not expected to surpass the Street 'B' Access.

7.6 Beechwood Road at Street 'A'

Table 7-6: Unsignalized Capacity Analysis Results – Street 'A' at Beechwood Road

SCENARIO	MOVE.	WEEKDAY A.M. PEAK HOUR			WEEKDAY P.M. PEAK HOUR		
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)
2027 Future Total	WBLR	0.08	A	<1 vehicle	0.06	A	<1 vehicle
	SBLT	0.02	A	<1 vehicle	0.05	A	<1 vehicle
	NBTR	0.01	-	<1 vehicle	0.02	-	<1 vehicle
2032 Future Total	WBLR	0.08	A	<1 vehicle	0.06	A	<1 vehicle
	SBLT	0.02	A	<1 vehicle	0.05	A	<1 vehicle
	NBTR	0.01	-	<1 vehicle	0.02	-	<1 vehicle

As presented in **Table 7-6**, the intersection of the Beechwood Road and Street 'A' is forecast to operate with no issues up to and including the 2032 horizon year.

In both peak hours during the ultimate horizon year, the both the inbound and outbound roadway movements are forecast to operate at an LOS A. Each intersection movement is forecast to have abundant reserve capacity with 95th percentile queue forecast to not exceed 1 vehicle.

8.0 SUMMARY OF FINDINGS

The findings of the traffic impact study are summarized as follows:

- The proposed residential development is projected to generate approximately 252 total two-way trips during the weekday a.m. peak hour (62 inbound and 190 outbound), and 335 total two-way trips during the weekday p.m. peak hour (211 inbound and 124 outbound)
- At the intersection of McLeod Road and Kalar Road, the site generated traffic is not expected to result in any critical capacity, delay or queuing concerns upon build-out the development and up to the study's ultimate 2032 horizon year. The queues for certain movements are forecast to extend beyond the existing storage lanes, but this occurs as a result of the corridor growth and background development traffic.
- At the intersection of McLeod Road and Garner Road, the site generated traffic is not expected to result in any critical capacity, delay or queuing concerns upon build-out the development and up to the study's ultimate 2032 horizon year.
- At the intersection of McLeod Road and Beechwood Road, the site generated traffic is not expected to result in any critical capacity or queuing concerns upon build-out the development and up to the study's ultimate 2032 horizon year. During the 2032 future horizon year, the delays are generally less than 25 seconds during both peak hours, except for the southbound movement in the p.m. peak hour, which has elevated delays.
- All proposed site access intersections are forecast to operate well into the 2032 horizon year with no delay, capacity, or queuing concerns.
- A westbound left turning auxiliary lane is warranted at the intersections Beechwood Road and McLeod Road as a result of the background traffic. It is recommended that an eastbound left turn lane also be implemented. A westbound left auxiliary lane is also warranted at the McLeod intersection with Street 'B'. The implementation of the left turning lanes should be considered during the City's planned EA to be completed in 2023.
- Overall, the existing roadway system has sufficient capacity to accommodate the anticipated traffic generation from the subject development.

Overall, it is concluded that the McLeod Meadows site generated traffic can be accommodated with the geometric modifications noted in the above summary of findings.

APPENDIX A

Existing Data

APPENDIX A.1

Turning Movement Count Data

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Niagara Falls
Site #: 2219400003
Intersection: McLeod Rd & Kalar Rd
TFR File #: 1
Count date: 4-Oct-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: McLeod Rd runs W/E

North Leg Total: 956
North Entering: 567
North Peds: 18
Peds Cross: ⋈

Heavys	4	3	5	12
Trucks	0	1	3	4
Cars	142	95	314	551
Totals	146	99	322	

Heavys	25
Trucks	6
Cars	358
Totals	389

East Leg Total: 1388
East Entering: 547
East Peds: 5
Peds Cross: ⧖

Kalar Rd

Heavys	Trucks	Cars	Totals
24	5	500	529

McLeod Rd

Cars	Trucks	Heavys	Totals
193	2	7	202
274	5	19	298
40	1	6	47
507	8	32	

N
W E
S

Heavys	Trucks	Cars	Totals
5	1	63	69
21	6	343	370
1	0	43	44
27	7	449	

McLeod Rd

Cars	Trucks	Heavys	Totals
795	12	34	841

Kalar Rd

Peds Cross: ⧖
West Peds: 13
West Entering: 483
West Leg Total: 1012

Cars	178
Trucks	2
Heavys	10
Totals	190

Cars	84	102	138	324
Trucks	0	3	3	6
Heavys	1	13	8	22
Totals	85	118	149	

Peds Cross: ⋈
South Peds: 0
South Entering: 352
South Leg Total: 542

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Niagara Falls
Site #: 2219400003
Intersection: McLeod Rd & Kalar Rd
TFR File #: 1
Count date: 4-Oct-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: McLeod Rd runs W/E

North Leg Total: 1190
North Entering: 513
North Peds: 6
Peds Cross: ⋈

Heavys	3	1	0	4
Trucks	1	1	1	3
Cars	63	143	300	506
Totals	67	145	301	

Heavys	4
Trucks	3
Cars	670
Totals	677

East Leg Total: 1882
East Entering: 1014
East Peds: 7
Peds Cross: ⧗

Kalar Rd

Heavys	Trucks	Cars	Totals
8	3	557	568

McLeod Rd

Cars	Trucks	Heavys	Totals
426	1	0	427
453	2	5	460
126	1	0	127
1005	4	5	

N
W E
S

Heavys	Trucks	Cars	Totals
1	1	84	86
8	4	396	408
2	0	34	36
11	5	514	

McLeod Rd

Cars	Trucks	Heavys	Totals
852	5	11	868

Kalar Rd

Peds Cross: ⧗
West Peds: 7
West Entering: 530
West Leg Total: 1098

Cars	303
Trucks	2
Heavys	3
Totals	308

Cars	41	160	156	357
Trucks	0	1	0	1
Heavys	0	3	3	6
Totals	41	164	159	

Peds Cross: ⋈
South Peds: 4
South Entering: 364
South Leg Total: 672

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

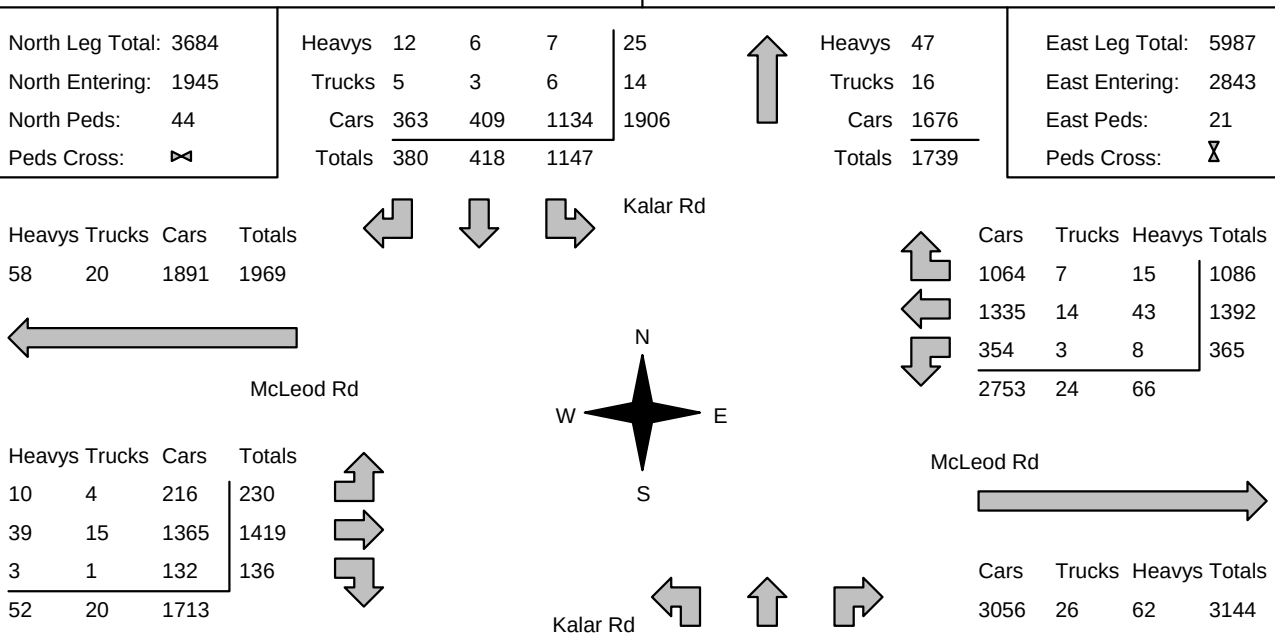
Municipality: Niagara Falls
Site #: 2219400003
Intersection: McLeod Rd & Kalar Rd
TFR File #: 1
Count date: 4-Oct-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: McLeod Rd runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: McLeod Rd & Kalar Rd | **Count Date:** 4-Oct-22 | **Municipality:** Niagara Falls

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*176*	*57*	*112*	*345*	*10*
9:00:00	*332*	*98*	*125*	*555*	*19*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*298*	*105*	*62*	*465*	*6*
18:00:00	*341*	*158*	*81*	*580*	*9*
Totals:	1147	418	380	1945	44

North/South Total Approaches: *3143*

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*74*	*38*	*111*	*223*	*0*
9:00:00	*42*	*123*	*166*	*331*	*2*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*38*	*147*	*148*	*333*	*2*
18:00:00	*43*	*115*	*153*	*311*	*3*
S Totals:	197	423	578	1198	7

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*57*	*286*	*98*	*441*	*4*
9:00:00	*52*	*246*	*209*	*507*	*5*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*119*	*475*	*394*	*988*	*8*
18:00:00	*137*	*385*	*385*	*907*	*4*
Totals:	365	1392	1086	2843	21

East/West Total Approaches: *4628*

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*29*	*256*	*34*	*319*	*5*
9:00:00	*60*	*375*	*29*	*464*	*12*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*89*	*380*	*36*	*505*	*4*
18:00:00	*52*	*408*	*37*	*497*	*11*
W Totals:	230	1419	136	1785	32

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*16:00*	*17:00*	*18:00*	*0:00*	*0:00*
Crossing Values:	*0*	*316*	*514*	*0*	*495*	*557*	*0*	*0*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400003**

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	32	32	9	9	12	12	0	0	0	0	1	1	1	1	0	0	0	0	0	0
7:30:00	61	29	15	6	33	21	0	0	1	1	1	0	1	0	0	0	0	0	0	0
7:45:00	104	43	34	19	63	30	0	0	1	0	3	2	1	0	0	0	1	1	6	6
8:00:00	173	69	54	20	106	43	1	1	1	0	3	0	2	1	2	2	3	2	10	4
8:15:00	246	73	70	16	138	32	1	0	1	0	3	0	2	0	2	0	3	0	15	5
8:30:00	329	83	95	25	164	26	2	1	1	0	3	0	5	3	3	1	4	1	20	5
8:45:00	418	89	129	34	205	41	3	1	2	1	3	0	6	1	3	0	5	1	24	4
9:00:00	497	79	148	19	227	22	4	1	2	0	4	1	7	1	5	2	6	1	29	5
9:15:00	497	0	148	0	227	0	4	0	2	0	4	0	7	0	5	0	6	0	29	0
16:00:00	497	0	148	0	227	0	4	0	2	0	4	0	7	0	5	0	6	0	29	0
16:15:00	575	78	169	21	242	15	5	1	2	0	4	0	7	0	5	0	8	2	31	2
16:30:00	652	77	186	17	260	18	5	0	2	0	4	0	7	0	5	0	8	0	34	3
16:45:00	714	62	223	37	272	12	6	1	2	0	5	1	7	0	5	0	10	2	34	0
17:00:00	793	79	252	29	284	12	6	0	3	1	5	0	7	0	5	0	10	0	35	1
17:15:00	865	72	289	37	303	19	6	0	3	0	5	0	7	0	5	0	11	1	39	4
17:30:00	952	87	329	40	323	20	6	0	3	0	5	0	7	0	6	1	11	0	40	1
17:45:00	1040	88	364	35	347	24	6	0	3	0	5	0	7	0	6	0	12	1	42	2
18:00:00	1134	94	409	45	363	16	6	0	3	0	5	0	7	0	6	0	12	0	44	2
18:15:00	1134	0	409	0	363	0	6	0	3	0	5	0	7	0	6	0	12	0	44	0
18:15:15	1134	0	409	0	363	0	6	0	3	0	5	0	7	0	6	0	12	0	44	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400003**

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	10	10	35	35	10	10	0	0	1	1	0	0	0	0	1	1	1	1	0	0
7:30:00	29	19	94	59	27	17	0	0	4	3	1	1	0	0	4	3	3	2	2	2
7:45:00	44	15	162	68	56	29	0	0	4	0	1	0	0	0	9	5	6	3	2	0
8:00:00	53	9	260	98	89	33	0	0	5	1	1	0	4	4	21	12	8	2	4	2
8:15:00	59	6	333	73	140	51	1	1	6	1	2	1	5	1	23	2	10	2	4	0
8:30:00	67	8	384	51	205	65	1	0	9	3	2	0	6	1	26	3	11	1	5	1
8:45:00	84	17	436	52	249	44	1	0	9	0	3	1	6	0	28	2	13	2	7	2
9:00:00	102	18	492	56	289	40	1	0	9	0	3	0	6	0	31	3	15	2	9	2
9:15:00	102	0	492	0	289	0	1	0	9	0	3	0	6	0	31	0	15	0	9	0
16:00:00	102	0	492	0	289	0	1	0	9	0	3	0	6	0	31	0	15	0	9	0
16:15:00	127	25	602	110	375	86	1	0	10	1	3	0	6	0	35	4	15	0	9	0
16:30:00	159	32	711	109	472	97	2	1	11	1	5	2	8	2	38	3	15	0	10	1
16:45:00	185	26	835	124	584	112	2	0	11	0	5	0	8	0	39	1	15	0	14	4
17:00:00	217	32	953	118	680	96	3	1	12	1	6	1	8	0	42	3	15	0	17	3
17:15:00	249	32	1058	105	798	118	3	0	13	1	6	0	8	0	43	1	15	0	17	0
17:30:00	285	36	1164	106	898	100	3	0	13	0	6	0	8	0	43	0	15	0	17	0
17:45:00	320	35	1258	94	982	84	3	0	14	1	6	0	8	0	43	0	15	0	21	4
18:00:00	354	34	1335	77	1064	82	3	0	14	0	7	1	8	0	43	0	15	0	21	0
18:15:00	354	0	1335	0	1064	0	3	0	14	0	7	0	8	0	43	0	15	0	21	0
18:15:15	354	0	1335	0	1064	0	3	0	14	0	7	0	8	0	43	0	15	0	21	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400003**

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	6	6	8	8	18	18	0	0	0	0	0	0	1	1	1	1	0	0	0	0
7:30:00	14	8	11	3	46	28	0	0	0	0	0	0	1	0	2	1	0	0	0	0
7:45:00	23	9	19	8	78	32	0	0	1	1	0	0	2	1	2	0	3	3	0	0
8:00:00	72	49	32	13	107	29	0	0	1	0	0	0	2	0	5	3	4	1	0	0
8:15:00	89	17	53	21	147	40	0	0	1	0	0	0	3	1	8	3	7	3	0	0
8:30:00	98	9	86	33	180	33	0	0	4	3	1	1	3	0	15	7	8	1	0	0
8:45:00	107	9	121	35	216	36	0	0	4	0	3	2	3	0	15	0	11	3	0	0
9:00:00	112	5	141	20	262	46	1	1	4	0	4	1	3	0	16	1	11	0	2	2
9:15:00	112	0	141	0	262	0	1	0	4	0	4	0	3	0	16	0	11	0	2	0
16:00:00	112	0	141	0	262	0	1	0	4	0	4	0	3	0	16	0	11	0	2	0
16:15:00	120	8	161	20	299	37	1	0	4	0	5	1	3	0	16	0	12	1	3	1
16:30:00	129	9	193	32	324	25	1	0	4	0	5	0	3	0	17	1	12	0	3	0
16:45:00	136	7	242	49	369	45	1	0	4	0	5	0	3	0	18	1	13	1	4	1
17:00:00	150	14	285	43	406	37	1	0	4	0	5	0	3	0	19	1	14	1	4	0
17:15:00	161	11	317	32	452	46	1	0	4	0	5	0	3	0	19	0	15	1	7	3
17:30:00	170	9	353	36	480	28	1	0	5	1	5	0	3	0	20	1	15	0	7	0
17:45:00	187	17	373	20	510	30	1	0	5	0	5	0	3	0	21	1	16	1	7	0
18:00:00	193	6	396	23	557	47	1	0	5	0	5	0	3	0	22	1	16	0	7	0
18:15:00	193	0	396	0	557	0	1	0	5	0	5	0	3	0	22	0	16	0	7	0
18:15:15	193	0	396	0	557	0	1	0	5	0	5	0	3	0	22	0	16	0	7	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400003**

