Simcoe County Service Campus

City of Orillia

Traffic Impact Study for:

McKnight Charron Limited Architects

Type of Document:
Final Report

Project Number:
JDE – 20115

Date Submitted:
November 13th, 2020

John Northcote, P.Eng.
Professional License #: 100124071

ENGINEERING

JD Northcote Engineering Inc.
86 Cumberland Street
Barrie, ON
705.725.4035
www.JDEngineering.ca

Legal Notification

This report was prepared by **JD Northcote Engineering Inc.** for the account of **McKnight Charron Limited Architects**.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. **JD Northcote Engineering Inc.** accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

Executive Summary

This report summarizes the traffic impact study prepared for the proposed affordable housing development located on the east side of West Street North between Borland Street West and North Street East in the City of Orillia [City]. The report assesses the impact of traffic related to the development on the adjacent roadway and provides recommendations to accommodate this traffic in a safe and efficient manner.

The proposed development includes a 6 storey, 130-unit affordable housing building with approximately 4,055 m^2 (43,653 ft^2) of leasable office/commercial space. It is anticipated that ultimate build-out will occur by 2022.

The proposed development will include one full-movement access driveway onto West Street North [West Access] and one full-movement access driveway onto Peter Street North [East Access].

The scope of this analysis includes a review of the following intersections:

- West Street N / North Street;
- West Street N / Borland Street
- Peter Street / North Street;
- Peter Street / Borland Street;
- West Street N / Fittons Road;
- West Street N / Brant Street;
- West Street N / West Access; and
- Peter Street / East Access.

Conclusions

1. The proposed development is expected to generate a total of 147 AM and 141 PM peak hour trips.
2. Detailed intersection counts were obtained and conducted at the study intersections.
3. An intersection operation analysis was completed at the study area intersections, using the existing and background (2022 and 2032) traffic volumes. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed development. No improvements are recommended within the study area.
4. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area roads and intersections.
5. An intersection operation analysis was completed under total (2022 and 2032) traffic volumes with the proposed development operational at the study area intersections. No improvements are recommended within the study area.
6. The proposed site accesses will operate efficiently with one-way stop control for egress movements. A single lane for ingress and egress movements will provide the necessary capacity to convey the traffic volume generated by the proposed development.
7. The sight distance available for the proposed site accesses is suitable for the intended use.
8. The location of the proposed site access connections are considered appropriate with respect to minimum corner clearance and spacing requirements as identified in the Transportation Association of Canada Design Guide for Canadian Roads (2017).
9. The proposed parking supply for the residential units within the subject site is 1.04 parking spaces / unit, which is less that the City's By-Law requirement of 1.5 parking spaces / unit. Based on our parking analysis, the proposed parking supply considered sufficient for the

intended use. The proposed 9 barrier-free parking spaces meets the City's By-Law requirement and the proposed 70 bicycle parking spaces exceeds the City's By-Law requirement.

10. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

Table of Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

1.1 Background

McKnight Charron Limited Architects [the Developer] is proposing an affordable housing development located on the the east side of West Street North between Borland Street West and North Street East in the City of Orillia [City].

The proposed development includes a 6 storey, 130-unit affordable housing building with approximately 4,055 m^2 (43,653 ft^2) of leasable office/commercial space. It is anticipated that ultimate build-out will occur by 2022.

The proposed development will include one full-movement access driveway onto West Street North [West Access] and one full-movement access driveway onto Peter Street North [East Access].

The Developer has retained **JD Northcote Engineering Inc.** [JD Engineering] to prepare this traffic brief in support of the proposed development.

1.2 Study Area

Figure 1 illustrates the location of the subject site and study area intersections in relation to the surrounding area. The Site Plan by McKnight Charron Limited Architects is shown in **Appendix A**. The subject site is bound by North Street East to the north, Borland Street East to the south West Street North to the west, and Peter Street North to the east.

Through consultation with City staff, the following intersections are included in the traffic impact study:

- West Street N / North Street;
- West Street N / Borland Street
- Peter Street / North Street;
- Peter Street / Borland Street;
- West Street N / Fitton Road;
- West Street N / Brant Street;
- West Street N / West Access; and
- Peter Street / East Access.

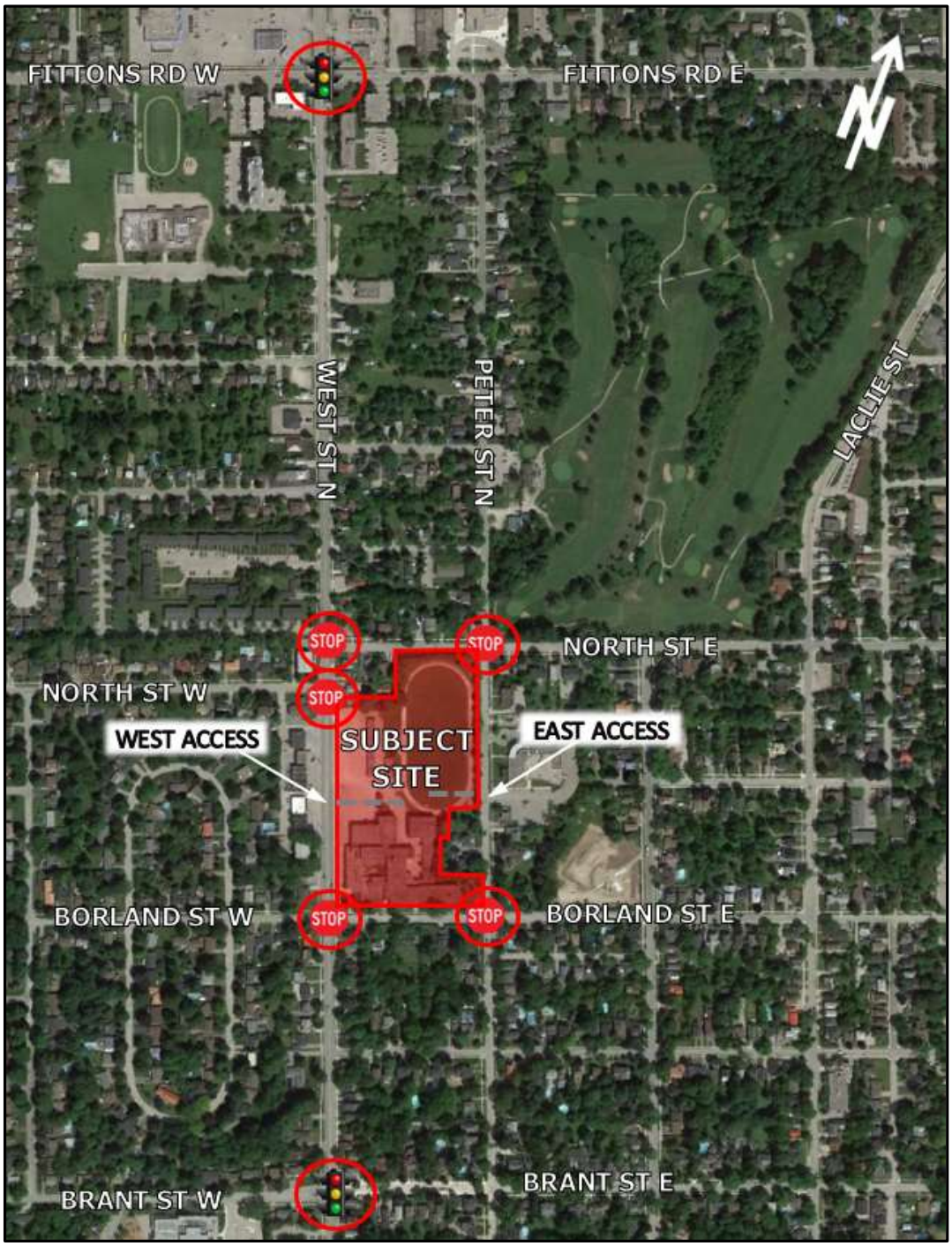
1.3 Study Scope and Objectives

The purpose of this study is to identify the potential impacts to traffic flow at the site access and on the surrounding roadway network. The study analysis includes the following tasks:

- Determine existing traffic volumes and circulation patterns;
- Estimate future traffic volumes if the proposed development was not constructed, including the impact of additional proposed developments in the area;
- Complete level-of-service [LOS] analysis of horizon year (without the proposed development) traffic conditions and identify operational deficiencies;
- Estimate the amount of traffic that would be generated by the proposed development and assign to the roadway network;
- Complete LOS analysis of horizon year (with the proposed development) traffic conditions and identify additional operational deficiencies;
- Identify improvement options to address operational deficiencies;

- Review the available sight distance at the proposed site access driveways;
- Complete a review of the proposed intersection spacing;
- Review the proposed parking supply in relation to City standards; and
- Document findings and recommendations in a final report.

Figure 1 – Proposed Site Location and Study Area



1.4 Analysis Periods

Traffic scenarios for the existing year, ultimate buildout horizon year (2022) and 10-year post-buildout horizon year (2032) were selected for analysis of traffic operations in the study area. Given the residential nature of the development, the weekday morning [AM] and weekday afternoon [PM] peak hours have been selected as the analysis periods for this study.

2 Information Gathering

2.1 Street and Intersection Characteristics

West Street North is a three-lane (one lane per direction with a centre turn lane) arterial road with an urban cross-section and sidewalk on both sides of the road within the study area. North of Fittons Road, West Street North transitions to a four-lane cross-section. West Street North has a posted speed limit of 50km/h and is under the jurisdiction of the City.

Fittons Road is a four-lane (two lanes per direction) arterial road with an urban cross-section and sidewalk on both sides of the road within the study area. Approximately 100 metres east of West Street North, Fittons Road transitions to a two-lane cross-section. Fittons Road has a posted speed limit of 50km/h and is under the jurisdiction of the City.

North Street is a two-lane collector road with a semi-urban cross-section (grassed shoulders, open ditches) and sidewalk on the north side of the road. East of Peter Street, sidewalk transitions to the south side of the road. North Street has a posted speed limit of 50km/h and is under the jurisdiction of the City.

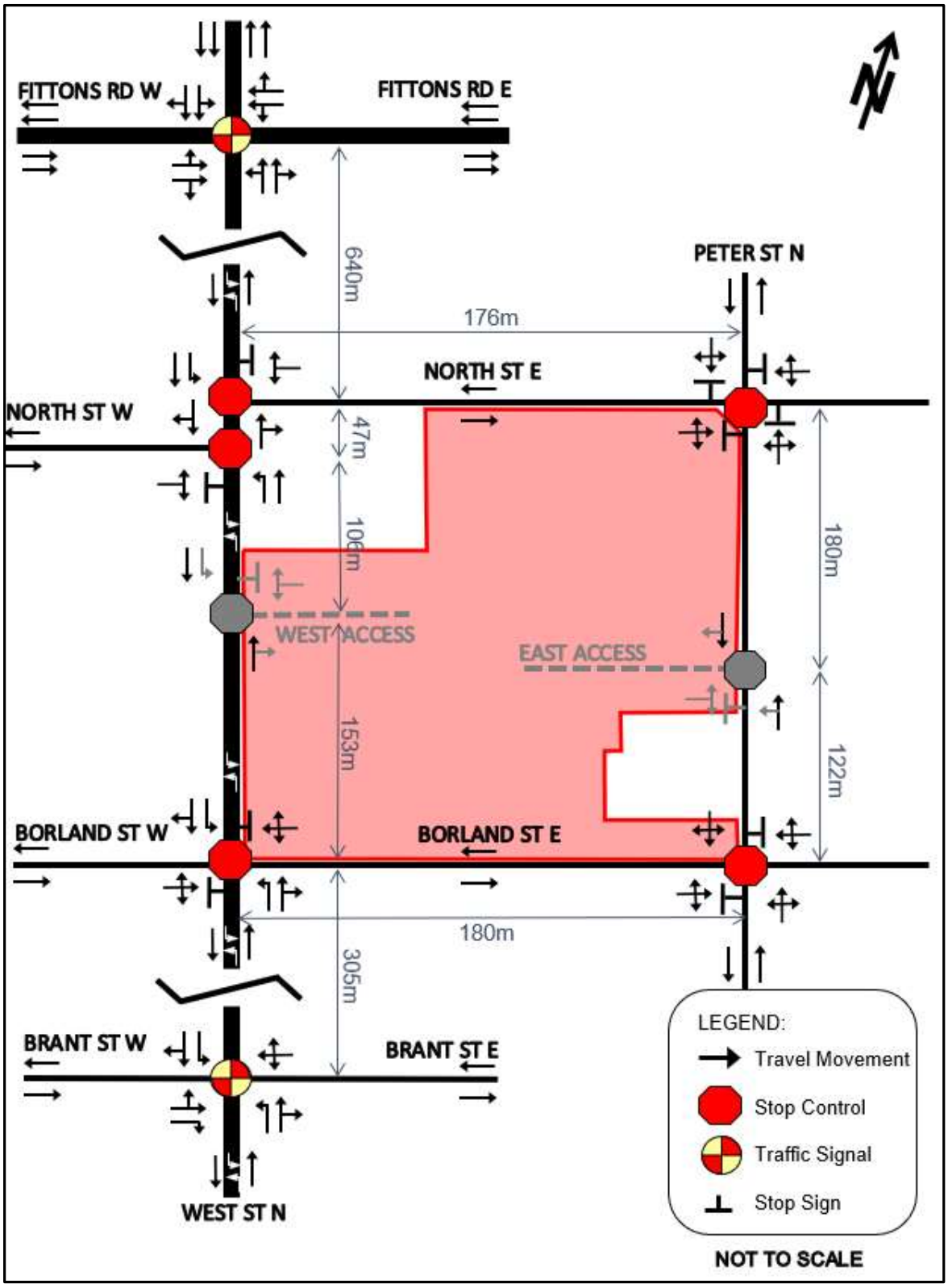
Brant Street is a two-lane collector road with an urban cross-section within the study area. West of West Street North, sidewalk is available on the south side of the road. East of West Street North, sidewalk is available on both sides of the road. Brant Street has a posted speed limit of 40km/h (school zone) and is under the jurisdiction of the City.

Peter Street is a two-lane local road with a semi-urban cross-section (grassed shoulders, open ditches) and sidewalk on the east side of the road between Borland Street and North Street. South of Borland Street and north of North Street, sidewalk is available on both side of the road. Peter Street has a posted speed limit of 50km/h and is under the jurisdiction of the City.

Borland Street is a two-lane local road with an urban cross-section and sidewalk on the north side of the road within the study area. Borland Street has a posted speed limit of 50km/h and is under the jurisdiction of the City.

The existing intersection spacing and lane configuration within the study area is illustrated in **Figure 2**.

Figure 2 – Existing Lane Configuration within Study Area



2.2 Transit Access

Orillia Transit provides one bus route within the study area. The North route provides service on West Street and Fittons Road west of West Street within the study area.