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	36	36	7	7	0	0	0	0	1	1	0	0	0	0	0	0	0	0
7:30:00	4	3	99	63	9	2	0	0	0	0	1	0	0	0	1	1	0	0	0	0
7:45:00	9	5	165	66	15	6	1	1	1	1	1	0	2	2	3	2	0	0	0	0
8:00:00	26	17	243	78	32	17	1	0	3	2	1	0	2	0	10	7	1	1	5	5
8:15:00	39	13	334	91	41	9	1	0	6	3	1	0	6	4	16	6	1	0	9	4
8:30:00	54	15	426	92	48	7	1	0	6	0	1	0	7	1	21	5	1	0	11	2
8:45:00	72	18	508	82	58	10	2	1	7	1	1	0	7	0	24	3	1	0	13	2
9:00:00	80	8	597	89	61	3	2	0	9	2	1	0	7	0	25	1	1	0	17	4
9:15:00	80	0	597	0	61	0	2	0	9	0	1	0	7	0	25	0	1	0	17	0
16:00:00	80	0	597	0	61	0	2	0	9	0	1	0	7	0	25	0	1	0	17	0
16:15:00	95	15	675	78	76	15	3	1	10	1	1	0	9	2	27	2	1	0	18	1
16:30:00	113	18	770	95	81	5	3	0	11	1	1	0	9	0	30	3	1	0	18	0
16:45:00	134	21	867	97	91	10	3	0	13	2	1	0	9	0	31	1	2	1	18	0
17:00:00	165	31	964	97	96	5	3	0	14	1	1	0	10	1	33	2	2	0	21	3
17:15:00	180	15	1058	94	105	9	4	1	14	0	1	0	10	0	37	4	2	0	24	3
17:30:00	197	17	1166	108	115	10	4	0	15	1	1	0	10	0	38	1	3	1	25	1
17:45:00	207	10	1274	108	125	10	4	0	15	0	1	0	10	0	39	1	3	0	28	3
18:00:00	216	9	1365	91	132	7	4	0	15	0	1	0	10	0	39	0	3	0	32	4
18:15:00	216	0	1365	0	132	0	4	0	15	0	1	0	10	0	39	0	3	0	32	0
18:15:15	216	0	1365	0	132	0	4	0	15	0	1	0	10	0	39	0	3	0	32	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

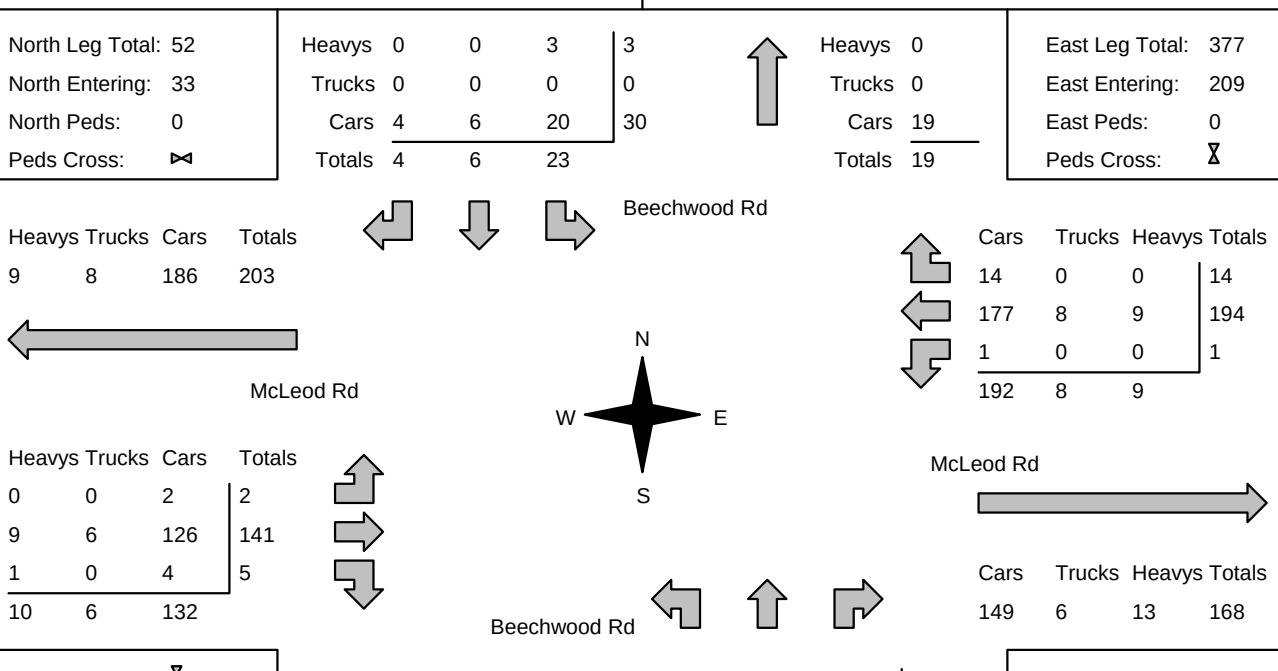
Municipality: Niagara Falls
Site #: 2219400001
Intersection: McLeod Rd & Beechwood Rd
TFR File #: 1
Count date: 4-Oct-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: McLeod Rd runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Niagara Falls
Site #: 2219400001
Intersection: McLeod Rd & Beechwood Rd
TFR File #: 1
Count date: 4-Oct-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: McLeod Rd runs W/E

North Leg Total: 57
North Entering: 32
North Peds: 0
Peds Cross: ⋈

Heavys	0	1	0	1
Trucks	0	0	0	0
Cars	1	8	22	31
Totals	1	9	22	

Heavys	0
Trucks	0
Cars	25
Totals	25

East Leg Total: 575
East Entering: 281
East Peds: 0
Peds Cross: ⧗

Beechwood Rd

Heavys	Trucks	Cars	Totals
4	3	266	273

McLeod Rd

Heavys	Trucks	Cars	Totals
0	0	2	2
6	4	261	271
1	1	7	9
7	5	270	

N
W E
S

Cars	Trucks	Heavys	Totals
16	0	0	16
257	3	3	263
2	0	0	2
275	3	3	

McLeod Rd

Cars	Trucks	Heavys	Totals
284	4	6	294

Beechwood Rd

Peds Cross: ⧗
West Peds: 0
West Entering: 282
West Leg Total: 555

Cars	17
Trucks	1
Heavys	2
Totals	20

Cars	8	7	1	16
Trucks	0	0	0	0
Heavys	1	0	0	1
Totals	9	7	1	

Peds Cross: ⋈
South Peds: 0
South Entering: 17
South Leg Total: 37

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

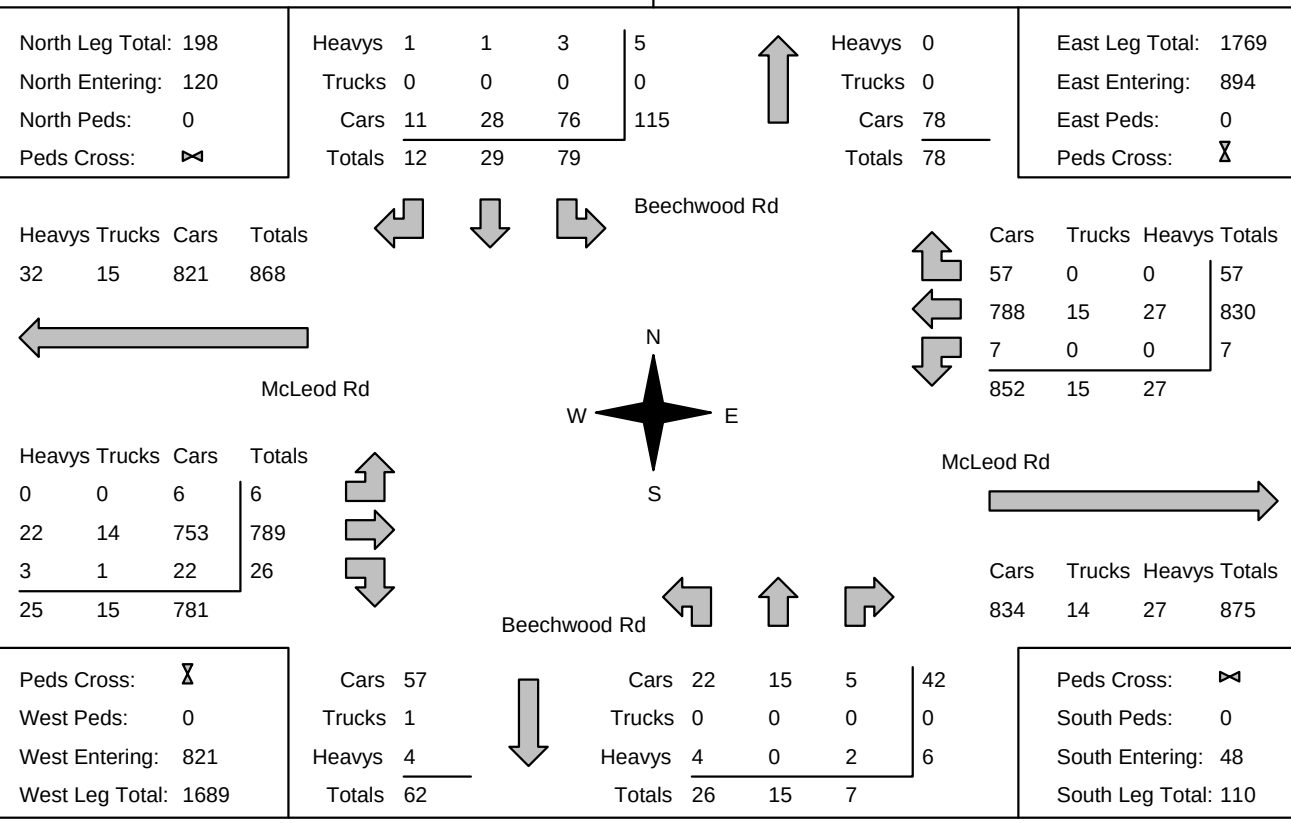
Municipality: Niagara Falls
Site #: 2219400001
Intersection: McLeod Rd & Beechwood Rd
TFR File #: 1
Count date: 4-Oct-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: McLeod Rd runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: McLeod Rd & Beechwood Rd | **Count Date:** 4-Oct-22 | **Municipality:** Niagara Falls

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	North/South Total Approaches
	Left	Thru	Right	Grand Total		
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*
8:00:00	*12*	*8*	*6*	*26*	*0*	*33*
9:00:00	*23*	*6*	*4*	*33*	*0*	*45*
16:00:00	*0*	*0*	*0*	*0*	*0*	*0*
17:00:00	*21*	*6*	*0*	*27*	*0*	*40*
18:00:00	*23*	*9*	*2*	*34*	*0*	*50*
Totals:	79	29	12	120	0	168

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*4*	*3*	*0*	*7*	*0*
9:00:00	*5*	*3*	*4*	*12*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*7*	*3*	*3*	*13*	*0*
18:00:00	*10*	*6*	*0*	*16*	*0*
S Totals:	26	15	7	48	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	East/West Total Approaches
	Left	Thru	Right	Grand Total		
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*
8:00:00	*1*	*143*	*8*	*152*	*0*	*302*
9:00:00	*1*	*194*	*14*	*209*	*0*	*357*
16:00:00	*0*	*0*	*0*	*0*	*0*	*0*
17:00:00	*2*	*267*	*14*	*283*	*0*	*543*
18:00:00	*3*	*226*	*21*	*250*	*0*	*513*
Totals:	7	830	57	894	0	1715

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*140*	*10*	*150*	*0*
9:00:00	*2*	*141*	*5*	*148*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*1*	*249*	*10*	*260*	*0*
18:00:00	*3*	*259*	*1*	*263*	*0*
W Totals:	6	789	26	821	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*16:00*	*17:00*	*18:00*	*0:00*	*0:00*
Crossing Values:	*0*	*24*	*34*	*0*	*34*	*42*	*0*	*0*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400001**

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	4	2	4	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	9	5	5	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	12	3	8	3	5	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0
8:15:00	17	5	9	1	5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
8:30:00	22	5	10	1	5	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0
8:45:00	27	5	12	2	7	2	0	0	0	0	0	0	1	0	0	0	1	0	0	0
9:00:00	32	5	14	2	9	2	0	0	0	0	0	0	3	2	0	0	1	0	0	0
9:15:00	32	0	14	0	9	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0
16:00:00	32	0	14	0	9	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0
16:15:00	35	3	14	0	9	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0
16:30:00	41	6	15	1	9	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0
16:45:00	47	6	17	2	9	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0
17:00:00	53	6	19	2	9	0	0	0	0	0	0	0	3	0	1	1	1	0	0	0
17:15:00	58	5	21	2	9	0	0	0	0	0	0	0	3	0	1	0	1	0	0	0
17:30:00	63	5	23	2	10	1	0	0	0	0	0	0	3	0	1	0	1	0	0	0
17:45:00	70	7	24	1	10	0	0	0	0	0	0	0	3	0	1	0	1	0	0	0
18:00:00	76	6	28	4	11	1	0	0	0	0	0	0	3	0	1	0	1	0	0	0
18:15:00	76	0	28	0	11	0	0	0	0	0	0	0	3	0	1	0	1	0	0	0
18:15:15	76	0	28	0	11	0	0	0	0	0	0	0	3	0	1	0	1	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400001**

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	25	25	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
7:30:00	1	1	51	26	2	1	0	0	2	2	0	0	0	0	2	1	0	0	0	0
7:45:00	1	0	86	35	5	3	0	0	3	1	0	0	0	0	3	1	0	0	0	0
8:00:00	1	0	134	48	8	3	0	0	3	0	0	0	0	0	6	3	0	0	0	0
8:15:00	1	0	177	43	14	6	0	0	5	2	0	0	0	0	8	2	0	0	0	0
8:30:00	2	1	220	43	17	3	0	0	6	1	0	0	0	0	11	3	0	0	0	0
8:45:00	2	0	265	45	19	2	0	0	8	2	0	0	0	0	13	2	0	0	0	0
9:00:00	2	0	311	46	22	3	0	0	11	3	0	0	0	0	15	2	0	0	0	0
9:15:00	2	0	311	0	22	0	0	0	11	0	0	0	0	0	15	0	0	0	0	0
16:00:00	2	0	311	0	22	0	0	0	11	0	0	0	0	0	15	0	0	0	0	0
16:15:00	3	1	377	66	22	0	0	0	11	0	0	0	0	0	20	5	0	0	0	0
16:30:00	4	1	427	50	26	4	0	0	11	0	0	0	0	0	23	3	0	0	0	0
16:45:00	4	0	489	62	30	4	0	0	11	0	0	0	0	0	23	0	0	0	0	0
17:00:00	4	0	567	78	36	6	0	0	13	2	0	0	0	0	24	1	0	0	0	0
17:15:00	4	0	632	65	39	3	0	0	14	1	0	0	0	0	26	2	0	0	0	0
17:30:00	6	2	684	52	42	3	0	0	14	0	0	0	0	0	26	0	0	0	0	0
17:45:00	6	0	737	53	49	7	0	0	15	1	0	0	0	0	27	1	0	0	0	0
18:00:00	7	1	788	51	57	8	0	0	15	0	0	0	0	0	27	0	0	0	0	0
18:15:00	7	0	788	0	57	0	0	0	15	0	0	0	0	0	27	0	0	0	0	0
18:15:15	7	0	788	0	57	0	0	0	15	0	0	0	0	0	27	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400001**

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
7:30:00	1	0	2	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
7:45:00	1	0	2	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0
8:00:00	2	1	3	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
8:15:00	6	4	5	2	1	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0
8:30:00	7	1	5	0	2	1	0	0	0	0	0	0	2	0	0	0	1	1	0	0
8:45:00	7	0	6	1	3	1	0	0	0	0	0	0	2	0	0	0	1	0	0	0
9:00:00	7	0	6	0	3	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0
9:15:00	7	0	6	0	3	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0
16:00:00	7	0	6	0	3	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0
16:15:00	8	1	6	0	3	0	0	0	0	0	0	0	3	1	0	0	2	1	0	0
16:30:00	11	3	7	1	4	1	0	0	0	0	0	0	3	0	0	0	2	0	0	0
16:45:00	11	0	7	0	4	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0
17:00:00	13	2	9	2	5	1	0	0	0	0	0	0	3	0	0	0	2	0	0	0
17:15:00	19	6	13	4	5	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0
17:30:00	19	0	14	1	5	0	0	0	0	0	0	0	4	1	0	0	2	0	0	0
17:45:00	20	1	15	1	5	0	0	0	0	0	0	0	4	0	0	0	2	0	0	0
18:00:00	22	2	15	0	5	0	0	0	0	0	0	0	4	0	0	0	2	0	0	0
18:15:00	22	0	15	0	5	0	0	0	0	0	0	0	4	0	0	0	2	0	0	0
18:15:15	22	0	15	0	5	0	0	0	0	0	0	0	4	0	0	0	2	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400001**

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	30	30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	64	34	2	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0
7:45:00	0	0	106	42	4	2	0	0	1	1	0	0	0	0	2	2	1	0	0	0
8:00:00	0	0	134	28	9	5	0	0	1	0	0	0	0	0	5	3	1	0	0	0
8:15:00	0	0	165	31	9	0	0	0	4	3	0	0	0	0	8	3	1	0	0	0
8:30:00	0	0	199	34	10	1	0	0	5	1	0	0	0	0	9	1	1	0	0	0
8:45:00	2	2	224	25	13	3	0	0	6	1	0	0	0	0	13	4	2	1	0	0
9:00:00	2	0	260	36	13	0	0	0	7	1	0	0	0	0	14	1	2	0	0	0
9:15:00	2	0	260	0	13	0	0	0	7	0	0	0	0	0	14	0	2	0	0	0
16:00:00	2	0	260	0	13	0	0	0	7	0	0	0	0	0	14	0	2	0	0	0
16:15:00	2	0	316	56	14	1	0	0	9	2	0	0	0	0	14	0	2	0	0	0
16:30:00	3	1	363	47	15	1	0	0	10	1	0	0	0	0	16	2	2	0	0	0
16:45:00	3	0	435	72	19	4	0	0	12	2	0	0	0	0	17	1	3	1	0	0
17:00:00	3	0	498	63	21	2	0	0	13	1	1	1	0	0	19	2	3	0	0	0
17:15:00	3	0	544	46	21	0	0	0	13	0	1	0	0	0	20	1	3	0	0	0
17:30:00	5	2	624	80	22	1	0	0	14	1	1	0	0	0	22	2	3	0	0	0
17:45:00	6	1	689	65	22	0	0	0	14	0	1	0	0	0	22	0	3	0	0	0
18:00:00	6	0	753	64	22	0	0	0	14	0	1	0	0	0	22	0	3	0	0	0
18:15:00	6	0	753	0	22	0	0	0	14	0	1	0	0	0	22	0	3	0	0	0
18:15:15	6	0	753	0	22	0	0	0	14	0	1	0	0	0	22	0	3	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