The north route operates between 06:15 – 22:15 on weekdays, 8:45 – 19:45 on Saturdays and 8:45 – 16:45 on Sundays with service generally every 30 minutes. The closest bus stop is located immediately adjacent the subject site on West Street North.

2.3 Local Road Improvements

Based on a review of the City's 2019 Multi-Modal Transportation Master Plan [City MMTMP] and the City's 2020 Capital Budget, there are no significant infrastructure improvements anticipated to be completed within the study area.

2.4 Other Developments within the Study Area

Through correspondence with City staff and in review of the City's Development Status Map (August 2020), the 12 Fittons Road East development has been identified for considerations with respect to impacts on the local traffic volumes / infrastructure capacity.

2.4.1 12 Fittons Road East

The 12 Fittons Road East located on the north side of Fitton Road East, east of West Street in the City. The proposed development will include 43 residential townhouse units with one full-movement access driveway onto Fittons Road East. Trip generation and distribution for the development have been established based on the *12 Fittons Road East* (*JD Northcote Engineering Inc.*, December 6, 2018), excerpts of which are provided in **Appendix B**. The AM and PM peak hour traffic volumes are illustrated in **Figure 4**. Build-out of the 12 Fittons Road East has been assumed by 2022.

2.5 Background Traffic Growth

2.5.1 Population

The 2016 census profile for the City of Orillia indicates that the population has increased from 30,546 in 2011 to 31,128 in 2016, translating to an average annual increase of 0.38%.

The City's MMTMP notes a projected population and employment growth of 2% per year until 2036.

2.5.2 Other Studies

The *12 Fittons Road East JD Northcote Engineering Inc.*) utilized a growth rate of 1.0% per year for the West Street North and Fittons Road roadways.

2.5.3 Overall Background Growth Rate

Through correspondence with City staff, a 1% per annum growth rate was noted as a typical forecasting rate for City roads. In consideration of the historic population growth and growth projections utilized for other transportation reports in the area, a conservative background growth rate of 1.5% per annum has been applied to the study area roadways.

2.6 Traffic Counts

Detailed turning movement traffic and pedestrian counts were obtained from the City and commissioned by JD Engineering at the study intersections. **Table 1** summarizes the traffic count data collection information.

Table 1 – Traffic Count Data

Intersection (N-S Street / E-W Street)	Count Date	AM Peak Hour	PM Peak Hour	Source
West Street N / Fittons Road	Tuesday June 14, 2016	09:00 – 10:00	15:00 – 16:00	City
West Street N / Brant Street	Thursday July 7, 2016	09:00 – 10:00	16:15 – 17:15	City
West Street N / Borland Street	Thursday October 15, 2020	08:00 – 09:00	16:00 – 17:00	JD Eng.
West Street N / North Street E & W	Thursday October 15, 2020	08:00 – 09:00	16:15 – 17:15	JD Eng.
Peter Street N / North Street	Thursday October 15, 2020	08:00 – 09:00	16:15 – 17:15	JD Eng.
Peter Street N / Borland Street	Thursday October 15, 2020	08:00 – 09:00	16:15 – 17:15	JD Eng.

Detailed traffic count data can be found in **Appendix B**. Heavy vehicle percentages from the traffic count data have also been included in the Synchro analysis.

Recognizing that the timing of the study coincides with the physical distancing requirements related to the COVID-19 pandemic, historical turning movement counts and available AADT volumes (prior to the COVID pandemic) were compared to those conducted in October of 2020, in order to consider any traffic volume adjustments necessary in developing typical roadway conditions.

The following factors were considered in converting the historical AADT volumes to existing year peak hour volumes:

- Forecasted growth rate – 1.5% per annum;
- Daily volume to peak hour volume estimate – 8%.

In review of the above, it was found that the observed volumes throughout the study area were found to be below the adjusted AADT volumes, most notably during the AM peak hour. Regardless, in order to account for the discrepancies, a conservative increase of 75% and 50% has been applied to all counts conducted in October of 2020, for the AM and PM peak hours respectively.

2.7 Existing Traffic Volumes

The 2020 existing AM and PM peak hour traffic volumes in the study area are illustrated in **Figure 5**, established based on the conducted and obtained counts, adjusted to reflect the annual background growth rate of 1.5% in addition to the effects of the COVID-19 pandemic as outlined in Section 2.6.

2.8 Horizon Year Traffic Volumes

The background (2022 and 2032) horizon year traffic volumes are illustrated in **Figure 6** and **Figure 7**. The background volumes are based on the August 2020 counts, adjusted to reflect the annual

background growth rate of 1.5% in addition to the aforementioned COVID-19 pandemic adjustment as outlined in Section 2.6.

3 Intersection Operation without Proposed Development

3.1 Introduction

Existing and background horizon operational conditions were established to determine how the street network within the study area is currently functioning without the proposed development. This provides a base case scenario to compare with future development scenarios. Traffic operations within the study area were evaluated using the existing and future background traffic volumes with the existing road configuration and traffic control. The intersection performance was measured using the traffic analysis software, Synchro 10, a deterministic model that employs Highway Capacity Manual and Intersection Capacity Utilization methodologies for analyzing intersection operations. These procedures are accepted by provincial and municipal agencies throughout North America.

Synchro 10 enables the study area to be graphically defined in terms of streets and intersections, along with their geometric and traffic control characteristics. The user is able to evaluate both signalized and unsignalized intersections in relation to each other, thus not only providing level of service for the individual intersections, but also enabling an assessment of the impact the various intersections in a network have on each other in terms of spacing, traffic congestion, delay, and queuing.

Individual turning movements with a volume-to-capacity [V/C] ratio of 0.85 or greater are considered to be critical movements and have been highlighted in the LOS tables.

The intersection operations were also evaluated in terms of the LOS. LOS is a common measure of the quality of performance at an intersection and is defined in terms of vehicular delay. This delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS is expressed on a scale of A through F, where LOS A represents very little delay (i.e. less than 10 seconds per vehicle) and LOS F represents very high delay (i.e. greater than 50 seconds per vehicle for a stop sign controlled intersection and greater than 80 seconds per vehicle for a signalized intersection).

The LOS criteria for signalized and stop sign-controlled intersections are shown in **Table 2**. A description of traffic performance characteristics is included for each LOS.

Table 2 – Level of Service Criteria for Intersections

LOS	LOS Description	Control Delay (seconds per vehicle)	
		Signalized Intersections	**Stop Controlled Intersections**
A	Very low delay; most vehicles do not stop (**Excellent**)	less than 10.0	less than 10.0
B	Higher delay; more vehicles stop (**Very Good**)	between 10.0 and 20.0	between 10.0 and 15.0
C	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping **(Good**)	between 20.0 and 35.0	between 15.0 and 25.0
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop (**Satisfactory**)	between 35.0 and 55.0	between 25.0 and 35.0
E	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of **acceptable** delay	between 55.0 and 80.0	between 35.0 and 50.0
F	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection (**Unacceptable**)	greater than 80.0	greater than 50.0

3.2 Existing Intersection Operation

The results of the LOS analysis under existing (2020) traffic volumes during the AM and PM peak hour can be found below in **Table 3**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix C**.