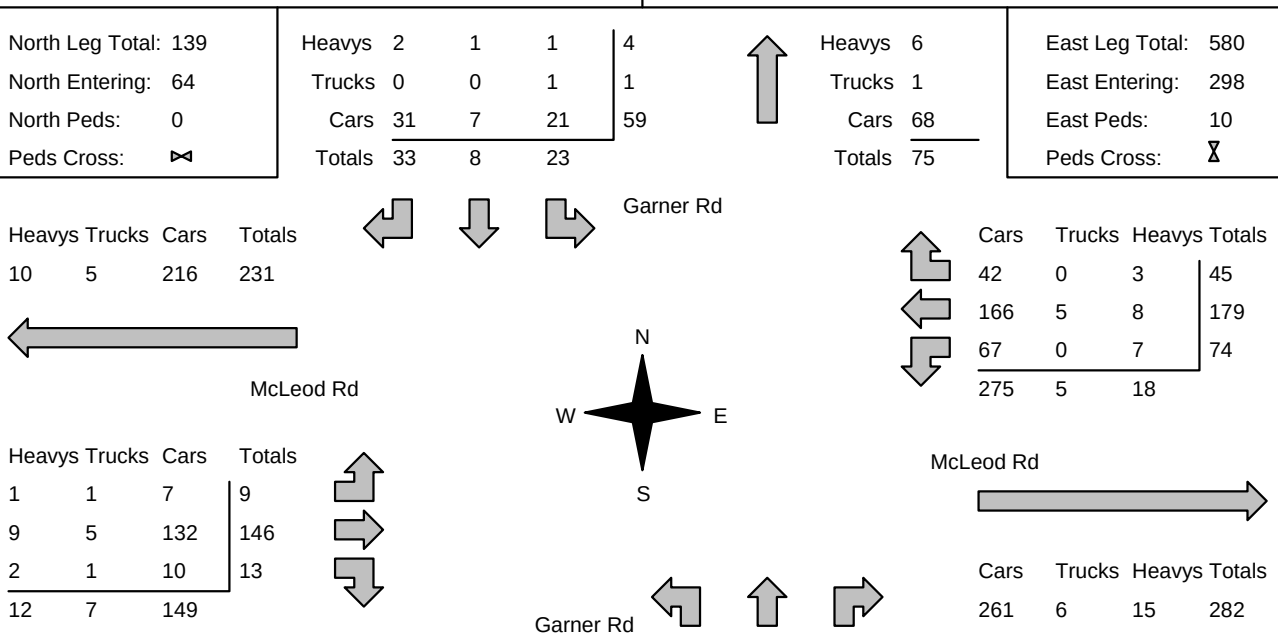
Municipality: Niagara Falls
Site #: 2219400002
Intersection: McLeod Rd & Garner Rd
TFR File #: 1
Count date: 4-Oct-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: McLeod Rd runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:00:00
To: 17:00:00

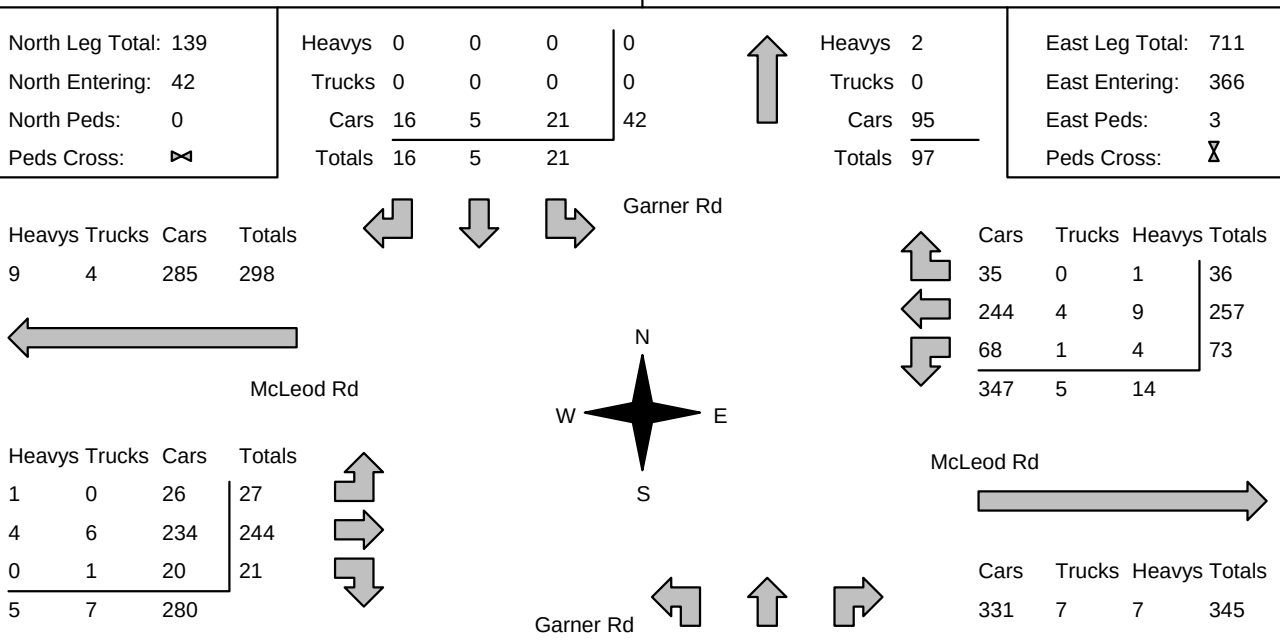
Municipality: Niagara Falls
Site #: 2219400002
Intersection: McLeod Rd & Garner Rd
TFR File #: 1
Count date: 4-Oct-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: McLeod Rd runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

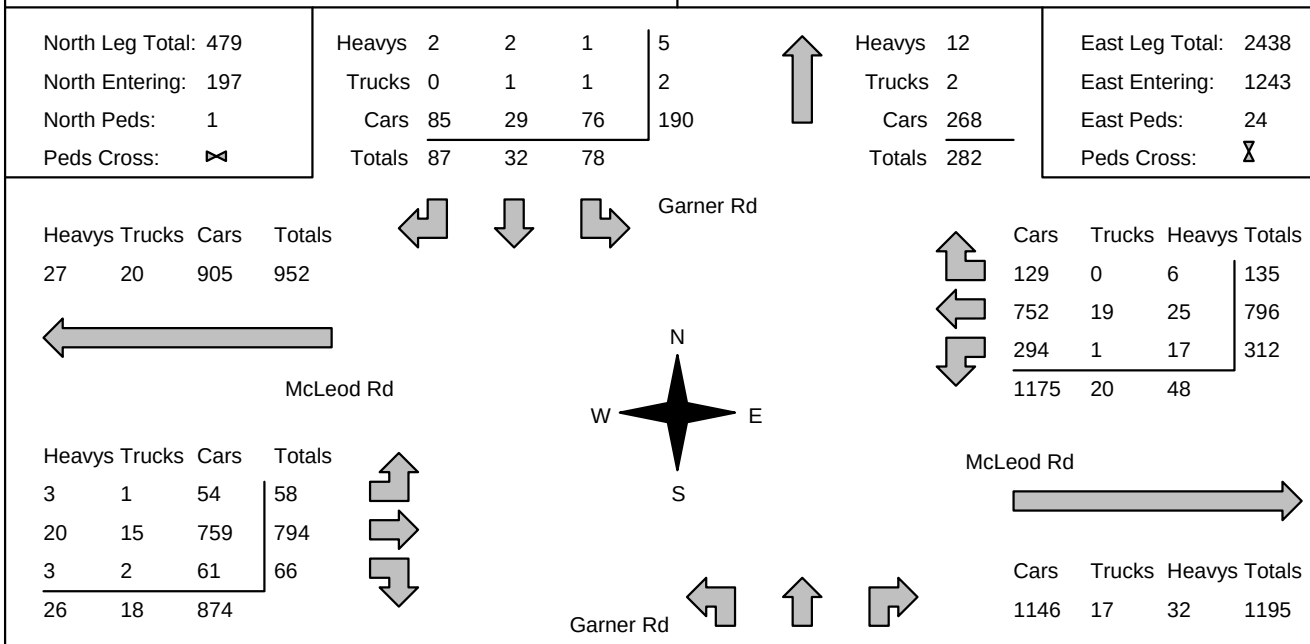
Municipality: Niagara Falls
Site #: 2219400002
Intersection: McLeod Rd & Garner Rd
TFR File #: 1
Count date: 4-Oct-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: McLeod Rd runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: McLeod Rd & Garner Rd | **Count Date:** 4-Oct-22 | **Municipality:** Niagara Falls

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*16*	*11*	*23*	*50*	*0*
9:00:00	*26*	*9*	*30*	*65*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*21*	*5*	*16*	*42*	*0*
18:00:00	*15*	*7*	*18*	*40*	*1*
Totals:	78	32	87	197	1

North/South Total Approaches: 678

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*10*	*8*	*59*	*77*	*0*
9:00:00	*21*	*23*	*108*	*152*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*25*	*34*	*80*	*139*	*0*
18:00:00	*13*	*24*	*76*	*113*	*0*
S Totals:	69	89	323	481	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*70*	*141*	*22*	*233*	*6*
9:00:00	*71*	*176*	*38*	*285*	*10*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*73*	*257*	*36*	*366*	*3*
18:00:00	*98*	*222*	*39*	*359*	*5*
Totals:	312	796	135	1243	24

East/West Total Approaches: 2161

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*4*	*140*	*11*	*155*	*0*
9:00:00	*16*	*147*	*14*	*177*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*27*	*244*	*21*	*292*	*0*
18:00:00	*11*	*263*	*20*	*294*	*0*
W Totals:	58	794	66	918	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*16:00*	*17:00*	*18:00*	*0:00*	*0:00*
Crossing Values:	*0*	*43*	*80*	*0*	*83*	*57*	*0*	*0*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400002**

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	2	2	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	6	4	4	2	7	3	0	0	1	1	0	0	0	0	1	1	0	0	0	0
7:45:00	11	5	5	1	14	7	0	0	1	0	0	0	0	0	1	0	0	0	0	0
8:00:00	16	5	8	3	22	8	0	0	1	0	0	0	0	0	2	1	1	1	0	0
8:15:00	21	5	9	1	29	7	1	1	1	0	0	0	0	0	2	0	1	0	0	0
8:30:00	28	7	10	1	41	12	1	0	1	0	0	0	1	1	2	0	1	0	0	0
8:45:00	32	4	12	2	45	4	1	0	1	0	0	0	1	0	2	0	2	1	0	0
9:00:00	40	8	17	5	51	6	1	0	1	0	0	0	1	0	2	0	2	0	0	0
9:15:00	40	0	17	0	51	0	1	0	1	0	0	0	1	0	2	0	2	0	0	0
16:00:00	40	0	17	0	51	0	1	0	1	0	0	0	1	0	2	0	2	0	0	0
16:15:00	46	6	20	3	53	2	1	0	1	0	0	0	1	0	2	0	2	0	0	0
16:30:00	53	7	20	0	58	5	1	0	1	0	0	0	1	0	2	0	2	0	0	0
16:45:00	56	3	21	1	60	2	1	0	1	0	0	0	1	0	2	0	2	0	0	0
17:00:00	61	5	22	1	67	7	1	0	1	0	0	0	1	0	2	0	2	0	0	0
17:15:00	64	3	23	1	73	6	1	0	1	0	0	0	1	0	2	0	2	0	0	0
17:30:00	66	2	25	2	75	2	1	0	1	0	0	0	1	0	2	0	2	0	0	0
17:45:00	73	7	26	1	80	5	1	0	1	0	0	0	1	0	2	0	2	0	1	1
18:00:00	76	3	29	3	85	5	1	0	1	0	0	0	1	0	2	0	2	0	1	0
18:15:00	76	0	29	0	85	0	1	0	1	0	0	0	1	0	2	0	2	0	1	0
18:15:15	76	0	29	0	85	0	1	0	1	0	0	0	1	0	2	0	2	0	1	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400002**

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	12	12	23	23	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0
7:30:00	33	21	54	31	4	4	0	0	4	3	0	0	0	0	3	2	0	0	0	0
7:45:00	45	12	86	32	11	7	0	0	6	2	0	0	1	1	5	2	1	1	3	3
8:00:00	64	19	128	42	21	10	0	0	6	0	0	0	6	5	7	2	1	0	6	3
8:15:00	83	19	174	46	38	17	0	0	8	2	0	0	7	1	9	2	2	1	9	3
8:30:00	91	8	209	35	45	7	0	0	10	2	0	0	7	0	12	3	3	1	12	3
8:45:00	112	21	252	43	53	8	0	0	11	1	0	0	8	1	13	1	4	1	13	1
9:00:00	131	19	289	37	55	2	0	0	13	2	0	0	10	2	15	2	5	1	16	3
9:15:00	131	0	289	0	55	0	0	0	13	0	0	0	10	0	15	0	5	0	16	0
16:00:00	131	0	289	0	55	0	0	0	13	0	0	0	10	0	15	0	5	0	16	0
16:15:00	149	18	351	62	64	9	0	0	14	1	0	0	11	1	20	5	6	1	18	2
16:30:00	170	21	402	51	76	12	0	0	15	1	0	0	11	0	23	3	6	0	18	0
16:45:00	187	17	465	63	81	5	1	1	15	0	0	0	13	2	23	0	6	0	18	0
17:00:00	199	12	533	68	90	9	1	0	17	2	0	0	14	1	24	1	6	0	19	1
17:15:00	222	23	589	56	101	11	1	0	18	1	0	0	16	2	25	1	6	0	21	2
17:30:00	243	21	651	62	108	7	1	0	18	0	0	0	16	0	25	0	6	0	22	1
17:45:00	275	32	703	52	115	7	1	0	19	1	0	0	17	1	25	0	6	0	22	0
18:00:00	294	19	752	49	129	14	1	0	19	0	0	0	17	0	25	0	6	0	24	2
18:15:00	294	0	752	0	129	0	1	0	19	0	0	0	17	0	25	0	6	0	24	0
18:15:15	294	0	752	0	129	0	1	0	19	0	0	0	17	0	25	0	6	0	24	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400002**

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	3	3	0	0	0	0	0	0	0	0	1	1	0	0	0	0
7:30:00	1	1	0	0	19	16	0	0	0	0	0	0	0	0	1	0	1	1	0	0
7:45:00	5	4	1	1	36	17	0	0	1	1	0	0	0	0	1	0	1	0	0	0
8:00:00	10	5	6	5	57	21	0	0	1	0	0	0	0	0	1	0	2	1	0	0
8:15:00	14	4	10	4	88	31	0	0	1	0	0	0	0	0	2	1	4	2	0	0
8:30:00	18	4	16	6	115	27	0	0	1	0	0	0	0	0	3	1	6	2	0	0
8:45:00	24	6	20	4	144	29	0	0	1	0	0	0	0	0	3	0	6	0	0	0
9:00:00	30	6	27	7	161	17	1	1	1	0	0	0	0	0	3	0	6	0	0	0
9:15:00	30	0	27	0	161	0	1	0	1	0	0	0	0	0	3	0	6	0	0	0
16:00:00	30	0	27	0	161	0	1	0	1	0	0	0	0	0	3	0	6	0	0	0
16:15:00	38	8	35	8	176	15	1	0	1	0	0	0	0	0	3	0	6	0	0	0
16:30:00	41	3	44	9	200	24	1	0	1	0	0	0	0	0	3	0	7	1	0	0
16:45:00	46	5	52	8	220	20	1	0	1	0	0	0	0	0	3	0	9	2	0	0
17:00:00	55	9	61	9	237	17	1	0	1	0	1	1	0	0	3	0	9	0	0	0
17:15:00	59	4	65	4	259	22	1	0	1	0	1	0	0	0	3	0	10	1	0	0
17:30:00	61	2	69	4	277	18	1	0	1	0	1	0	0	0	3	0	11	1	0	0
17:45:00	65	4	77	8	295	18	1	0	1	0	1	0	0	0	3	0	11	0	0	0
18:00:00	68	3	85	8	311	16	1	0	1	0	1	0	0	0	3	0	11	0	0	0
18:15:00	68	0	85	0	311	0	1	0	1	0	1	0	0	0	3	0	11	0	0	0
18:15:15	68	0	85	0	311	0	1	0	1	0	1	0	0	0	3	0	11	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 4-Oct-22 **Site #: 2219400002**

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	24	24	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	1	0	56	32	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	3	2	96	40	8	3	0	0	2	2	0	0	0	0	2	2	0	0	0	0
8:00:00	4	1	132	36	11	3	0	0	3	1	0	0	0	0	5	3	0	0	0	0
8:15:00	7	3	160	28	15	4	1	1	5	2	1	1	0	0	7	2	1	1	0	0
8:30:00	8	1	199	39	17	2	1	0	6	1	1	0	1	1	8	1	2	1	0	0
8:45:00	10	2	228	29	18	1	1	0	7	1	1	0	1	0	11	3	2	0	0	0
9:00:00	17	7	267	39	21	3	1	0	8	1	1	0	2	1	12	1	3	1	0	0
9:15:00	17	0	267	0	21	0	1	0	8	0	1	0	2	0	12	0	3	0	0	0
16:00:00	17	0	267	0	21	0	1	0	8	0	1	0	2	0	12	0	3	0	0	0
16:15:00	24	7	323	56	25	4	1	0	10	2	1	0	2	0	13	1	3	0	0	0
16:30:00	30	6	368	45	30	5	1	0	11	1	1	0	3	1	14	1	3	0	0	0
16:45:00	36	6	442	74	33	3	1	0	13	2	2	1	3	0	14	0	3	0	0	0
17:00:00	43	7	501	59	41	8	1	0	14	1	2	0	3	0	16	2	3	0	0	0
17:15:00	44	1	549	48	47	6	1	0	14	0	2	0	3	0	18	2	3	0	0	0
17:30:00	48	4	625	76	50	3	1	0	15	1	2	0	3	0	19	1	3	0	0	0
17:45:00	50	2	695	70	54	4	1	0	15	0	2	0	3	0	20	1	3	0	0	0
18:00:00	54	4	759	64	61	7	1	0	15	0	2	0	3	0	20	0	3	0	0	0
18:15:00	54	0	759	0	61	0	1	0	15	0	2	0	3	0	20	0	3	0	0	0
18:15:15	54	0	759	0	61	0	1	0	15	0	2	0	3	0	20	0	3	0	0	0

APPENDIX A.2

Signal Timing Plans

Signal Code: KLRMCL

Intersection: MCLEOD RD. & KALAR RD.