Table 3 – Existing (2020) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour			Weekday PM Peak Hour		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
West Street N / Borland Street (unsignalized)	-	1.7	A	-	1.4	A
EB	0.21	19.0	C	0.11	16.9	C
WB	0.14	16.7	C	0.14	17.7	C
NBL	0.03	9.8	A	0.03	8.7	A
NBTR	0.34	0.0	-	0.41	0.0	-
SBL	0.03	8.9	A	0.04	9.3	A
SBTR	0.47	0.0	-	0.33	0.0	-
Peter Street N / Borland Street (unsignalized)	-	2.8	A	-	2.9	A
EB	0.12	12.8	B	0.11	1.5	B
WB	0.11	13.2	B	0.07	12.0	B
NB	0.00	0.3	A	0.01	0.5	A
SB	0.00	0.1	A	0.00	0.2	A
Peter Street N / North Street E (unsignalized)	-	10.1	A	-	9.7	A
EB	0.10	8.8	A	0.18	9.2	A
WB	0.31	10.6	B	0.29	10.0	B
NB	0.25	9.6	A	0.29	9.9	A
SB	0.34	10.5	B	0.18	9.2	A
West Street N / North St E (unsignalized)	-	2.0	A	-	1.8	A
WB	0.37	18.9	C	0.33	18.8	C
NBTR	0.37	0.0	-	0.45	0.0	-
SBL	0.03	9.0	A	0.03	9.5	A
SB	0.42	0.0	-	0.33	0.0	-
West Street N / North St W (unsignalized)	-	1.8	A	-	1.3	A
EB	0.33	19.4	C	0.25	18.4	C
NBL	0.03	9.7	A	0.02	8.9	A
NBTR	0.34	0.0	-	0.41	0.0	-
NB	0.45	0.0	-	0.36	0.0	-
West Street N / Brant Street (signalized)	0.30	9.2	A	0.40	10.9	B
EBTL	0.46	30.2	C	0.62	33.1	C
EBR	0.04	26.9	C	0.02	25.9	C
WB	0.28	28.3	C	0.37	28.2	C
SBL	0.02	2.9	A	0.06	3.8	A
SBTR	0.25	3.9	A	0.34	5.3	A
NBL	0.01	2.9	A	0.03	3.6	A
NBTR	0.28	4.0	A	0.35	5.3	A
West Street N / Fittons Road (signalized)	0.47	16.3	B	0.58	19.1	B
EB	0.50	26.5	C	0.65	28.5	C
WB	0.69	30.4	C	0.77	32.4	C
NB	0.27	6.6	A	0.30	8.8	A
SB	0.38	6.9	A	0.47	9.6	A

The results of the LOS analysis indicate that all intersections are operating within the typical design limits noted in Section 3.1.

A review of the need for auxiliary right and left turn lanes at unsignalized study area intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, auxiliary turn lanes are not recommended at any unsignalized study area intersections.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area intersections (results are provided in **Appendix F**).

No additional improvements are recommended within the study area.

3.3 Background (2022) Intersection Operation

The results of the LOS analysis under background (2022) traffic volumes during the AM and PM peak hour can be found below in **Table 4**. Detailed output of the Synchro analysis can be found in **Appendix D**.

The results of the LOS analysis indicate that the study area intersections are operating within the typical design limits noted in Section 3.1.

A review of the need for auxiliary right and left turn lanes at unsignalized study area intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, auxiliary turn lanes are not recommended at any unsignalized study area intersections.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area intersections (results are provided in **Appendix F**).

No infrastructure improvements are recommended within the study area to accommodate the background (2022) traffic volumes.

Table 4 – Background (2022) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour			Weekday PM Peak Hour		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
West Street N / Borland Street (unsignalized)	-	1.7	A	-	1.4	A
EB	0.22	19.6	C	0.11	17.4	C
WB	0.14	17.2	C	0.14	18.3	C
NBL	0.03	9.9	A	0.03	8.8	A
NBTR	0.35	0.0	-	0.43	0.0	-
SBL	0.03	9.0	A	0.04	9.4	A
SBTR	0.48	0.0	-	0.34	0.0	-
Peter Street N / Borland Street (unsignalized)	-	2.8	A	-	2.9	A
EB	0.13	13.0	B	0.12	11.6	B
WB	0.12	13.4	B	0.07	12.2	B
NB	0.00	0.3	A	0.01	0.5	A
SB	0.00	0.1	A	0.00	0.2	A
Peter Street N / North Street E (unsignalized)	-	10.3	A	-	9.8	A
EB	0.11	8.9	A	0.18	9.3	A
WB	0.32	10.8	B	0.31	10.2	B
NB	0.26	9.7	A	0.31	10.0	B
SB	0.35	10.7	B	0.19	9.3	A
West Street N / North St E (unsignalized)	-	2.1	A	-	1.8	A
WB	0.39	20.1	C	0.35	19.8	C
NBTR	0.38	0.0	-	0.47	0.0	-
SBL	0.03	9.0	A	0.04	9.6	A
SB	0.43	0.0	-	0.35	0.0	-
West Street N / North St W (unsignalized)	-	1.9	A	-	1.3	A
EB	0.36	20.4	C	0.27	19.2	C
NBL	0.03	9.8	A	0.02	8.9	A
NBTR	0.35	0.0	-	0.43	0.0	-
SB	0.47	0.0	-	0.38	0.0	-
West Street N / Brant Street (signalized)	0.32	9.2	A	0.41	11.0	B
EBTL	0.47	30.2	C	0.63	33.3	C
EBR	0.04	26.7	C	0.02	25.7	C
WB	0.28	27.5	C	0.37	28.0	C
SBL	0.02	2.9	A	0.06	3.9	A
SBTR	0.26	3.5	A	0.36	5.5	A
NBL	0.01	2.9	A	0.03	3.7	A
NBTR	0.29	3.6	A	0.36	5.5	A
West Street N / Fittons Road (signalized)	0.50	16.9	B	0.61	19.8	B
EB	0.49	26.0	C	0.66	28.8	C
WB	0.71	30.9	C	0.80	33.4	C
NB	0.29	7.4	A	0.33	9.5	A
SB	0.41	7.8	A	0.50	10.5	B

3.4 Background (2032) Intersection Operation

The results of the LOS analysis under background (2032) traffic volumes during the AM and PM peak hour can be found below in **Table 5**. Detailed output of the Synchro analysis can be found in **Appendix D**.

Table 5 – Background (2032) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour			Weekday PM Peak Hour		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
West Street N / Borland Street (unsignalized)	-	2.1	A	-	1.7	A
EB	0.32	25.3	D	0.17	20.9	C
WB	0.21	21.2	C	0.21	22.3	C
NBL	0.04	10.6	B	0.04	9.2	A
NBTR	0.41	0.0	-	0.50	0.0	-
SBL	0.03	0.8	A	0.05	10.0	A
SBTR	0.56	0.0	-	0.40	0.0	-
Peter Street N / Borland Street (unsignalized)	-	3.1	A	-	3.1	A
EB	0.16	14.1	B	0.14	12.3	B
WB	0.15	14.6	B	0.09	13.0	B
NB	0.01	0.3	A	0.01	0.6	A
SB	0.00	0.1	A	0.00	0.2	A
Peter Street N / North Street E (unsignalized)	-	11.6	A	-	10.9	A
EB	0.13	9.5	A	0.23	10.1	B
WB	0.39	12.2	B	0.38	11.5	B
NB	0.32	10.8	B	0.38	11.3	B
SB	0.43	12.2		0.23	10.2	B
West Street N / North St E (unsignalized)	-	2.7	A	-	2.4	B
WB	0.52	26.6	D	0.48	26.3	D
NBTR	0.44	0.0	-	0.55	0.0	-
SBL	0.04	9.5	A	0.05	10.2	B
SB	0.51	0.0	-	0.40	0.0	-
West Street N / North St W (unsignalized)	-	2.4	B	-	1.6	A
EB	0.49	27.2	D	0.37	23.9	C
NBL	0.04	10.5	B	0.03	9.3	A
NBTR	0.41	0.0	-	0.50	0.0	-
SB	0.54	0.0	-	0.44	0.0	-
West Street N / Brant Street (signalized)	0.37	9.6	A	0.48	11.7	B
EBTL	0.51	30.8	C	0.59	29.2	C
EBR	0.05	26.7	C	0.03	23.5	C
WB	0.32	28.4	C	0.36	25.7	C
SBL	0.03	3.1	A	0.08	5.0	A
SBTR	0.31	4.4	A	0.44	7.3	A
NBL	0.02	3.0	A	0.04	4.7	A
NBTR	0.34	4.6	A	0.45	7.4	A
West Street N / Fittons Road (signalized)	0.62	18.8	B	0.75	23.6	C
EB	0.53	25.7	C	0.74	30.7	C
WB	0.79	33.3	C	0.88	39.1	D
NB	0.37	9.6	A	0.43	12.2	B
SB	0.52	10.3	B	0.64	14.4	B