Municipality: niagarafalls

Owner: city

Last Modified: 2011-10-19 11:42:12 AM

Timing Parameters	EBD ADV. MCLEOD RD.	EBD/WBD THRU MCLEOD RD.	SBD ADV. KALAR RD.	NBD/SBD THRU KALAR RD.	n/a	n/a
Min Green	6	10	6	8	0	0
Walk	0	14	0	14	0	0
Ped Clearance	0	25	0	24	0	0
Vehicle Ext.	2.5	2.5	2.5	2.5	0	0
Max Green	11	30.7	12	34.7	0	0
Yellow	3	3.3	3	3.3	0	0
All Red	0	3.1	0	3	0	0

		Offset
Minimum Cycle	30.7	0
Pedestrian Cycle	89.7	
Maximum Cycle	107.1	0
Operation	FA	

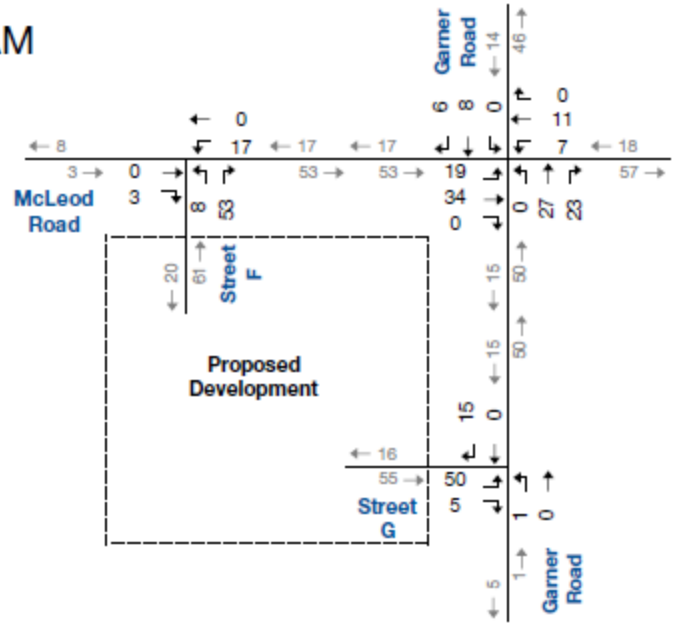
Installed On:	2008-11-18
Count Date:	--/--/----

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

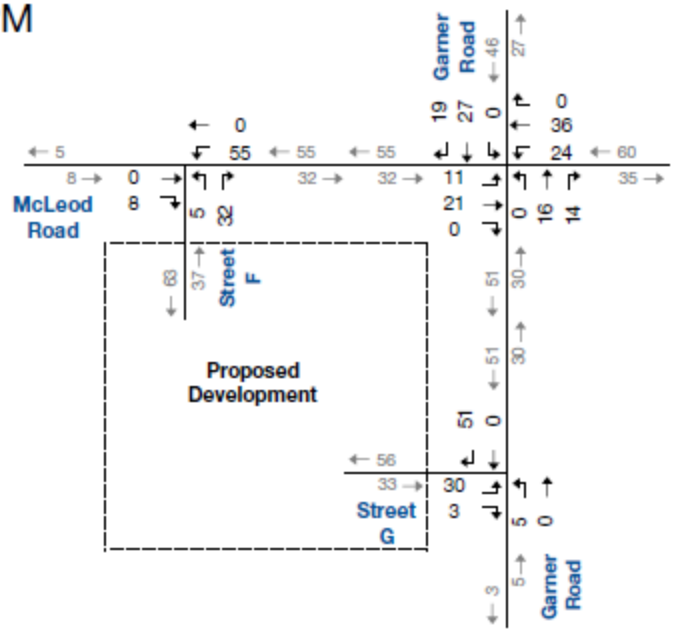
APPENDIX B

Background Developments

AM

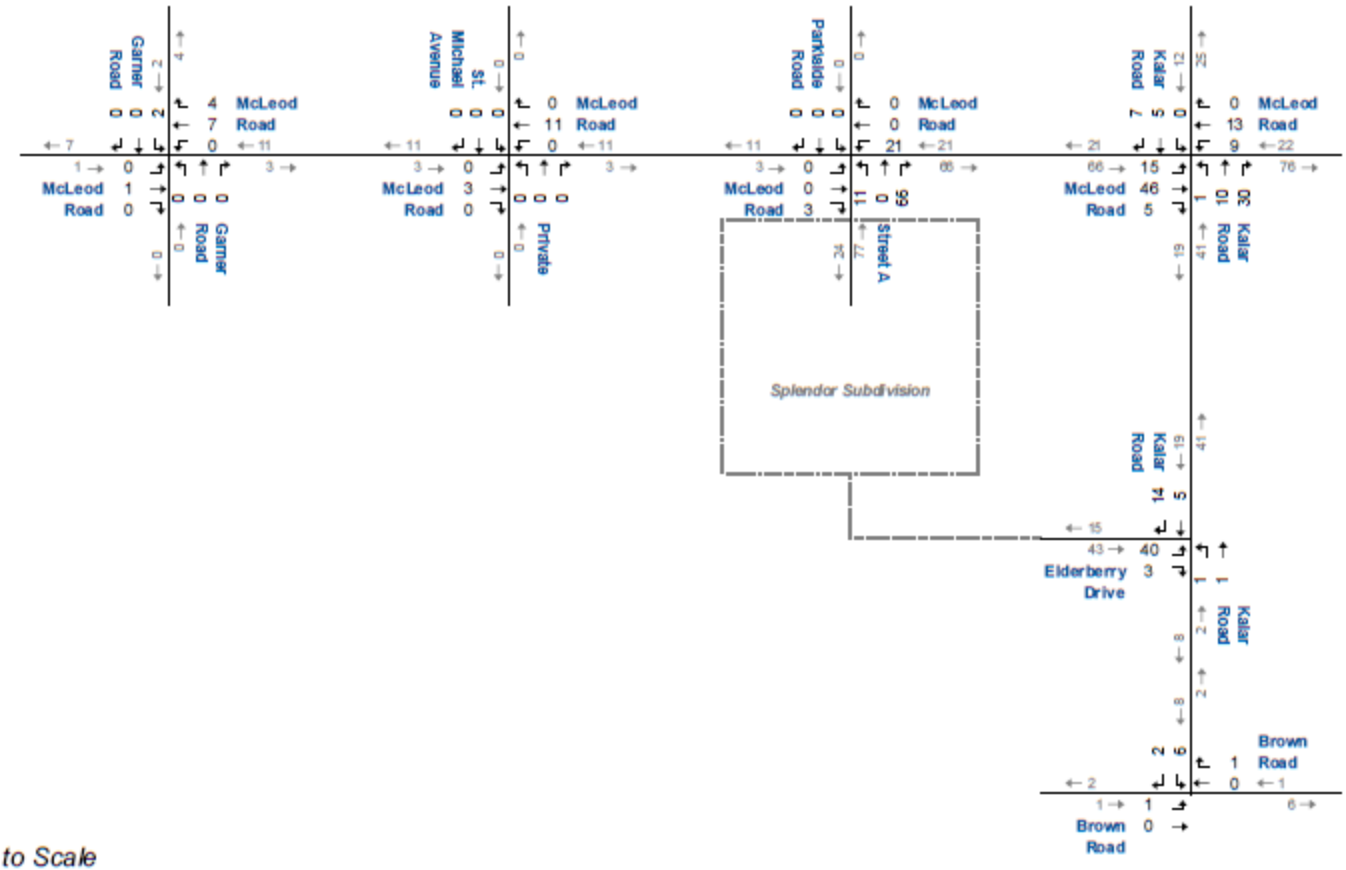


PM



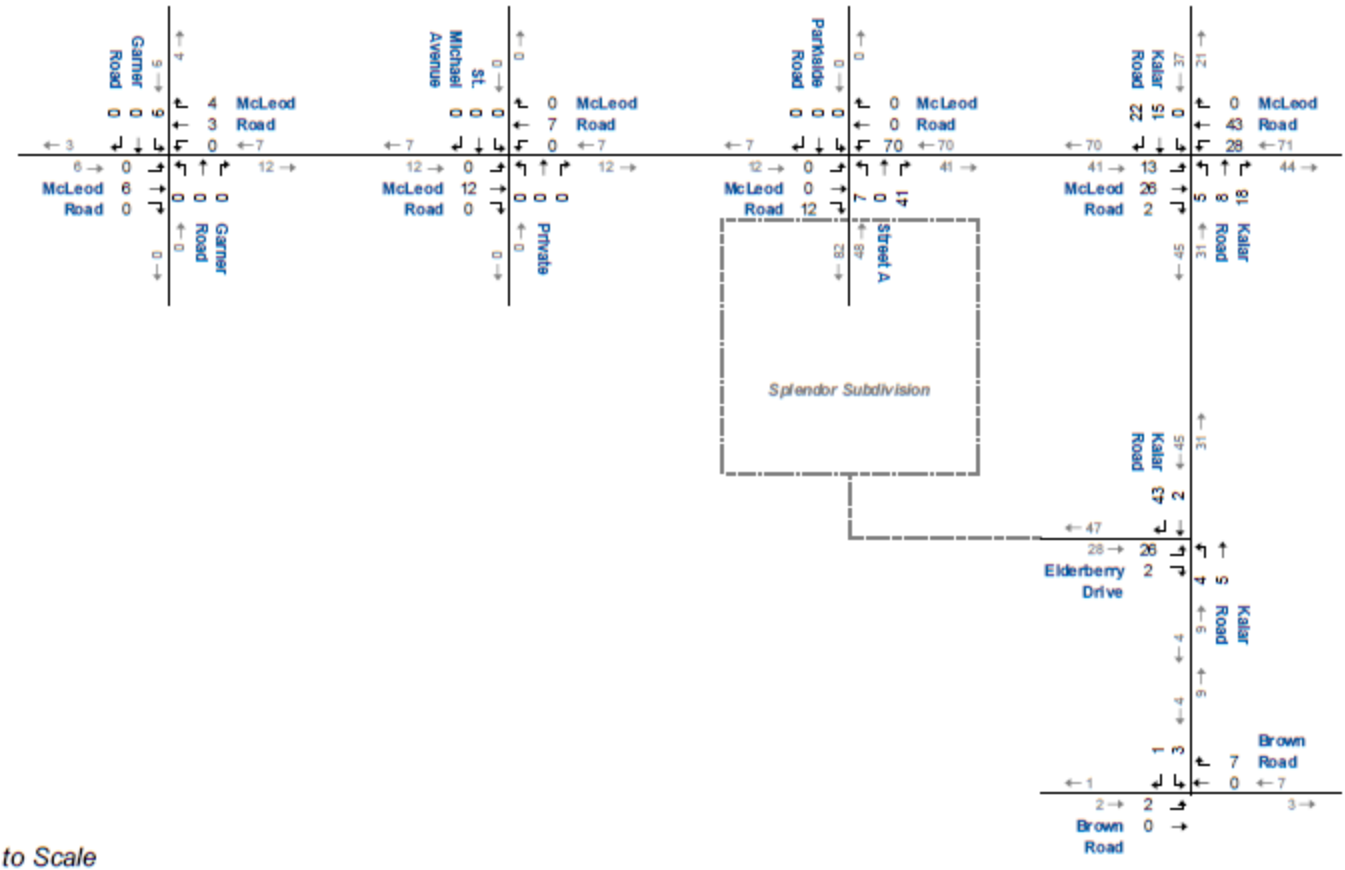
paradigm TRANSPORTATION SOLUTIONS LIMITED

Site Generated Peak Hour Traffic Forecasts



Not to Scale

Forecast Site Generated Traffic
AM Peak Hour



Not to Scale

Forecast Site Generated Traffic
PM Peak Hour

APPENDIX C

Transportation Tomorrow Survey

Thu Sep 29 2022 13:28:46 GMT-0400 (Eastern Daylight Time) - Run Time: 1828ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of household - gta06_hhld
Column: 2006 GTA zone of employment - gta06_emp

RowG:(6244)
ColG:
TblG:

Filters:
No Filters

Trip 2016
Table:

	Not Emplo	5206	6110	6210	6212	6216	6232	6236	6243	6244	Total
1	136	39	39	40	295	269	179	114	206	101	1282
		3%	3%	3%	23%	21%	14%	9%	16%	8%	
	A	B/A	A/C	A	A/C	C/A	A	A	A/D		

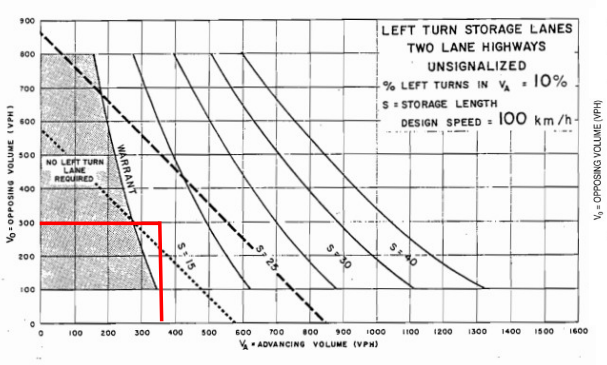
East Leg	A	69%	70%	
West leg	B	3%	5%	
N (Beechw	C	24%	20%	
S (Beechw	D	4%	5%	

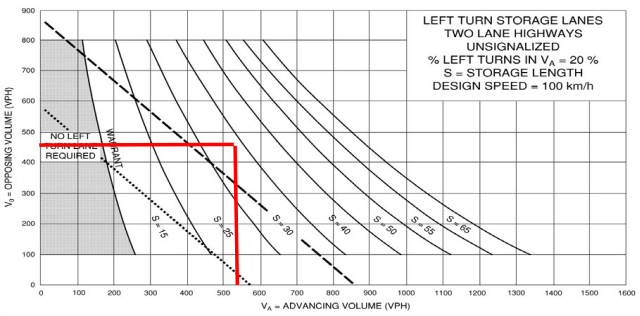
APPENDIX D

MTO Warrants

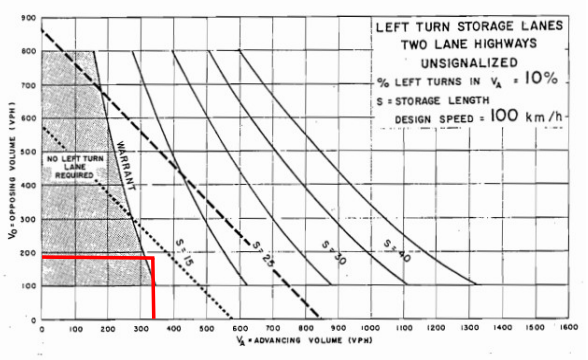
2032 FT

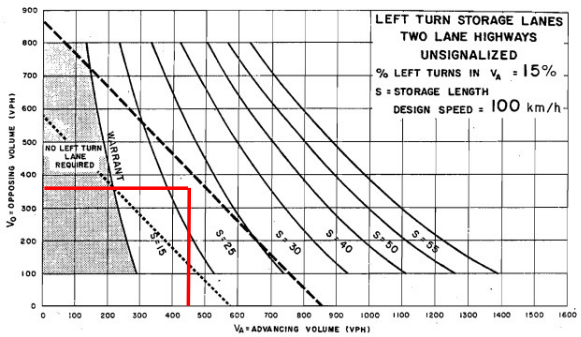
McLeod Access at Street 'B'	
WB Left	
AM	
Vo	275
Va	348
LT	26
%	7%
PM	
Vo	445
Va	527
LT	89
%	17%



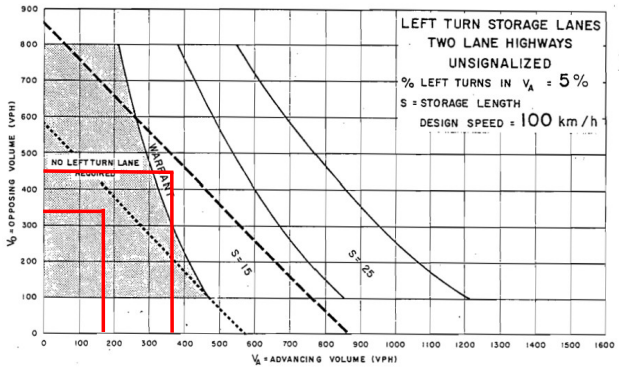


McLeod Road at Beechwood	
WB Left	
AM	
Vo	188
Va	324
LT	18
%	6%
PM	
Vo	377
Va	436
LT	61
%	14%



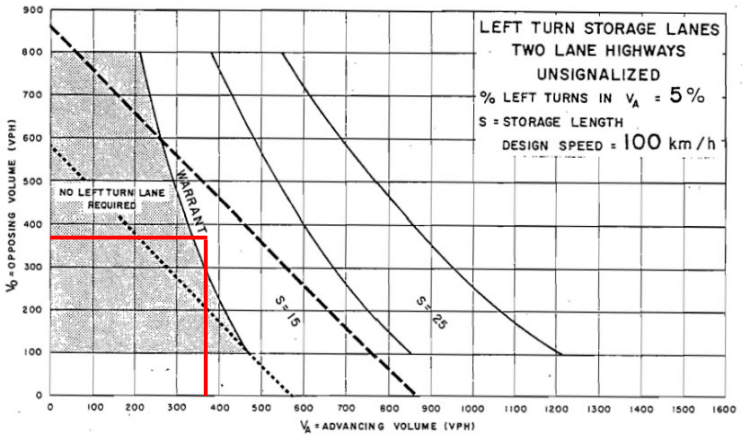


McLeod Road at Beechwood	
EB Left	
AM	
Vo	324
Va	188
LT	2
%	1%
PM	
Vo	436
Va	377
LT	2
%	1%

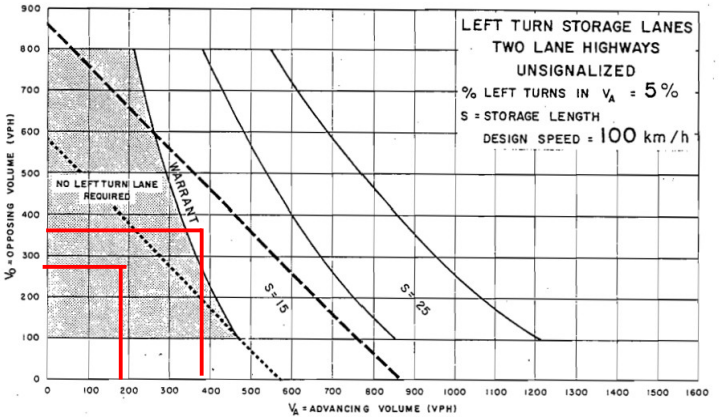


2032 FB

McLeod Road at Beechwood	
WB Left	
AM	
Vo	185
Va	278
LT	1
%	0%
PM	
Vo	366
Va	358
LT	2
%	1%



McLeod Road at Beechwood	
EB Left	
AM	
Vo	278
Va	185
LT	2
%	1%
PM	
Vo	358
Va	366
LT	2
%	1%



Beechwood/McLeod - (peak hour signal warrant)

Signal Warrant		Description		Minimum Requirement for Two-Lane Roadways	Compliance		
				Free Flow - Operating Speed Greater Than or Equal to 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	480	85%	85%	**85% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	120	277%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	480	15%	15%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	50	346%		

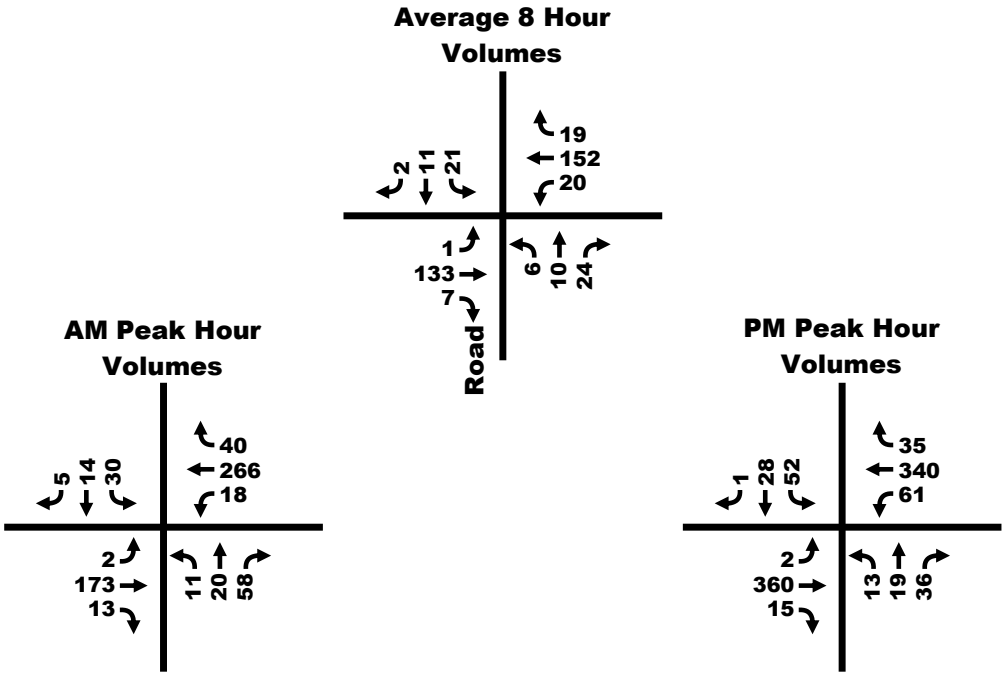
Notes

1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* **No**

2 *For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08*

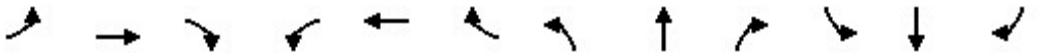
3 *The Lowest Sectional Percentage Governs the Entire Warrant*

4 *For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)* **No**



APPENDIX E

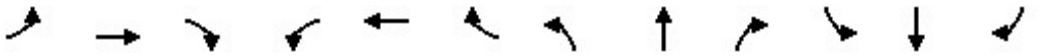
Synchro Software Output Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	134	10	1	194	14	6	4	4	19	7	4
Future Volume (Veh/h)	2	134	10	1	194	14	6	4	4	19	7	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	146	11	1	211	15	7	4	4	21	8	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	226			157			384	384	152	382	382	218
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	226			157			384	384	152	382	382	218
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			100			99	99	100	96	99	100
cM capacity (veh/h)	1354			1435			548	552	900	573	536	826

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	159	227	15	33
Volume Left	2	1	7	21
Volume Right	11	15	4	4
cSH	1354	1435	613	585
Volume to Capacity	0.00	0.00	0.02	0.06
Queue Length 95th (m)	0.0	0.0	0.6	1.4
Control Delay (s)	0.1	0.0	11.0	11.5
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	0.0	11.0	11.5
Approach LOS			B	B

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	21.6%	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 (veh/h)	9	146	13	74	179	45	19	21	113	23	8	33
Future Volume (Veh/h)	9	146	13	74	179	45	19	21	113	23	8	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	159	14	80	195	49	21	23	123	25	9	36
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	244			173			606	590	166	700	572	220
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	244			173			606	590	166	700	572	220
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			94	94	86	91	98	96
cM capacity (veh/h)	1311			1386			368	395	873	278	405	825

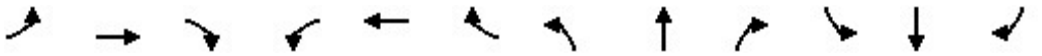
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	183	324	167	70
Volume Left	10	80	21	25
Volume Right	14	49	123	36
cSH	1311	1386	652	450
Volume to Capacity	0.01	0.06	0.26	0.16
Queue Length 95th (m)	0.2	1.5	8.1	4.4
Control Delay (s)	0.5	2.3	12.4	14.5
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	2.3	12.4	14.5
Approach LOS			B	B

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	44.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	450	51	324	220	92	290	350	267
v/c Ratio	0.20	0.35	0.23	0.39	0.43	0.32	0.59	0.74	0.16
Control Delay	15.0	14.8	25.8	23.6	9.6	23.3	21.6	22.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	14.8	25.8	23.6	9.6	23.3	21.6	22.8	4.5
Queue Length 50th (m)	5.7	18.9	5.2	17.8	3.9	9.0	23.2	24.5	3.3
Queue Length 95th (m)	15.3	34.6	16.2	34.3	22.4	23.0	51.8	#65.1	10.4
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	441	2695	525	2010	987	702	1099	500	2706
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.10	0.16	0.22	0.13	0.26	0.70	0.10

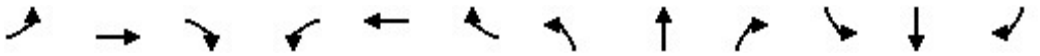
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	370	44	47	298	202	85	118	149	322	99	146
Future Volume (vph)	69	370	44	47	298	202	85	118	149	322	99	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.92		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3468		1805	3574	1615	1805	1707		1805	3198	
Flt Permitted	0.37	1.00		0.49	1.00	1.00	0.59	1.00		0.28	1.00	
Satd. Flow (perm)	698	3468		935	3574	1615	1116	1707		526	3198	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	402	48	51	324	220	92	128	162	350	108	159
RTOR Reduction (vph)	0	9	0	0	0	138	0	48	0	0	80	0
Lane Group Flow (vph)	75	441	0	51	324	82	92	242	0	350	187	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	20.8	20.8		11.9	11.9	11.9	13.8	13.8		28.1	28.1	
Effective Green, g (s)	19.8	23.2		14.3	14.3	14.3	16.2	16.2		27.1	30.5	
Actuated g/C Ratio	0.32	0.38		0.23	0.23	0.23	0.26	0.26		0.44	0.50	
Clearance Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	310	1306		217	829	374	293	448		445	1583	
v/s Ratio Prot	0.02	c0.13			0.09			0.14		c0.13	0.06	
v/s Ratio Perm	0.06			0.05		0.05	0.08			c0.21		
v/c Ratio	0.24	0.34		0.24	0.39	0.22	0.31	0.54		0.79	0.12	
Uniform Delay, d1	15.0	13.7		19.2	20.0	19.1	18.2	19.5		12.9	8.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1		0.4	0.2	0.2	0.4	1.1		8.6	0.0	
Delay (s)	15.3	13.8		19.6	20.2	19.3	18.7	20.6		21.5	8.4	
Level of Service	B	B		B	C	B	B	C		C	A	
Approach Delay (s)		14.0			19.8			20.1			15.8	
Approach LOS		B			B			C			B	

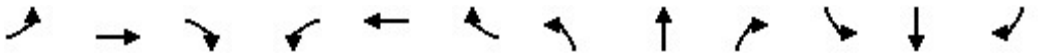
Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	15.9
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	271	9	2	263	16	9	7	1	22	9	1
Future Volume (Veh/h)	2	271	9	2	263	16	9	7	1	22	9	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	295	10	2	286	17	10	8	1	24	10	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	303			305			608	611	300	608	608	294
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303			305			608	611	300	608	608	294
tC, single (s)	4.1			4.1			7.2	6.5	6.5	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.6	3.5	4.0	3.4
p0 queue free %	100			100			97	98	100	94	98	100
cM capacity (veh/h)	1269			1267			381	410	680	398	408	731

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	307	305	19	35
Volume Left	2	2	10	24
Volume Right	10	17	1	1
cSH	1269	1267	402	406
Volume to Capacity	0.00	0.00	0.05	0.09
Queue Length 95th (m)	0.0	0.0	1.2	2.3
Control Delay (s)	0.1	0.1	14.4	14.7
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	0.1	14.4	14.7
Approach LOS			B	B

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	26.1%	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 (veh/h)	27	244	21	73	257	36	25	34	80	21	5	16
Future Volume (Veh/h)	27	244	21	73	257	36	25	34	80	21	5	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	265	23	79	279	39	27	37	87	23	5	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	318			288			810	810	276	896	802	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	318			288			810	810	276	896	802	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			94			90	87	89	88	98	98
cM capacity (veh/h)	1231			1257			271	289	758	197	292	746

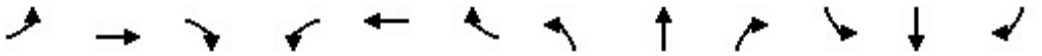
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	317	397	151	45
Volume Left	29	79	27	23
Volume Right	23	39	87	17
cSH	1231	1257	441	287
Volume to Capacity	0.02	0.06	0.34	0.16
Queue Length 95th (m)	0.6	1.6	12.0	4.4
Control Delay (s)	0.9	2.1	17.4	19.9
Lane LOS	A	A	C	C
Approach Delay (s)	0.9	2.1	17.4	19.9
Approach LOS			C	C

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	452	129	516	428	41	321	324	181
v/c Ratio	0.29	0.32	0.49	0.51	0.69	0.13	0.64	0.78	0.11
Control Delay	16.3	14.9	32.1	25.3	19.1	24.4	28.0	31.4	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	14.9	32.1	25.3	19.1	24.4	28.0	31.4	8.9
Queue Length 50th (m)	8.2	21.1	15.8	33.5	25.9	4.5	34.0	28.6	4.4
Queue Length 95th (m)	20.7	39.3	38.9	59.1	69.4	14.5	74.9	#90.4	13.1
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	391	2366	458	1756	905	667	972	439	2452
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.19	0.28	0.29	0.47	0.06	0.33	0.74	0.07

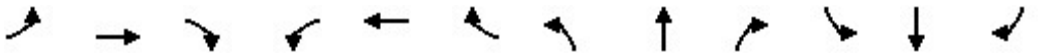
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	380	36	119	475	394	38	147	148	298	105	62
Future Volume (vph)	89	380	36	119	475	394	38	147	148	298	105	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3482		1805	3574	1615	1805	1723		1805	3339	
Flt Permitted	0.26	1.00		0.49	1.00	1.00	0.64	1.00		0.25	1.00	
Satd. Flow (perm)	488	3482		933	3574	1615	1212	1723		467	3339	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	413	39	129	516	428	41	160	161	324	114	67
RTOR Reduction (vph)	0	7	0	0	0	158	0	38	0	0	35	0
Lane Group Flow (vph)	97	445	0	129	516	270	41	283	0	324	146	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	28.0	28.0		18.2	18.2	18.2	17.5	17.5		32.2	32.2	
Effective Green, g (s)	27.0	30.4		20.6	20.6	20.6	19.9	19.9		31.2	34.6	
Actuated g/C Ratio	0.37	0.42		0.28	0.28	0.28	0.27	0.27		0.43	0.47	
Clearance Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	284	1452		263	1009	456	330	470		396	1584	
v/s Ratio Prot	0.03	c0.13			0.14			0.16		c0.12	0.04	
v/s Ratio Perm	0.10			0.14		c0.17	0.03			c0.23		
v/c Ratio	0.34	0.31		0.49	0.51	0.59	0.12	0.60		0.82	0.09	
Uniform Delay, d1	15.9	14.2		21.8	21.9	22.5	19.9	23.1		15.9	10.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.1		1.0	0.3	1.7	0.1	1.8		12.1	0.0	
Delay (s)	16.5	14.3		22.8	22.3	24.3	20.1	24.9		27.9	10.5	
Level of Service	B	B		C	C	C	C	C		C	B	
Approach Delay (s)		14.7			23.1			24.4			21.7	
Approach LOS		B			C			C			C	

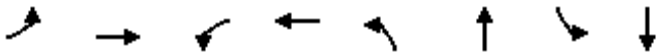
Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	72.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	155	11	1	236	15	7	4	4	21	8	4
Future Volume (Veh/h)	2	155	11	1	236	15	7	4	4	21	8	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	168	12	1	257	16	8	4	4	23	9	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	273			180			454	453	174	451	451	265
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			180			454	453	174	451	451	265
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			100			98	99	100	96	98	99
cM capacity (veh/h)	1302			1408			491	504	875	516	490	779

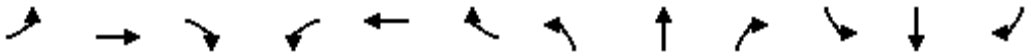
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	182	274	16	36
Volume Left	2	1	8	23
Volume Right	12	16	4	4
cSH	1302	1408	556	528
Volume to Capacity	0.00	0.00	0.03	0.07
Queue Length 95th (m)	0.0	0.0	0.7	1.7
Control Delay (s)	0.1	0.0	11.7	12.3
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	0.0	11.7	12.3
Approach LOS			B	B

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	23.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	32	232	96	301	23	214	29	64
v/c Ratio	0.06	0.24	0.16	0.32	0.06	0.39	0.08	0.13
Control Delay	5.3	5.7	6.1	5.9	7.5	5.1	7.6	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	5.7	6.1	5.9	7.5	5.1	7.6	4.5
Queue Length 50th (m)	0.6	4.7	2.0	5.8	0.6	1.3	0.7	0.4
Queue Length 95th (m)	3.1	13.7	7.2	17.0	3.2	9.3	3.7	4.5
Internal Link Dist (m)		652.6		705.2		278.8		326.3
Turn Bay Length (m)								
Base Capacity (vph)	1054	1846	1111	1777	1012	1262	994	1275
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.13	0.09	0.17	0.02	0.17	0.03	0.05

Intersection Summary



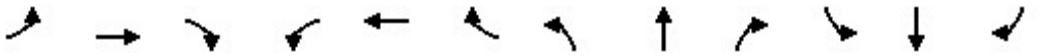
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	200	14	88	223	54	21	50	147	27	17	42
Future Volume (vph)	29	200	14	88	223	54	21	50	147	27	17	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1847		1719	1777		1805	1638		1805	1695	
Flt Permitted	0.58	1.00		0.61	1.00		0.72	1.00		0.70	1.00	
Satd. Flow (perm)	1053	1847		1111	1777		1359	1638		1333	1695	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	217	15	96	242	59	23	54	160	29	18	46
RTOR Reduction (vph)	0	5	0	0	17	0	0	126	0	0	36	0
Lane Group Flow (vph)	32	227	0	96	284	0	23	88	0	29	28	0
Heavy Vehicles (%)	4%	2%	0%	5%	4%	3%	0%	0%	4%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.8	12.8		12.8	12.8		5.7	5.7		5.7	5.7	
Effective Green, g (s)	12.8	12.8		12.8	12.8		5.7	5.7		5.7	5.7	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	508	892		536	858		292	352		286	364	
v/s Ratio Prot		0.12			c0.16			c0.05			0.02	
v/s Ratio Perm	0.03			0.09			0.02			0.02		
v/c Ratio	0.06	0.25		0.18	0.33		0.08	0.25		0.10	0.08	
Uniform Delay, d1	3.7	4.0		3.9	4.2		8.3	8.6		8.3	8.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.2	0.2		0.1	0.4		0.2	0.1	
Delay (s)	3.7	4.2		4.0	4.4		8.4	9.0		8.5	8.4	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		4.1			4.3			8.9			8.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	26.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	612	66	390	241	103	369	447	324
v/c Ratio	0.41	0.57	0.38	0.49	0.49	0.35	0.72	0.77	0.16
Control Delay	27.3	25.5	37.1	31.2	14.0	29.1	31.3	25.7	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	25.5	37.1	31.2	14.0	29.1	31.3	25.7	3.7
Queue Length 50th (m)	12.6	43.8	9.7	31.1	10.2	13.8	46.6	44.1	4.4
Queue Length 95th (m)	26.2	65.5	23.6	48.2	32.8	30.4	85.2	#104.6	11.4
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	250	2001	355	1632	829	388	665	642	2358
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.31	0.19	0.24	0.29	0.27	0.55	0.70	0.14