The results of the LOS analysis indicate that the study area intersections are operating within the typical design limits noted in Section 3.1.

A review of the need for auxiliary right and left turn lanes at unsignalized study area intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, auxiliary turn lanes are not recommended at any unsignalized study area intersections.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area intersections (results are provided in **Appendix F**).

No infrastructure improvements are recommended within the study area to accommodate the background (2032) traffic volumes.

4 Proposed Development

4.1 Traffic Generation

The traffic generation for proposed development has been estimated based the type of land use, development size and data provided in the Institute of Transportation Engineers [ITE] *Trip generation Manual* (10th Edition) [ITE Trip Generation Manual]. The following ITE land use has been applied to estimate the traffic for the proposed development:

- ITE land use 221 (Multifamily Housing (Mid-Rise)) – General Urban/Suburban Setting;
- ITE land use 565 (Day Care Centre) - General Urban/Suburban Setting; and
- ITE land use 710 (General Office Building) – General Urban/Suburban Setting.

It is noted that the ITE Trip Generation Manual provides a land use code for Affordable Housing (ITE code 223) but cautions the utilization of such code due to its limited sample size (2 studies). As such, the Multifamily Housing code was utilized to provide a robust and conservative statistical estimate of the generated traffic.

In review of the anticipated agency uses listed for the leasable areas within the proposed development, it has been determined that the majority of the uses (aside from the licensed child care centre) will have a traffic generation rate similar to that of an office building. As such, the total leasable area (less the child care centre GFA) has been assumed as ITE land use 710 (General Office Building).

For trip rates showing a strong statistical relationship, fitted curve equations have been utilized. The traffic rates and equations are summarized in **Table 6**.

Table 6 – ITE Traffic Generation Trip Rates & Fitted Curve Equations

Land Use	Trip Basis	AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Multifamily Housing (Mid-Rise) ITE Land Use: 221	rate (units)	0.09	0.27	0.36	0.27	0.17	0.44
Day Care Centre ITE Land Use: 565	rate (1000 ft^2 GFA)	5.83	5.17	11.0	5.23	5.89	11.1
General Office Building ITE Land Use: 710	equation (1000 ft^2 GFA)	T = 0.94 X + 26.49			Ln(T) = 0.95 Ln(X) + 0.36		
	distribution	86%	14%	100%	16%	84%	100%

The estimated trip generation for the proposed development is illustrated below in **Table 7.**

Table 7 – Estimated Traffic Generation of Proposed Development

Land Use	Size	AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Multifamily Housing (Mid-Rise) ITE Land Use: 221	130 units	12	35	47	35	22	57
Day Care Centre ITE Land Use: 565	3,262 ft^2 GFA	19	17	36	17	19	36
General Office Building ITE Land Use: 710	39,371 ft^2 GFA	55	9	63	8	39	47
Total		**86**	**61**	**147**	**60**	**81**	**141**

As shown, the proposed residential development is expected to generate 147 trips and 141 trips during the AM and PM peak hours, respectively.

4.2 Traffic Assignment

For the purposes of this study, it has been assumed that all traffic generated by the proposed development will be new traffic and would not be in the study area if the development was not constructed.

The ITE data provides the anticipated percentage of new traffic entering and exiting during the peak hour. The distribution of traffic has been calculated based on the 2016 Transportation Tomorrow Survey [TTS] data for traffic zone 8682 retrieved using the TTS Internet Data Retrieval System [IDRS] (output attached as **Appendix F**). TTS data provides historical origin and destination work trip percentages for specific areas within the County and the Greater Toronto and Hamilton Area [GTHA].

Traffic distribution for the trips generated by the development land uses are expected to generally follow commuter travel patterns. Our analysis is based on egress traffic during the AM peak hour. Logically, the distribution of ingress traffic will follow the inverse of the exiting traffic distribution. For each of the individual areas identified in the TTS data, we have selected the probable route of travel, assuming that people will select their route primarily based on travel time.

The distribution of residential trips is illustrated in **Table 8** using the methodology outlined above.

Table 8 – Proposed Development Traffic Distribution Summary

Travel Direction (to/from)	Percent of Total Traffic Generation
North	23%
South	54%
East	17%
West	6%
Total	**100%**

Further distribution to the study area intersections and Site Access points has been based on the overall distribution in conjunction with the motorists' anticipated travel route.

Figure 8 illustrates the traffic assignment for the proposed development.

4.3 Total Horizon Year Traffic Volumes with the Proposed Development

For the total (2022 and 2032) horizon year traffic volumes, the proposed development traffic was added to the background (2022 and 2032) traffic volumes. The resulting total (2022 and 2032) horizon year traffic volume for the AM and PM peak hour are illustrated in **Figure 9** and **Figure 10**.

5 Intersection Operation with Proposed Development

5.1 Total (2022) Intersection Operation

The results of the LOS analysis under total (2022) traffic volumes during the AM and PM peak hour can be found below in **Table 9**. Stop control has been assumed at the Site Access egress movements. Detailed output of the Synchro analysis can be found in **Appendix E**.