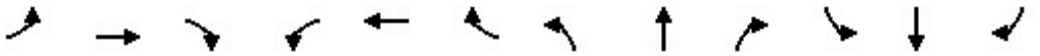
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	510	53	61	359	222	95	145	194	411	122	176
Future Volume (vph)	95	510	53	61	359	222	95	145	194	411	122	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3476		1805	3574	1615	1805	1703		1805	3202	
Flt Permitted	0.29	1.00		0.41	1.00	1.00	0.56	1.00		0.18	1.00	
Satd. Flow (perm)	552	3476		779	3574	1615	1056	1703		349	3202	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	554	58	66	390	241	103	158	211	447	133	191
RTOR Reduction (vph)	0	9	0	0	0	132	0	44	0	0	79	0
Lane Group Flow (vph)	103	603	0	66	390	109	103	325	0	447	245	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	22.8	22.8		15.3	15.3	15.3	19.7	19.7		44.4	44.4	
Effective Green, g (s)	21.8	25.2		17.7	17.7	17.7	22.1	22.1		43.4	46.8	
Actuated g/C Ratio	0.27	0.32		0.22	0.22	0.22	0.28	0.28		0.54	0.59	
Clearance Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	204	1096		172	791	357	292	471		566	1875	
v/s Ratio Prot	0.02	c0.17			0.11			0.19		c0.20	0.08	
v/s Ratio Perm	0.12			0.08		0.07	0.10			c0.22		
v/c Ratio	0.50	0.55		0.38	0.49	0.31	0.35	0.69		0.79	0.13	
Uniform Delay, d1	23.0	22.7		26.5	27.2	26.0	23.2	25.8		16.5	7.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.5		1.0	0.4	0.4	0.5	3.8		7.0	0.0	
Delay (s)	24.4	23.1		27.5	27.5	26.3	23.7	29.7		23.5	7.4	
Level of Service	C	C		C	C	C	C	C		C	A	
Approach Delay (s)		23.3			27.1			28.4			16.8	
Approach LOS		C			C			C			B	

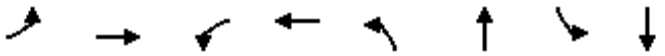
Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	79.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	320	10	2	304	18	10	8	1	24	10	1
Future Volume (Veh/h)	2	320	10	2	304	18	10	8	1	24	10	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	348	11	2	330	20	11	9	1	26	11	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	350			359			708	712	354	707	707	340
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	350			359			708	712	354	707	707	340
tC, single (s)	4.1			4.1			7.2	6.5	6.5	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.6	3.5	4.0	3.4
p0 queue free %	100			100			97	97	100	92	97	100
cM capacity (veh/h)	1220			1211			324	359	633	339	358	689

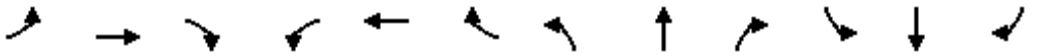
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	361	352	21	38
Volume Left	2	2	11	26
Volume Right	11	20	1	1
cSH	1220	1211	347	349
Volume to Capacity	0.00	0.00	0.06	0.11
Queue Length 95th (m)	0.0	0.0	1.5	2.9
Control Delay (s)	0.1	0.1	16.1	16.6
Lane LOS	A	A	C	C
Approach Delay (s)	0.1	0.1	16.1	16.6
Approach LOS			C	C

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	28.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	354	113	406	30	169	32	76
v/c Ratio	0.08	0.33	0.20	0.39	0.09	0.34	0.10	0.17
Control Delay	5.1	5.9	6.0	6.3	9.3	6.3	9.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	5.9	6.0	6.3	9.3	6.3	9.3	6.3
Queue Length 50th (m)	0.9	7.9	2.4	9.3	0.9	1.7	0.9	1.0
Queue Length 95th (m)	4.1	21.7	8.7	25.4	4.8	11.1	5.1	7.1
Internal Link Dist (m)		652.6		705.2		278.8		326.3
Turn Bay Length (m)								
Base Capacity (vph)	946	1824	982	1776	926	1183	919	1218
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.19	0.12	0.23	0.03	0.14	0.03	0.06

Intersection Summary



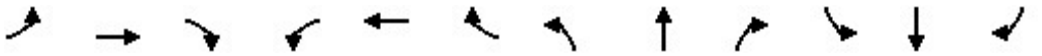
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	303	23	104	329	44	28	53	102	29	33	37
Future Volume (vph)	41	303	23	104	329	44	28	53	102	29	33	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.90		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1846		1719	1797		1805	1669		1805	1750	
Flt Permitted	0.52	1.00		0.55	1.00		0.71	1.00		0.70	1.00	
Satd. Flow (perm)	957	1846		994	1797		1344	1669		1333	1750	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	329	25	113	358	48	30	58	111	32	36	40
RTOR Reduction (vph)	0	5	0	0	9	0	0	89	0	0	32	0
Lane Group Flow (vph)	45	349	0	113	397	0	30	80	0	32	44	0
Heavy Vehicles (%)	4%	2%	0%	5%	4%	3%	0%	0%	4%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.1	15.1		15.1	15.1		5.7	5.7		5.7	5.7	
Effective Green, g (s)	15.1	15.1		15.1	15.1		5.7	5.7		5.7	5.7	
Actuated g/C Ratio	0.52	0.52		0.52	0.52		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	501	967		521	942		266	330		263	346	
v/s Ratio Prot		0.19			c0.22			c0.05			0.03	
v/s Ratio Perm	0.05			0.11			0.02			0.02		
v/c Ratio	0.09	0.36		0.22	0.42		0.11	0.24		0.12	0.13	
Uniform Delay, d1	3.4	4.0		3.7	4.2		9.5	9.7		9.5	9.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.2	0.3		0.2	0.4		0.2	0.2	
Delay (s)	3.5	4.3		3.9	4.5		9.7	10.1		9.7	9.7	
Level of Service	A	A		A	A		A	B		A	A	
Approach Delay (s)		4.2			4.4			10.0			9.7	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	28.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	567	173	680	471	51	392	405	255
v/c Ratio	0.62	0.41	0.70	0.64	0.77	0.17	0.80	0.87	0.14
Control Delay	35.7	21.7	47.0	32.2	27.5	31.2	43.8	41.5	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	21.7	47.0	32.2	27.5	31.2	43.8	41.5	7.4
Queue Length 50th (m)	17.6	44.4	32.1	64.9	55.0	8.0	66.3	56.7	7.4
Queue Length 95th (m)	#34.1	59.2	58.0	84.4	95.5	19.2	#120.3	#115.8	15.2
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	207	1695	321	1377	739	350	566	535	2054
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.33	0.54	0.49	0.64	0.15	0.69	0.76	0.12

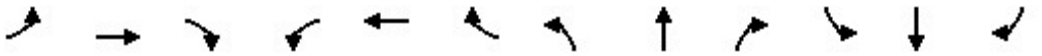
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	479	42	159	626	433	47	179	181	373	138	97
Future Volume (vph)	119	479	42	159	626	433	47	179	181	373	138	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3485		1805	3574	1615	1805	1722		1805	3313	
Flt Permitted	0.17	1.00		0.44	1.00	1.00	0.59	1.00		0.16	1.00	
Satd. Flow (perm)	318	3485		834	3574	1615	1128	1722		300	3313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	521	46	173	680	471	51	195	197	405	150	105
RTOR Reduction (vph)	0	6	0	0	0	132	0	34	0	0	51	0
Lane Group Flow (vph)	129	561	0	173	680	339	51	358	0	405	204	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	34.7	34.7		25.5	25.5	25.5	22.3	22.3		45.9	45.9	
Effective Green, g (s)	33.7	37.1		27.9	27.9	27.9	24.7	24.7		44.9	48.3	
Actuated g/C Ratio	0.36	0.40		0.30	0.30	0.30	0.26	0.26		0.48	0.52	
Clearance Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	196	1385		249	1068	482	298	455		460	1715	
v/s Ratio Prot	c0.04	0.16			0.19			0.21		c0.18	0.06	
v/s Ratio Perm	0.20			0.21		c0.21	0.05			c0.24		
v/c Ratio	0.66	0.41		0.69	0.64	0.70	0.17	0.79		0.88	0.12	
Uniform Delay, d1	22.2	20.2		28.9	28.3	29.0	26.4	31.9		23.4	11.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.9	0.1		7.5	1.1	4.3	0.2	8.4		17.5	0.0	
Delay (s)	29.2	20.3		36.5	29.4	33.3	26.6	40.3		40.9	11.6	
Level of Service	C	C		D	C	C	C	D		D	B	
Approach Delay (s)		22.0			31.7			38.7			29.6	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	93.3	Sum of lost time (s)	15.9
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 (veh/h)	2	157	12	18	242	38	11	19	57	28	13	4
Future Volume (Veh/h)	2	157	12	18	242	38	11	19	57	28	13	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	171	13	20	263	41	12	21	62	30	14	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	304			184			516	526	178	578	512	284
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			184			516	526	178	578	512	284
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			99			97	95	93	92	97	99
cM capacity (veh/h)	1268			1403			437	453	871	381	446	760

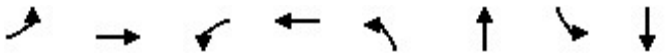
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	186	324	95	48
Volume Left	2	20	12	30
Volume Right	13	41	62	4
cSH	1268	1403	655	416
Volume to Capacity	0.00	0.01	0.15	0.12
Queue Length 95th (m)	0.0	0.3	4.0	3.1
Control Delay (s)	0.1	0.6	11.4	14.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	0.6	11.4	14.8
Approach LOS			B	B

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	41.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	246	9	26	294	29	80
Future Volume (Veh/h)	246	9	26	294	29	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)	267	10	28	320	32	87
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			277		648	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			277		648	272
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		93	89
cM capacity (veh/h)			1298		429	772

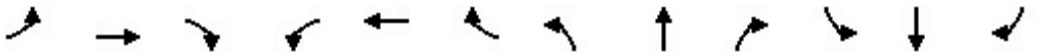
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	277	28	320	119
Volume Left	0	28	0	32
Volume Right	10	0	0	87
cSH	1700	1298	1700	635
Volume to Capacity	0.16	0.02	0.19	0.19
Queue Length 95th (m)	0.0	0.5	0.0	5.5
Control Delay (s)	0.0	7.8	0.0	12.0
Lane LOS		A		B
Approach Delay (s)	0.0	0.6		12.0
Approach LOS				B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	32	377	96	348	23	214	29	64
v/c Ratio	0.06	0.37	0.18	0.35	0.07	0.40	0.09	0.14
Control Delay	5.1	6.4	6.1	6.0	8.4	5.6	8.6	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	6.4	6.1	6.0	8.4	5.6	8.6	5.1
Queue Length 50th (m)	0.6	8.5	2.0	7.2	0.6	1.5	0.8	0.5
Queue Length 95th (m)	3.2	23.9	7.7	21.0	3.7	10.9	4.3	5.3
Internal Link Dist (m)		652.6		705.2		278.8		326.3
Turn Bay Length (m)								
Base Capacity (vph)	1005	1847	971	1779	958	1202	925	1209
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.20	0.10	0.20	0.02	0.18	0.03	0.05

Intersection Summary



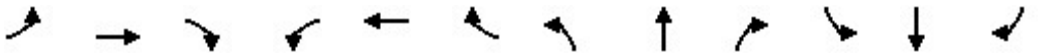
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	333	14	88	266	54	21	50	147	27	17	42
Future Volume (vph)	29	333	14	88	266	54	21	50	147	27	17	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1853		1719	1783		1805	1638		1805	1695	
Flt Permitted	0.55	1.00		0.54	1.00		0.72	1.00		0.69	1.00	
Satd. Flow (perm)	1009	1853		973	1783		1359	1638		1310	1695	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	362	15	96	289	59	23	54	160	29	18	46
RTOR Reduction (vph)	0	3	0	0	13	0	0	127	0	0	36	0
Lane Group Flow (vph)	32	374	0	96	335	0	23	87	0	29	28	0
Heavy Vehicles (%)	4%	2%	0%	5%	4%	3%	0%	0%	4%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.2	14.2		14.2	14.2		5.8	5.8		5.8	5.8	
Effective Green, g (s)	14.2	14.2		14.2	14.2		5.8	5.8		5.8	5.8	
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	511	939		493	904		281	339		271	351	
v/s Ratio Prot		c0.20			0.19			c0.05			0.02	
v/s Ratio Perm	0.03			0.10			0.02			0.02		
v/c Ratio	0.06	0.40		0.19	0.37		0.08	0.26		0.11	0.08	
Uniform Delay, d1	3.5	4.3		3.8	4.2		9.0	9.3		9.0	8.9	
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		0.2	0.3		0.1	0.4		0.2	0.1	
Delay (s)	3.6	4.5		4.0	4.4		9.1	9.7		9.2	9.0	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		4.5			4.3			9.6			9.1	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	28.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	757	66	437	241	103	369	447	324
v/c Ratio	0.41	0.65	0.49	0.49	0.47	0.36	0.73	0.80	0.17
Control Delay	26.5	27.0	43.6	30.6	15.1	31.1	33.6	30.1	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	27.0	43.6	30.6	15.1	31.1	33.6	30.1	4.2
Queue Length 50th (m)	12.7	58.0	10.2	35.6	13.1	14.2	47.8	47.5	4.6
Queue Length 95th (m)	25.9	82.9	25.3	53.3	35.8	32.9	91.8	#120.4	13.2
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	253	1932	241	1570	793	373	642	614	2279
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.39	0.27	0.28	0.30	0.28	0.57	0.73	0.14

Intersection Summary

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



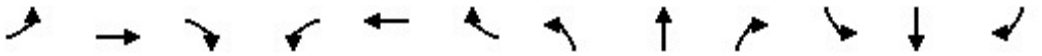
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	643	53	61	402	222	95	145	194	411	122	176
Future Volume (vph)	95	643	53	61	402	222	95	145	194	411	122	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3488		1805	3574	1615	1805	1703		1805	3202	
Flt Permitted	0.28	1.00		0.29	1.00	1.00	0.56	1.00		0.17	1.00	
Satd. Flow (perm)	528	3488		551	3574	1615	1056	1703		330	3202	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	699	58	66	437	241	103	158	211	447	133	191
RTOR Reduction (vph)	0	7	0	0	0	113	0	45	0	0	82	0
Lane Group Flow (vph)	103	750	0	66	437	128	103	324	0	447	242	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	25.5	25.5		18.0	18.0	18.0	20.0	20.0		44.8	44.8	
Effective Green, g (s)	24.5	27.9		20.4	20.4	20.4	22.4	22.4		43.8	47.2	
Actuated g/C Ratio	0.30	0.34		0.25	0.25	0.25	0.27	0.27		0.53	0.57	
Clearance Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	208	1172		135	878	396	284	459		543	1820	
v/s Ratio Prot	0.02	c0.22			0.12			0.19		c0.21	0.08	
v/s Ratio Perm	0.12			0.12		0.08	0.10			c0.23		
v/c Ratio	0.50	0.64		0.49	0.50	0.32	0.36	0.71		0.82	0.13	
Uniform Delay, d1	22.6	23.3		26.8	26.9	25.6	24.5	27.3		18.6	8.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	1.1		2.0	0.3	0.3	0.6	4.6		9.6	0.0	
Delay (s)	24.0	24.4		28.9	27.2	26.0	25.1	31.9		28.2	8.4	
Level of Service	C	C		C	C	C	C	C		C	A	
Approach Delay (s)		24.3			27.0			30.4			19.9	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	72	15	4	23	21
Future Volume (Veh/h)	9	72	15	4	23	21
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	78	16	4	25	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	91	18			20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	91	18			20	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	93			98	
cM capacity (veh/h)	900	1066			1609	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	88	20	48
Volume Left	10	0	25
Volume Right	78	4	0
cSH	1044	1700	1609
Volume to Capacity	0.08	0.01	0.02
Queue Length 95th (m)	2.2	0.0	0.4
Control Delay (s)	8.8	0.0	3.8
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	3.8
Approach LOS	A		

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	20.7%	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 (veh/h)	2	327	14	61	308	33	12	18	36	49	27	1
Future Volume (Veh/h)	2	327	14	61	308	33	12	18	36	49	27	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	355	15	66	335	36	13	20	39	53	29	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	371			370			867	870	362	900	859	353
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371			370			867	870	362	900	859	353
tC, single (s)	4.1			4.1			7.2	6.5	6.5	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.6	3.5	4.0	3.4
p0 queue free %	100			94			94	93	94	76	90	100
cM capacity (veh/h)	1199			1200			228	276	626	218	276	677

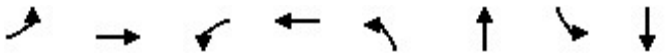
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	372	437	72	83
Volume Left	2	66	13	53
Volume Right	15	36	39	1
cSH	1199	1200	375	237
Volume to Capacity	0.00	0.06	0.19	0.35
Queue Length 95th (m)	0.0	1.4	5.6	12.0
Control Delay (s)	0.1	1.7	16.9	28.1
Lane LOS	A	A	C	D
Approach Delay (s)	0.1	1.7	16.9	28.1
Approach LOS			C	D

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	60.6%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	378	32	89	402	19	52
Future Volume (Veh/h)	378	32	89	402	19	52
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)	411	35	97	437	21	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			446		1060	428
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			446		1060	428
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		91	91
cM capacity (veh/h)			1125		229	631

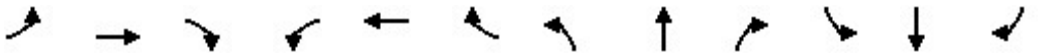
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	446	97	437	78
Volume Left	0	97	0	21
Volume Right	35	0	0	57
cSH	1700	1125	1700	428
Volume to Capacity	0.26	0.09	0.26	0.18
Queue Length 95th (m)	0.0	2.3	0.0	5.3
Control Delay (s)	0.0	8.5	0.0	15.3
Lane LOS		A		C
Approach Delay (s)	0.0	1.5		15.3
Approach LOS				C

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	449	113	566	30	169	32	76
v/c Ratio	0.10	0.39	0.21	0.50	0.10	0.37	0.11	0.18
Control Delay	5.0	5.9	5.7	7.0	12.1	7.9	12.2	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	5.9	5.7	7.0	12.1	7.9	12.2	8.2
Queue Length 50th (m)	0.9	11.1	2.5	15.3	1.1	2.2	1.2	1.3
Queue Length 95th (m)	4.7	31.6	9.9	43.8	6.5	14.7	6.7	9.4
Internal Link Dist (m)		652.6		705.2		278.8		326.3
Turn Bay Length (m)								
Base Capacity (vph)	685	1753	835	1711	816	1056	781	1077
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.26	0.14	0.33	0.04	0.16	0.04	0.07

Intersection Summary



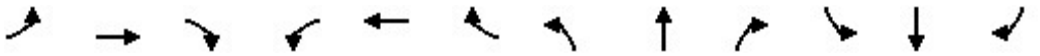
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	390	23	104	477	44	28	53	102	29	33	37
Future Volume (vph)	41	390	23	104	477	44	28	53	102	29	33	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1849		1719	1805		1805	1669		1805	1750	
Flt Permitted	0.40	1.00		0.49	1.00		0.71	1.00		0.68	1.00	
Satd. Flow (perm)	723	1849		881	1805		1344	1669		1288	1750	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	424	25	113	518	48	30	58	111	32	36	40
RTOR Reduction (vph)	0	3	0	0	5	0	0	91	0	0	33	0
Lane Group Flow (vph)	45	446	0	113	561	0	30	78	0	32	43	0
Heavy Vehicles (%)	4%	2%	0%	5%	4%	3%	0%	0%	4%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.1	19.1		19.1	19.1		5.9	5.9		5.9	5.9	
Effective Green, g (s)	19.1	19.1		19.1	19.1		5.9	5.9		5.9	5.9	
Actuated g/C Ratio	0.58	0.58		0.58	0.58		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	418	1070		509	1044		240	298		230	312	
v/s Ratio Prot		0.24			c0.31			c0.05			0.02	
v/s Ratio Perm	0.06			0.13			0.02			0.02		
v/c Ratio	0.11	0.42		0.22	0.54		0.12	0.26		0.14	0.14	
Uniform Delay, d1	3.1	3.9		3.4	4.2		11.4	11.7		11.4	11.4	
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		0.2	0.5		0.2	0.5		0.3	0.2	
Delay (s)	3.2	4.1		3.6	4.8		11.6	12.1		11.7	11.6	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		4.0			4.6			12.1			11.6	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	33.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	661	173	841	471	51	392	405	255
v/c Ratio	0.72	0.46	0.73	0.74	0.77	0.18	0.82	0.88	0.15
Control Delay	45.4	22.4	50.9	35.0	29.9	32.1	46.4	44.9	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	22.4	50.9	35.0	29.9	32.1	46.4	44.9	7.8
Queue Length 50th (m)	17.6	53.6	33.0	85.0	63.1	8.7	71.9	63.5	8.4
Queue Length 95th (m)	#41.1	70.1	#66.8	108.3	104.6	19.2	#120.3	#116.4	15.2
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	179	1626	276	1319	692	335	544	515	1971
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.41	0.63	0.64	0.68	0.15	0.72	0.79	0.13

Intersection Summary

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



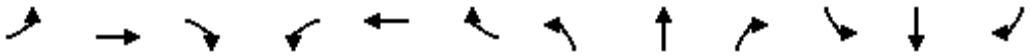
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	566	42	159	774	433	47	179	181	373	138	97
Future Volume (vph)	119	566	42	159	774	433	47	179	181	373	138	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3493		1805	3574	1615	1805	1722		1805	3313	
Flt Permitted	0.13	1.00		0.39	1.00	1.00	0.59	1.00		0.16	1.00	
Satd. Flow (perm)	240	3493		748	3574	1615	1128	1722		297	3313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	615	46	173	841	471	51	195	197	405	150	105
RTOR Reduction (vph)	0	5	0	0	0	104	0	34	0	0	52	0
Lane Group Flow (vph)	129	656	0	173	841	367	51	358	0	405	203	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	37.5	37.5		28.4	28.4	28.4	22.6	22.6		46.6	46.6	
Effective Green, g (s)	36.5	39.9		30.8	30.8	30.8	25.0	25.0		45.6	49.0	
Actuated g/C Ratio	0.38	0.41		0.32	0.32	0.32	0.26	0.26		0.47	0.51	
Clearance Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	172	1439		238	1137	513	291	444		451	1677	
v/s Ratio Prot	c0.04	0.19			c0.24			0.21		c0.19	0.06	
v/s Ratio Perm	0.24			0.23		0.23	0.05			c0.24		
v/c Ratio	0.75	0.46		0.73	0.74	0.71	0.18	0.81		0.90	0.12	
Uniform Delay, d1	23.1	20.6		29.3	29.4	29.1	27.9	33.6		25.0	12.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.9	0.2		9.9	2.4	4.4	0.2	10.0		20.1	0.0	
Delay (s)	39.1	20.8		39.2	31.8	33.5	28.1	43.6		45.1	12.6	
Level of Service	D	C		D	C	C	C	D		D	B	
Approach Delay (s)		23.7			33.2			41.8			32.6	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	96.8	Sum of lost time (s)	15.9
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	47	19	10	80	22
Future Volume (Veh/h)	6	47	19	10	80	22
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)	7	51	21	11	87	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	224	26			32	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	224	26			32	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	95			95	
cM capacity (veh/h)	726	1055			1593	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	58	32	111
Volume Left	7	0	87
Volume Right	51	11	0
cSH	1000	1700	1593
Volume to Capacity	0.06	0.02	0.05
Queue Length 95th (m)	1.5	0.0	1.4
Control Delay (s)	8.8	0.0	5.9
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	5.9
Approach LOS	A		

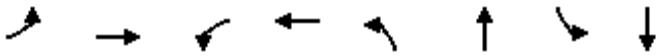
Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	22.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	171	12	1	260	17	7	5	5	23	9	5
Future Volume (Veh/h)	2	171	12	1	260	17	7	5	5	23	9	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	186	13	1	283	18	8	5	5	25	10	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	301			199			492	500	192	498	497	292
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	301			199			492	500	192	498	497	292
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			100			98	99	99	95	98	99
cM capacity (veh/h)	1272			1385			461	475	854	478	461	752

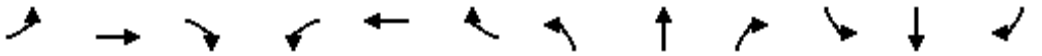
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	201	1	301	18	40
Volume Left	2	1	0	8	25
Volume Right	13	0	18	5	5
cSH	1272	1385	1700	534	496
Volume to Capacity	0.00	0.00	0.18	0.03	0.08
Queue Length 95th (m)	0.0	0.0	0.0	0.8	2.1
Control Delay (s)	0.1	7.6	0.0	12.0	12.9
Lane LOS	A	A		B	B
Approach Delay (s)	0.1	0.0		12.0	12.9
Approach LOS				B	B

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	24.7%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	253	105	329	25	233	33	70
v/c Ratio	0.07	0.30	0.21	0.40	0.07	0.43	0.11	0.15
Control Delay	5.4	6.2	6.5	6.7	8.1	5.6	8.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	6.2	6.5	6.7	8.1	5.6	8.6	4.9
Queue Length 50th (m)	0.6	5.2	2.2	6.7	0.6	1.5	0.9	0.5
Queue Length 95th (m)	3.4	15.7	8.3	20.0	3.8	11.3	4.7	5.4
Internal Link Dist (m)		652.6		705.2		278.8		326.3
Turn Bay Length (m)								
Base Capacity (vph)	1012	1821	1073	1752	935	1186	806	1189
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.14	0.10	0.19	0.03	0.20	0.04	0.06

Intersection Summary



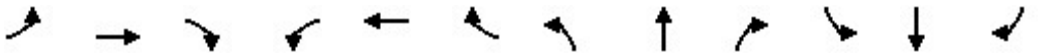
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	217	16	97	244	59	23	53	161	30	18	46
Future Volume (vph)	30	217	16	97	244	59	23	53	161	30	18	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1846		1719	1777		1805	1637		1805	1696	
Flt Permitted	0.56	1.00		0.60	1.00		0.71	1.00		0.61	1.00	
Satd. Flow (perm)	1027	1846		1090	1777		1352	1637		1166	1696	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	236	17	105	265	64	25	58	175	33	20	50
RTOR Reduction (vph)	0	5	0	0	17	0	0	130	0	0	37	0
Lane Group Flow (vph)	33	248	0	105	312	0	25	103	0	33	33	0
Heavy Vehicles (%)	4%	2%	0%	5%	4%	3%	0%	0%	4%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.9	12.9		12.9	12.9		7.2	7.2		7.2	7.2	
Effective Green, g (s)	12.9	12.9		12.9	12.9		7.2	7.2		7.2	7.2	
Actuated g/C Ratio	0.46	0.46		0.46	0.46		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	471	847		500	815		346	419		298	434	
v/s Ratio Prot		0.13			c0.18			c0.06			0.02	
v/s Ratio Perm	0.03			0.10			0.02			0.03		
v/c Ratio	0.07	0.29		0.21	0.38		0.07	0.25		0.11	0.08	
Uniform Delay, d1	4.2	4.7		4.5	5.0		7.9	8.3		8.0	7.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.2	0.3		0.1	0.3		0.2	0.1	
Delay (s)	4.3	4.9		4.8	5.3		8.0	8.6		8.2	8.0	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		4.9			5.2			8.5			8.1	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	28.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	112	666	72	429	267	114	403	489	356
v/c Ratio	0.49	0.62	0.49	0.53	0.54	0.40	0.77	0.83	0.18
Control Delay	30.6	28.0	43.7	32.8	16.7	31.3	35.8	34.0	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	28.0	43.7	32.8	16.7	31.3	35.8	34.0	3.9
Queue Length 50th (m)	14.4	51.3	11.4	36.1	15.3	16.0	54.5	59.9	5.1
Queue Length 95th (m)	28.6	73.5	27.0	53.7	40.3	35.7	101.6	#145.2	13.8
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	229	1729	252	1393	730	362	643	588	2223
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.39	0.29	0.31	0.37	0.31	0.63	0.83	0.16

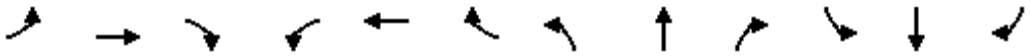
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	554	59	66	395	246	105	159	212	450	134	193
Future Volume (vph)	103	554	59	66	395	246	105	159	212	450	134	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3475		1805	3574	1615	1805	1703		1805	3202	
Flt Permitted	0.26	1.00		0.34	1.00	1.00	0.54	1.00		0.16	1.00	
Satd. Flow (perm)	497	3475		648	3574	1615	1024	1703		304	3202	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	602	64	72	429	267	114	173	230	489	146	210
RTOR Reduction (vph)	0	8	0	0	0	128	0	45	0	0	85	0
Lane Group Flow (vph)	112	658	0	72	429	139	114	358	0	489	271	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	25.0	25.0		17.4	17.4	17.4	22.0	22.0		49.5	49.5	
Effective Green, g (s)	24.0	27.4		19.8	19.8	19.8	24.4	24.4		48.5	51.9	
Actuated g/C Ratio	0.28	0.31		0.23	0.23	0.23	0.28	0.28		0.56	0.60	
Clearance Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	190	1091		147	811	366	286	476		573	1905	
v/s Ratio Prot	0.02	c0.19			0.12			0.21		c0.23	0.08	
v/s Ratio Perm	0.14			0.11		0.09	0.11			c0.24		
v/c Ratio	0.59	0.60		0.49	0.53	0.38	0.40	0.75		0.85	0.14	
Uniform Delay, d1	26.3	25.3		29.3	29.6	28.5	25.5	28.6		20.7	7.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.8	0.8		1.9	0.5	0.5	0.7	6.3		11.7	0.0	
Delay (s)	30.1	26.1		31.2	30.1	29.0	26.1	35.0		32.4	7.8	
Level of Service	C	C		C	C	C	C	C		C	A	
Approach Delay (s)		26.7			29.8			33.0			22.0	
Approach LOS		C			C			C			C	

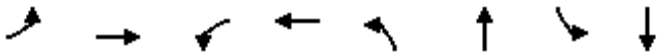
Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	87.2	Sum of lost time (s)	15.9
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	353	11	2	336	20	11	9	1	27	11	1
Future Volume (Veh/h)	2	353	11	2	336	20	11	9	1	27	11	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	384	12	2	365	22	12	10	1	29	12	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	387			396			770	785	390	780	780	376
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	387			396			770	785	390	780	780	376
tC, single (s)	4.1			4.1			7.2	6.5	6.5	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.6	3.5	4.0	3.4
p0 queue free %	100			100			96	97	100	90	96	100
cM capacity (veh/h)	1183			1174			292	326	603	302	324	657

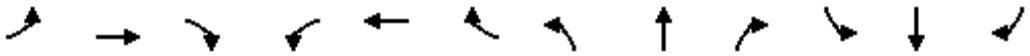
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	398	2	387	23	42
Volume Left	2	2	0	12	29
Volume Right	12	0	22	1	1
cSH	1183	1174	1700	313	312
Volume to Capacity	0.00	0.00	0.23	0.07	0.13
Queue Length 95th (m)	0.0	0.0	0.0	1.9	3.7
Control Delay (s)	0.1	8.1	0.0	17.4	18.3
Lane LOS	A	A		C	C
Approach Delay (s)	0.1	0.0		17.4	18.3
Approach LOS				C	C

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	30.8%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	48	390	123	443	34	184	35	78
v/c Ratio	0.09	0.36	0.22	0.42	0.10	0.37	0.11	0.17
Control Delay	5.2	6.1	6.2	6.6	10.0	6.6	10.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	6.1	6.2	6.6	10.0	6.6	10.0	6.7
Queue Length 50th (m)	1.0	9.1	2.7	10.5	1.0	1.9	1.0	1.1
Queue Length 95th (m)	4.5	25.5	10.1	29.9	5.7	12.6	5.8	7.7
Internal Link Dist (m)		652.6		705.2		278.8		326.3
Turn Bay Length (m)								
Base Capacity (vph)	875	1804	940	1757	900	1159	879	1185
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.22	0.13	0.25	0.04	0.16	0.04	0.07

Intersection Summary



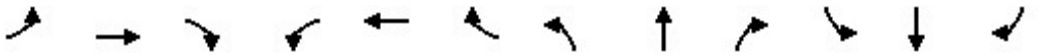
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	333	26	113	360	48	31	57	112	32	33	39
Future Volume (vph)	44	333	26	113	360	48	31	57	112	32	33	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.90		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1845		1719	1797		1805	1667		1805	1747	
Flt Permitted	0.49	1.00		0.53	1.00		0.71	1.00		0.69	1.00	
Satd. Flow (perm)	895	1845		961	1797		1342	1667		1310	1747	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	362	28	123	391	52	34	62	122	35	36	42
RTOR Reduction (vph)	0	5	0	0	8	0	0	98	0	0	34	0
Lane Group Flow (vph)	48	385	0	123	435	0	34	86	0	35	44	0
Heavy Vehicles (%)	4%	2%	0%	5%	4%	3%	0%	0%	4%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.8	15.8		15.8	15.8		5.8	5.8		5.8	5.8	
Effective Green, g (s)	15.8	15.8		15.8	15.8		5.8	5.8		5.8	5.8	
Actuated g/C Ratio	0.53	0.53		0.53	0.53		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	477	984		512	959		262	326		256	342	
v/s Ratio Prot		0.21			c0.24			c0.05			0.03	
v/s Ratio Perm	0.05			0.13			0.03			0.03		
v/c Ratio	0.10	0.39		0.24	0.45		0.13	0.26		0.14	0.13	
Uniform Delay, d1	3.4	4.1		3.7	4.2		9.8	10.1		9.8	9.8	
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		0.2	0.3		0.2	0.4		0.2	0.2	
Delay (s)	3.5	4.3		3.9	4.6		10.0	10.5		10.1	10.0	
Level of Service	A	A		A	A		B	B		B	A	
Approach Delay (s)		4.2			4.4			10.4			10.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	29.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	621	188	742	523	55	429	445	277
v/c Ratio	0.79	0.75	0.67	0.71	0.86	0.18	0.85	0.92	0.15
Control Delay	57.6	42.2	34.0	35.9	37.1	31.1	48.9	51.2	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	42.2	34.0	35.9	37.1	31.1	48.9	51.2	7.3
Queue Length 50th (m)	20.1	65.3	27.5	74.4	71.5	9.1	79.4	75.1	8.8
Queue Length 95th (m)	#49.0	87.3	44.7	95.9	#131.4	19.9	#132.3	#137.8	15.6
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	178	901	317	1201	667	337	558	503	1968
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.69	0.59	0.62	0.78	0.16	0.77	0.88	0.14