Table 9 – Total (2022) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour			Weekday PM Peak Hour		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
West Street N / Borland Street (unsignalized)	-	1.7	A	-	1.4	A
EB	0.24	20.8	C	0.12	18.1	C
WB	0.1	18.1	C	0.15	19.0	C
NBL	0.03	10.1	B	0.03	8.9	A
NBTR	0.38	0.0	-	0.45	0.0	-
SBL	0.03	9.1	A	0.04	9.0	A
SBTR	0.50	0.0	-	0.36	0.0	-
Peter Street N / Borland Street (unsignalized)	-	3.1	A	-	3.0	A
EB	0.13	13.5	B	0.12	12.0	B
WB	0.14	13.4	B	0.08	12.2	B
NB	0.00	0.3	A	0.01	0.5	A
SB	0.01	0.3	A	0.01	0.6	A
Peter Street N / North Street E (unsignalized)	-	10.6	A	-	10.0	A
EB	0.11	9.0	A	0.19	9.4	A
WB	0.34	11.2	B	0.32	10.5	B
NB	0.28	10.0	B	0.33	10.3	B
SB	0.36	10.9	B	0.19	9.4	A
West Street N / North St E (unsignalized)	-	2.2	A	-	2.0	A
WB	0.42	20.9	C	0.37	20.6	C
NBTR	0.39	0.0	-	0.48	0.0	-
SBL	0.04	9.1	A	0.04	9.7	A
SB	0.45	0.0	-	0.35	0.0	-
West Street N / North St W (unsignalized)	-	2.1	A	-	1.4	A
EB	0.39	21.3	C	0.29	19.8	C
NBL	0.04	9.9	A	0.03	9.0	A
NBTR	0.36	0.0	-	0.44	0.0	-
SDB	0.47	0.0	-	0.38	0.0	-
West Street N / Brant Street (signalized)	0.34	9.0	A	0.44	10.9	B
EBTL	0.47	30.2	C	0.63	33.3	C
EBR	0.04	26.8	C	0.02	25.7	C
WB	0.28	28.3	C	0.37	28.0	C
SBL	0.02	3.0	A	0.06	3.9	A
SBTR	0.30	4.2	A	0.38	5.7	A
NBL	0.01	2.9	A	0.03	3.7	A
NBTR	0.31	4.3	A	0.40	5.8	A
West Street N / Fittons Road (signalized)	0.52	19.7	B	0.63	19.8	B
EB	0.49	26.0	C	0.66	28.8	C
WB	0.71	30.9	C	0.80	33.4	C
NB	0.30	7.4	A	0.34	9.6	A
SB	0.42	7.9	A	0.52	10.7	B
West Street N / West Access (unsignalized)	-	0.6	A	-	0.8	A
WB	0.11	14.7	B	0.15	16.1	C
West Street N / East Access (unsignalized)	-	0.9	A	-	1.1	A
EB	0.03	10.3	B	0.04	9.7	A

The results of the LOS analysis indicate that all intersections are operating within the typical design limits noted in Section 3.1.

It is noted that the study area intersections will operate at near identical levels to those experienced under background conditions, indicating that the proposed development will have minimal impact on the study area. In this regard, it is evident that the study area intersections can support the proposed development volumes with no adverse effects.

No additional improvements are recommended within the study area.

5.2 Total (2032) Intersection Operation

The results of the LOS analysis under total (2032) traffic volumes during the AM and PM peak hour can be found below in **Table 10**. Stop control has been assumed at the Site Access egress movements. Detailed output of the Synchro analysis can be found in **Appendix E**.

The results of the LOS analysis indicate that all intersections are operating within the typical design limits noted in Section 3.1.

Again, study area intersections will operate at near identical levels to those experienced under background conditions. The proposed development will have minimal impact on the study area.

No additional improvements are recommended within the study area.

Table 10 – Total (2032) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour			Weekday PM Peak Hour		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
West Street N / Borland Street (unsignalized)	-	2.2	A	-	1.7	B
EB	0.34	26.8	D	0.17	21.8	C
WB	0.22	22.5	C	0.22	23.4	C
NBL	0.04	10.7	B	0.04	9.3	A
NBTR	0.43	0.0	-	0.51	0.0	-
SBL	0.04	9.5	A	0.06	10.1	B
SBTR	0.58	0.0	-	0.42	0.0	-
Peter Street N / Borland Street (unsignalized)	-	3.3	A	-	3.2	A
EB	0.17	14.8	B	0.15	12.8	B
WB	0.17	14.7	B	0.10	13.2	B
NB	0.01	0.3	A	0.01	0.6	A
SB	0.01	0.3	A	0.01	0.5	A
Peter Street N / North Street E (unsignalized)	-	11.9	B	-	11.3	B
EB	0.14	9.6	A	0.24	10.2	B
WB	0.42	12.7	B	0.40	11.9	B
NB	0.35	11.1	B	0.41	11.7	B
SB	0.44	12.5	B	0.24	10.3	B
West Street N / North St E (unsignalized)	-	2.9	A	-	2.6	B
WB	0.55	28.3	D	0.50	27.7	D
NBTR	0.45	0.0	-	0.56	0.0	-
SBL	0.04	9.5	A	0.05	10.3	B
SB	0.52	0.0	-	0.41	0.0	-
West Street N / North St W (unsignalized)	-	2.5	B	-	1.8	A
EB	0.50	28.4	D	0.39	24.9	C
NBL	0.05	10.6	B	0.04	9.4	A
NBTR	0.42	0.0	-	0.51	0.0	-
SDB	0.56	0.0	-	0.44	0.0	-
West Street N / Brant Street (signalized)	0.38	9.4	A	0.50	11.7	B
EBTL	0.51	30.8	C	0.59	29.2	C
EBR	0.05	26.7	C	0.03	23.5	C
WB	0.32	28.4	C	0.36	25.7	C
SBL	0.03	3.1	A	0.09	5.0	A
SBTR	0.34	4.6	A	0.47	7.6	A
NBL	0.02	3.0	A	0.05	4.7	A
NBTR	0.36	4.8	A	0.48	7.8	A
West Street N / Fittons Road (signalized)	0.63	18.7	B	0.76	23.6	C
EB	0.53	25.7	C	0.74	30.7	C
WB	0.79	33.3	C	0.88	39.1	D
NB	0.38	9.7	A	0.45	12.5	B
SB	0.54	10.5	B	0.66	14.8	B
West Street N / West Access (unsignalized)	-	0.6	A	-	0.7	A
WB	0.12	16.2	C	0.18	18.2	C
West Street N / East Access (unsignalized)	-	0.8	A	-	1.0	A
EB	0.03	10.6	B	0.04	10.0	A

5.3 Pedestrian Crossing Operations

Pedestrian signals are currently available on West Street North, adjacent the subject site, approximately 137 metres north of Borland Street. This infrastructure was originally installed to service the Orillia District Collegiate Vocational Institute.

It is noted that the *Ontario Traffic Manual Book 12 Signal Justification – Justification 6* utilizes a pedestrian crossing demand threshold of 100 "equivalent adult pedestrians" in determining the need for pedestrian traffic signals. In context with the existing and anticipated pedestrian volumes in the local area, pedestrian signals would not exceed the above-noted warrant threshold. Nevertheless, the provision of the pedestrian signals will provide enhanced pedestrian crossing infrastructure for existing and proposed pedestrian movements.

No adverse effects to traffic operations on West Street North are anticipated as a result of the pedestrian signals remaining in use. Consequently, it is recommended that the pedestrian traffic signals remain.

5.4 Site Access

The Site Access driveways will operate efficiently as a full-movement driveway, with one-way stop control for the egress movements. Single ingress and egress lane will provide the necessary capacity to service the proposed development.

The proposed spacing between the West Access and North Street to the north and Borland Street to the south (measured edge of driveway to edge of road) meets the minimum driveway spacing requirements for an arterial road as per the TAC Guidelines – Figure 8.8.2 (Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections) – 35 metres for unsignalized condition.

The proposed spacing between the East Access and North Street to the north and Borland Street to the south meets the minimum driveway spacing requirements for a local road as per the TAC Guidelines – Figure 8.8.2 (Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections) – 55 metres for unsignalized condition.

As per TAC Guidelines Section 8.9.9, for low volume roads such as locals and collectors, the spacing between driveways on opposite sides of the road is not a necessary design consideration and typically, does not impact traffic operations at the driveways themselves. Nevertheless, the proposed spacing between the East Access and the existing YMCA of Orillia south parking lot entrance (approximately 12 metres between centerlines) is considered sufficient to accommodate opposing left turn movements and any inter-development traffic flow that may occur.

5.5 Sight Distance Review

A review of the available sight distances for the proposed West Access and East Access was completed as part of this analysis.

The sight distance north and south on West Street North at the West Access (approximately 155 metres and 200+ metres, respectively) is greater than the minimum sight distance requirements as per the TAC Guidelines for a design speed of 60 km/h (85 metres).

The sight distance north and south on Peter Street North at the East Access (200+ metres and approximately 93 metres, respectively) is greater than the minimum sight distance requirements as per the TAC Guidelines for a design speed of 60 km/h (85 metres).

There are no issues with the sight distance available for the proposed Site Access.

6 Parking Analysis

6.1 Scope

The purpose of this analysis is to estimate the minimum parking supply required to adequately service the subject site. The proposed Site Plan includes a total parking supply of 262 spaces, including 9 barrier-free parking spaces.

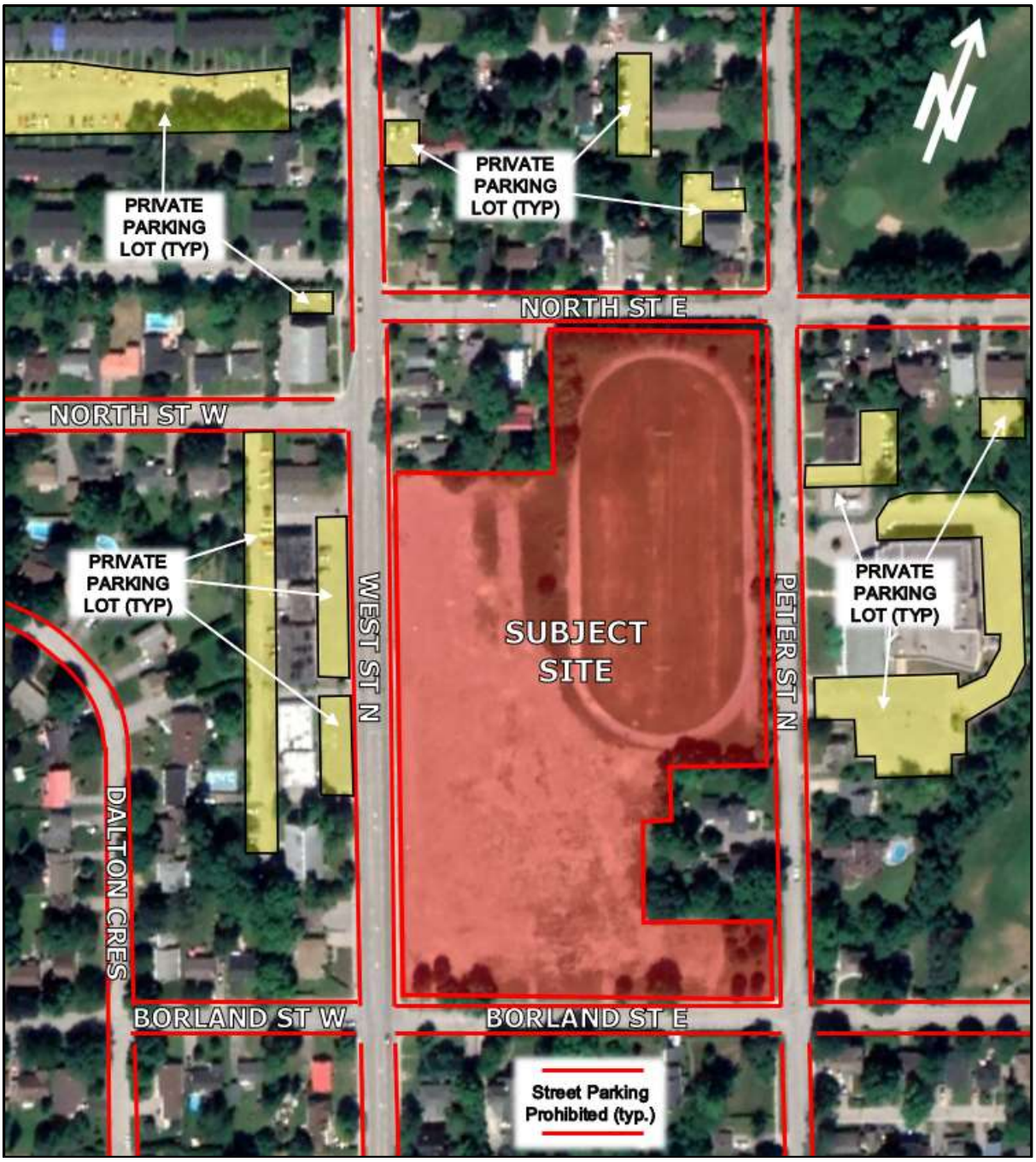
6.2 Study Area Parking Infrastructure

On-street parking is prohibited on all roads within the study area.

There are various private surface parking lots on West Street North, Peter Street North and North Street East.

Figure 3 illustrates the location of the above-noted existing parking in the study area.

Figure 3 – Existing Local Parking Supply



6.3 City of Orillia By-law

The City of Orillia Zoning By-Law 2014-44 [ZBL] (Office Consolidation January 9, 2020) provides parking requirements for a variety of building types and land uses. **Table 11** summarizes the parking requirement, according to the ZBL, for the proposed development.

Table 11 - Zoning By-law Parking Requirements

Category	Parking Standard	Size	Required	Provided	Net Parking Supply
Residential Building containing more than 3 Dwelling Units	1.5 spaces per unit	130 units	195 spaces	262 spaces	-
Child Care Centre	1.0 space per class (min. of 3)	1 class	3 spaces		
Business, Professional or Administrative Office	1.0 space per 30m^2 GFA	3,427 m^2	114 spaces		
All other uses		293 m^2	10 spaces		
TOTAL PARKING SPACES			**322 spaces**	**262 spaces**	**- 60 spaces**
Barrier-Free Parking	*2 spaces + 2% of Required spaces*		*9 spaces*	*9 paces*	*0 spaces*
Bicycle Parking	*1 space per 10 residential spaces 1 space per 300 m^2 commercial area*		*32 spaces + 13 spaces = 45 spaces*	*28 indoor + 42 outdoor = 70 spaces*	*+ 25 spaces*

As indicated, the proposed parking supply falls below the calculated requirement by 60 spaces. It should be noted that the parking requirement for the residential portion of the site has been calculated based on the typical residential building use, recognizing that the City's ZBL does not provide parking standards for affordable housing units. Further investigation into necessary parking provision for the affordable housing portion of the subject site is provided in the proceeding sections.

6.4 Parking Justification

The following justification is provided in support of the parking supply for the proposed apartment units.

6.4.1 Site Characteristics

A review of the site has been undertaken to consider the various characteristics of the site and local area that may influence the parking generation of the site.

As previously noted, the Orillia Transit north route provides service on West Street and Fittons Road west of West Street within the study area. Currently, a bus stop is located immediately adjacent the subject site on West Street North.

In consideration of the existing access to transit and proximity to local amenities in the immediate area, there is an opportunity for reduced reliance on the private automobile trips for residents of the proposed apartment units. Consequently, a reduced parking supply is justified.

6.4.2 Proxy Parking Data

Resident parking data has been provided by the County for existing sites which include dedicated rent-geared-to-income [RGI] or affordable residential units. Information about the sites is provided in **Table 12** below (raw data from the County of Simcoe is provided in **Appendix I**)[1].

[1] The names and exact locations of the specific buildings have been withheld due to legalities regarding confidentiality of social service recipients.