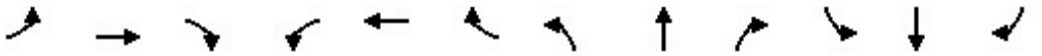
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	525	46	173	683	481	51	196	199	409	150	105
Future Volume (vph)	130	525	46	173	683	481	51	196	199	409	150	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3485		1805	3574	1615	1805	1722		1805	3313	
Flt Permitted	0.20	1.00		0.16	1.00	1.00	0.58	1.00		0.14	1.00	
Satd. Flow (perm)	371	3485		313	3574	1615	1105	1722		273	3313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	571	50	188	742	523	55	213	216	445	163	114
RTOR Reduction (vph)	0	6	0	0	0	132	0	34	0	0	53	0
Lane Group Flow (vph)	141	615	0	188	742	391	55	395	0	445	224	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	27.4	21.3		36.1	27.0	27.0	24.8	24.8		50.9	50.9	
Effective Green, g (s)	25.4	23.7		35.1	29.4	29.4	27.2	27.2		49.9	53.3	
Actuated g/C Ratio	0.25	0.24		0.35	0.29	0.29	0.27	0.27		0.50	0.53	
Clearance Time (s)	3.0	6.4		3.0	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	3.0	2.5		3.0	2.5	2.5	2.5	2.5		3.0	2.5	
Lane Grp Cap (vph)	166	828		271	1053	476	301	469		476	1771	
v/s Ratio Prot	0.04	0.18		c0.07	0.21			0.23		c0.21	0.07	
v/s Ratio Perm	0.17			0.17		c0.24	0.05			c0.26		
v/c Ratio	0.85	0.74		0.69	0.70	0.82	0.18	0.84		0.93	0.13	
Uniform Delay, d1	32.6	35.2		25.1	31.3	32.7	27.7	34.2		27.2	11.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.2	3.4		7.5	2.0	10.7	0.2	12.7		25.7	0.0	
Delay (s)	63.8	38.6		32.6	33.3	43.4	28.0	46.9		52.9	11.6	
Level of Service	E	D		C	C	D	C	D		D	B	
Approach Delay (s)		43.3			36.8			44.8			37.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	99.7	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.6%	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 (veh/h)	2	173	13	18	266	40	11	20	58	30	14	5
Future Volume (Veh/h)	2	173	13	18	266	40	11	20	58	30	14	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	188	14	20	289	43	12	22	63	33	15	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	332			202			562	571	195	624	556	310
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	332			202			562	571	195	624	556	310
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			99			97	95	93	91	96	99
cM capacity (veh/h)	1239			1382			405	427	851	352	420	734

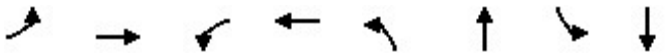
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	204	352	97	53
Volume Left	2	20	12	33
Volume Right	14	43	63	5
cSH	1239	1382	625	389
Volume to Capacity	0.00	0.01	0.16	0.14
Queue Length 95th (m)	0.0	0.4	4.4	3.7
Control Delay (s)	0.1	0.6	11.8	15.7
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.6	11.8	15.7
Approach LOS			B	C

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	43.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	266	9	26	322	29	80
Future Volume (Veh/h)	266	9	26	322	29	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)	289	10	28	350	32	87
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			299		700	294
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			299		700	294
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		92	88
cM capacity (veh/h)			1274		400	750

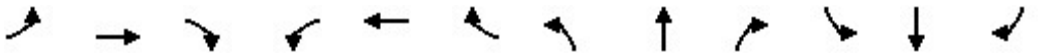
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	299	28	350	119
Volume Left	0	28	0	32
Volume Right	10	0	0	87
cSH	1700	1274	1700	607
Volume to Capacity	0.18	0.02	0.21	0.20
Queue Length 95th (m)	0.0	0.5	0.0	5.8
Control Delay (s)	0.0	7.9	0.0	12.4
Lane LOS		A		B
Approach Delay (s)	0.0	0.6		12.4
Approach LOS				B

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	397	105	376	25	233	33	70
v/c Ratio	0.07	0.45	0.24	0.44	0.08	0.44	0.12	0.15
Control Delay	5.3	7.4	6.8	7.0	9.0	6.1	9.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	7.4	6.8	7.0	9.0	6.1	9.5	5.4
Queue Length 50th (m)	0.6	9.3	2.2	8.1	0.7	1.6	0.9	0.6
Queue Length 95th (m)	3.5	26.9	9.0	24.4	4.3	12.7	5.3	6.1
Internal Link Dist (m)		652.6		705.2		278.8		326.3
Turn Bay Length (m)								
Base Capacity (vph)	949	1793	904	1725	892	1139	769	1137
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.22	0.12	0.22	0.03	0.20	0.04	0.06

Intersection Summary



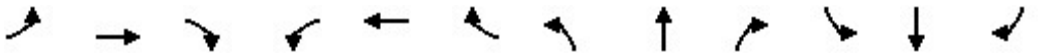
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	350	16	97	287	59	23	53	161	30	18	46
Future Volume (vph)	30	350	16	97	287	59	23	53	161	30	18	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1852		1719	1783		1805	1637		1805	1696	
Flt Permitted	0.54	1.00		0.52	1.00		0.71	1.00		0.61	1.00	
Satd. Flow (perm)	981	1852		933	1783		1352	1637		1166	1696	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	380	17	105	312	64	25	58	175	33	20	50
RTOR Reduction (vph)	0	3	0	0	14	0	0	132	0	0	38	0
Lane Group Flow (vph)	33	394	0	105	362	0	25	101	0	33	32	0
Heavy Vehicles (%)	4%	2%	0%	5%	4%	3%	0%	0%	4%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.2	14.2		14.2	14.2		7.3	7.3		7.3	7.3	
Effective Green, g (s)	14.2	14.2		14.2	14.2		7.3	7.3		7.3	7.3	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	472	891		449	858		334	405		288	419	
v/s Ratio Prot		c0.21			0.20			c0.06			0.02	
v/s Ratio Perm	0.03			0.11			0.02			0.03		
v/c Ratio	0.07	0.44		0.23	0.42		0.07	0.25		0.11	0.08	
Uniform Delay, d1	4.1	5.0		4.5	5.0		8.5	8.9		8.6	8.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4		0.3	0.3		0.1	0.3		0.2	0.1	
Delay (s)	4.2	5.4		4.7	5.3		8.6	9.2		8.8	8.6	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		5.3			5.2			9.2			8.7	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	29.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	112	811	72	476	267	114	403	489	356
v/c Ratio	0.48	0.69	0.62	0.52	0.51	0.41	0.79	0.87	0.18
Control Delay	29.1	29.3	56.1	31.8	17.0	33.7	39.1	39.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	29.3	56.1	31.8	17.0	33.7	39.1	39.7	4.6
Queue Length 50th (m)	14.6	67.3	12.2	41.2	18.2	16.9	57.5	65.2	5.7
Queue Length 95th (m)	28.2	92.3	29.9	59.2	43.4	37.8	#114.8	#156.8	15.2
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	235	1662	170	1336	697	348	620	563	2140
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.49	0.42	0.36	0.38	0.33	0.65	0.87	0.17

Intersection Summary

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



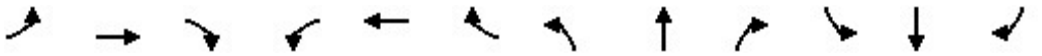
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	687	59	66	438	246	105	159	212	450	134	193
Future Volume (vph)	103	687	59	66	438	246	105	159	212	450	134	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3487		1805	3574	1615	1805	1703		1805	3202	
Flt Permitted	0.26	1.00		0.24	1.00	1.00	0.54	1.00		0.16	1.00	
Satd. Flow (perm)	487	3487		456	3574	1615	1024	1703		300	3202	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	747	64	72	476	267	114	173	230	489	146	210
RTOR Reduction (vph)	0	7	0	0	0	111	0	45	0	0	89	0
Lane Group Flow (vph)	112	804	0	72	476	156	114	358	0	489	267	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	28.4	28.4		20.8	20.8	20.8	22.3	22.3		49.8	49.8	
Effective Green, g (s)	27.4	30.8		23.2	23.2	23.2	24.7	24.7		48.8	52.2	
Actuated g/C Ratio	0.30	0.34		0.26	0.26	0.26	0.27	0.27		0.54	0.57	
Clearance Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	198	1181		116	912	412	278	462		550	1838	
v/s Ratio Prot	0.02	c0.23			0.13			0.21		c0.23	0.08	
v/s Ratio Perm	0.15			0.16		0.10	0.11			c0.25		
v/c Ratio	0.57	0.68		0.62	0.52	0.38	0.41	0.77		0.89	0.15	
Uniform Delay, d1	25.8	25.8		30.0	29.1	27.9	27.1	30.5		22.8	9.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	1.5		8.6	0.4	0.4	0.7	7.6		16.0	0.0	
Delay (s)	28.8	27.3		38.6	29.5	28.3	27.8	38.2		38.7	9.0	
Level of Service	C	C		D	C	C	C	D		D	A	
Approach Delay (s)		27.5			29.9			35.9			26.2	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	72	17	4	23	22
Future Volume (Veh/h)	9	72	17	4	23	22
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	78	18	4	25	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	94	20			22	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	94	20			22	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	93			98	
cM capacity (veh/h)	896	1064			1607	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	88	22	49
Volume Left	10	0	25
Volume Right	78	4	0
cSH	1042	1700	1607
Volume to Capacity	0.08	0.01	0.02
Queue Length 95th (m)	2.2	0.0	0.4
Control Delay (s)	8.8	0.0	3.8
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	3.8
Approach LOS	A		

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	20.7%	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 (veh/h)	2	360	15	61	340	35	13	19	36	52	28	1
Future Volume (Veh/h)	2	360	15	61	340	35	13	19	36	52	28	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	391	16	66	370	38	14	21	39	57	30	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	408			407			940	943	399	974	932	389
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	408			407			940	943	399	974	932	389
tC, single (s)	4.1			4.1			7.2	6.5	6.5	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.6	3.5	4.0	3.4
p0 queue free %	100			94			93	92	93	70	88	100
cM capacity (veh/h)	1162			1163			200	249	596	192	250	646

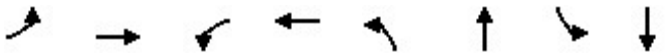
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	409	474	74	88
Volume Left	2	66	14	57
Volume Right	16	38	39	1
cSH	1162	1163	337	210
Volume to Capacity	0.00	0.06	0.22	0.42
Queue Length 95th (m)	0.0	1.4	6.6	15.4
Control Delay (s)	0.1	1.7	18.7	34.0
Lane LOS	A	A	C	D
Approach Delay (s)	0.1	1.7	18.7	34.0
Approach LOS			C	D

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	413	32	89	438	19	52
Future Volume (Veh/h)	413	32	89	438	19	52
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)	449	35	97	476	21	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			484		1136	466
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			484		1136	466
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		90	91
cM capacity (veh/h)			1089		205	600

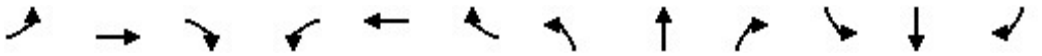
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	484	97	476	78
Volume Left	0	97	0	21
Volume Right	35	0	0	57
cSH	1700	1089	1700	395
Volume to Capacity	0.28	0.09	0.28	0.20
Queue Length 95th (m)	0.0	2.3	0.0	5.8
Control Delay (s)	0.0	8.6	0.0	16.3
Lane LOS		A		C
Approach Delay (s)	0.0	1.5		16.3
Approach LOS				C

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	48	485	123	604	34	184	35	78
v/c Ratio	0.11	0.42	0.24	0.53	0.11	0.39	0.12	0.18
Control Delay	5.2	6.2	6.1	7.4	12.8	8.2	13.0	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	6.2	6.1	7.4	12.8	8.2	13.0	8.5
Queue Length 50th (m)	1.0	12.6	2.8	17.3	1.4	2.5	1.4	1.4
Queue Length 95th (m)	5.1	35.9	11.3	49.8	7.4	16.3	7.6	10.0
Internal Link Dist (m)		652.6		705.2		278.8		326.3
Turn Bay Length (m)								
Base Capacity (vph)	624	1718	768	1678	795	1039	739	1053
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.28	0.16	0.36	0.04	0.18	0.05	0.07

Intersection Summary



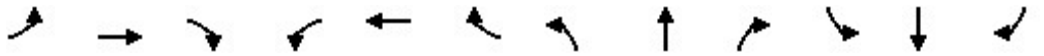
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	420	26	113	508	48	31	57	112	32	33	39
Future Volume (vph)	44	420	26	113	508	48	31	57	112	32	33	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1849		1719	1805		1805	1667		1805	1747	
Flt Permitted	0.37	1.00		0.46	1.00		0.71	1.00		0.66	1.00	
Satd. Flow (perm)	672	1849		828	1805		1342	1667		1246	1747	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	457	28	123	552	52	34	62	122	35	36	42
RTOR Reduction (vph)	0	3	0	0	5	0	0	100	0	0	34	0
Lane Group Flow (vph)	48	482	0	123	599	0	34	84	0	35	44	0
Heavy Vehicles (%)	4%	2%	0%	5%	4%	3%	0%	0%	4%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.9	19.9		19.9	19.9		6.1	6.1		6.1	6.1	
Effective Green, g (s)	19.9	19.9		19.9	19.9		6.1	6.1		6.1	6.1	
Actuated g/C Ratio	0.59	0.59		0.59	0.59		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	393	1082		484	1056		240	299		223	313	
v/s Ratio Prot		0.26			c0.33			c0.05			0.02	
v/s Ratio Perm	0.07			0.15			0.03			0.03		
v/c Ratio	0.12	0.45		0.25	0.57		0.14	0.28		0.16	0.14	
Uniform Delay, d1	3.1	4.0		3.4	4.4		11.7	12.1		11.8	11.7	
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		0.3	0.7		0.3	0.5		0.3	0.2	
Delay (s)	3.3	4.2		3.7	5.1		12.0	12.6		12.1	11.9	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		4.2			4.8			12.5			12.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	34.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	715	188	903	523	55	429	445	277
v/c Ratio	0.82	0.82	0.68	0.83	0.87	0.18	0.86	0.93	0.15
Control Delay	61.1	45.9	34.9	41.0	40.8	31.3	50.1	54.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.1	45.9	34.9	41.0	40.8	31.3	50.1	54.4	7.4
Queue Length 50th (m)	20.1	78.0	27.5	96.1	79.6	9.1	79.4	75.5	8.8
Queue Length 95th (m)	#47.9	#110.7	44.7	121.6	#142.2	19.9	#132.3	#138.4	15.6
Internal Link Dist (m)		289.8		341.5			422.1		342.7
Turn Bay Length (m)	25.0		40.0		15.0	20.0		130.0	
Base Capacity (vph)	173	892	309	1170	632	328	545	491	1920
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.80	0.61	0.77	0.83	0.17	0.79	0.91	0.14

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	612	46	173	831	481	51	196	199	409	150	105
Future Volume (vph)	130	612	46	173	831	481	51	196	199	409	150	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.9	3.9		4.0	3.9	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3493		1805	3574	1615	1805	1722		1805	3313	
Flt Permitted	0.18	1.00		0.15	1.00	1.00	0.58	1.00		0.14	1.00	
Satd. Flow (perm)	344	3493		293	3574	1615	1105	1722		270	3313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	665	50	188	903	523	55	213	216	445	163	114
RTOR Reduction (vph)	0	5	0	0	0	107	0	34	0	0	54	0
Lane Group Flow (vph)	141	710	0	188	903	416	55	395	0	445	223	0
Heavy Vehicles (%)	1%	2%	6%	0%	1%	0%	0%	2%	2%	0%	1%	4%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	29.0	22.9		37.8	28.7	28.7	25.1	25.1		51.4	51.4	
Effective Green, g (s)	27.0	25.3		36.8	31.1	31.1	27.5	27.5		50.4	53.8	
Actuated g/C Ratio	0.26	0.25		0.36	0.31	0.31	0.27	0.27		0.49	0.53	
Clearance Time (s)	3.0	6.4		3.0	6.4	6.4	6.3	6.3		3.0	6.3	
Vehicle Extension (s)	3.0	2.5		3.0	2.5	2.5	2.5	2.5		3.0	2.5	
Lane Grp Cap (vph)	163	867		267	1090	492	298	464		469	1749	
v/s Ratio Prot	0.04	0.20		c0.08	0.25			0.23		c0.21	0.07	
v/s Ratio Perm	0.19			0.18		c0.26	0.05			c0.26		
v/c Ratio	0.87	0.82		0.70	0.83	0.85	0.18	0.85		0.95	0.13	
Uniform Delay, d1	34.0	36.1		25.6	32.9	33.2	28.6	35.3		28.3	12.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	34.9	5.9		8.2	5.2	12.4	0.2	13.8		28.7	0.0	
Delay (s)	68.8	42.1		33.7	38.1	45.6	28.8	49.0		57.0	12.2	
Level of Service	E	D		C	D	D	C	D		E	B	
Approach Delay (s)		46.5			40.0			46.7			39.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	47	21	10	80	24
Future Volume (Veh/h)	6	47	21	10	80	24
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)	7	51	23	11	87	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	228	28			34	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	228	28			34	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	95			95	
cM capacity (veh/h)	722	1052			1591	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	58	34	113
Volume Left	7	0	87
Volume Right	51	11	0
cSH	997	1700	1591
Volume to Capacity	0.06	0.02	0.05
Queue Length 95th (m)	1.5	0.0	1.4
Control Delay (s)	8.8	0.0	5.8
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	5.8
Approach LOS	A		

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		