Table 12 – Proxy Resident Parking Data Details

Building Number	Location	Building Type (Unit Type[2])	Unit Mix	Units	Resident Parking	
					Utilization	Rate
1	Bradford ON	Senior	100% Affordable	25	13	52%
2	Barrie ON	Senior	50% RGI 50% Affordable	107	47	44%
3	Collingwood ON	Apartment (Senior/Family)	17% RGI 83% Affordable	147	75	51%
4	Wasaga Beach ON	Apartment (Family)	100% Affordable	99	55	56%
5	Victoria Harbour ON	Senior	100% Affordable	41	18	44%
Total				**419**	**208**	**50%**

As illustrated in **Table 12**, the resident parking utilization for the five sites provided is 0.5 spaces per unit.

Based on our correspondence with County staff, the parking management / policies at each site vary slightly. Some sites charge a small fee for an extra vehicle and others have no parking restrictions for additional parking. Some sites have designated parking spaces for residents and others have no designated parking.

In all proxy sites provided above, there was an excess parking supply for resident parking. Consequently, the parking utilization at each site was not limited by supply and thus the utilization of resident parking is considered to be a good representation of the resident parking demand rate.

At all of the above-noted proxy survey locations, units were occupied at a typical saturated rate.

6.4.3 Parking Analysis

As previously noted, the proposed development will provide 262 parking spaces. Removing the necessary parking provision for the non-residential uses (127 spaces for the Day Care Centre, Office, etc.), this results in a provision of 135 parking spaces remaining for the 130 affordable housing units, translating to a parking supply 1.04 spaces per unit.

Based on the proxy count data, it is estimated that the parking demand for resident parking spaces for the subject site will be 0.5 parking spaces per unit. As such, the proposed provision of 1.04 spaces per unit is considered sufficient to support the expected parking demand in addition to any variation that may occur.

[2] Family sites have a mix of 1, 2 and 3 bedroom units.

6.4.4 Recommendations

The proposed parking supply (262 spaces including 9 barrier-free parking spaces and 70 bicycle parking spaces) is considered to be adequate for the proposed development.

7 Summary

McKnight Charron Limited Architects retained **JD Engineering** to prepare this traffic impact study in support of the proposed affordable housing development located on the the east side of West Street North between Borland Street West and North Street East in the City of Orillia.

The proposed development includes a 6 storey, 130-unit affordable housing building with approximately 4,055 m^2 (43,653 ft^2) of leasable office/commercial space. It is anticipated that ultimate build-out will occur by 2022.

This chapter summarizes the conclusions and recommendations from the study.

1. The proposed development is expected to generate a total of 147 AM and 141 PM peak hour trips.
2. Detailed intersection counts were obtained and conducted at the study intersections.
3. An intersection operation analysis was completed at the study area intersections, using the existing and background (2022 and 2032) traffic volumes. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed development. No improvements are recommended within the study area.
4. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area roads and intersections.
5. An intersection operation analysis was completed under total (2022 and 2032) traffic volumes with the proposed development operational at the study area intersections. No improvements are recommended within the study area.
6. The proposed site accesses will operate efficiently with one-way stop control for egress movements. A single lane for ingress and egress movements will provide the necessary capacity to convey the traffic volume generated by the proposed development.
7. The sight distance available for the proposed site accesses is suitable for the intended use.
8. The location of the proposed site access connections are considered appropriate with respect to minimum corner clearance and spacing requirements as identified in the Transportation Association of Canada Design Guide for Canadian Roads (2017).
9. The proposed parking supply for the residential units within the subject site is 1.04 parking spaces / unit, which is less that the City's By-Law requirement of 1.5 parking spaces / unit. Based on our parking analysis, the proposed parking supply considered sufficient for the intended use. The proposed 9 barrier-free parking spaces meets the City's By-Law requirement and the proposed 70 bicycle parking spaces exceeds the City's By-Law requirement.
10. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

Figure 4: Background Development Traffic Volumes (12 Fittons Road)

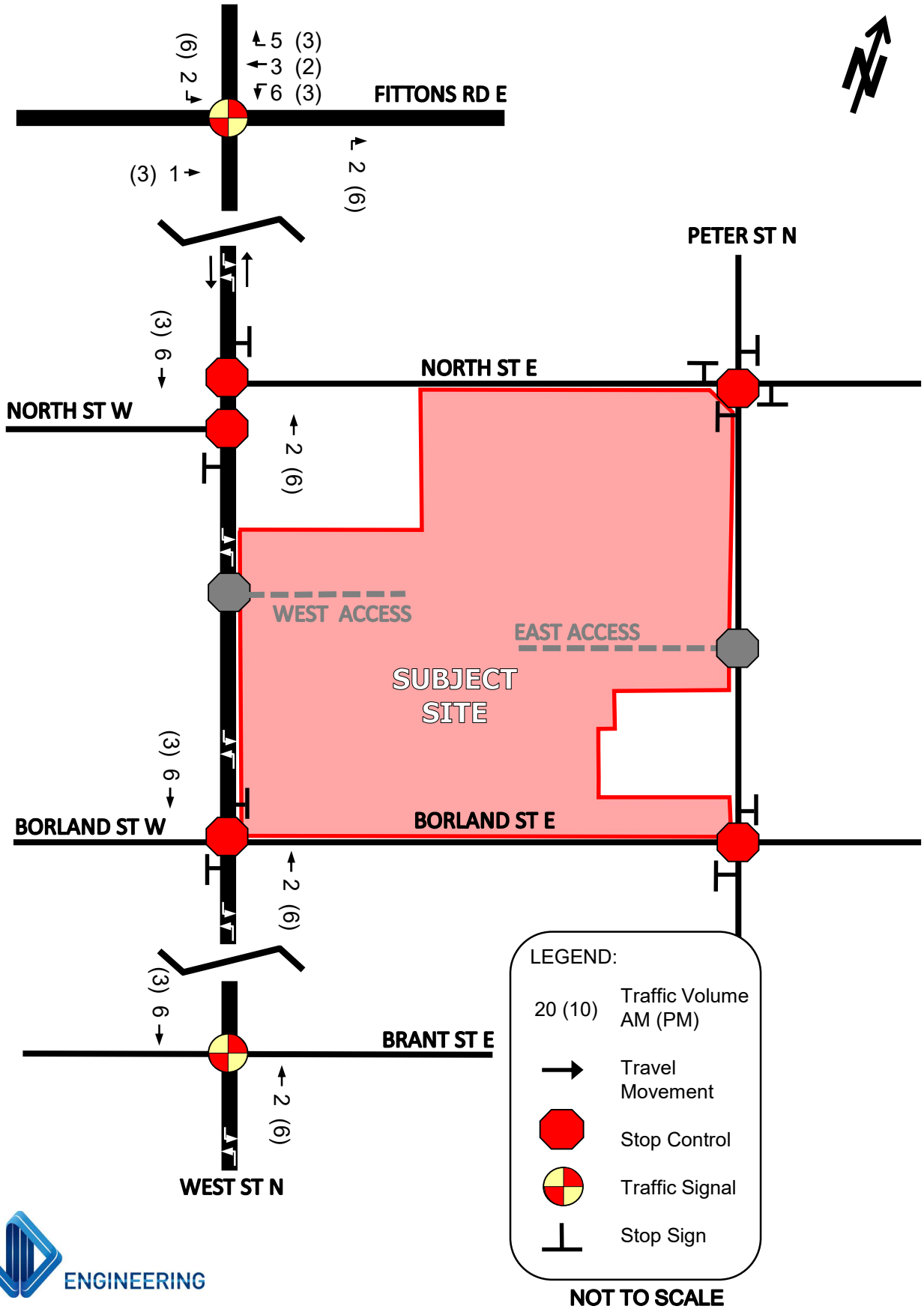


Figure 5: Existing (2020) Traffic Volumes

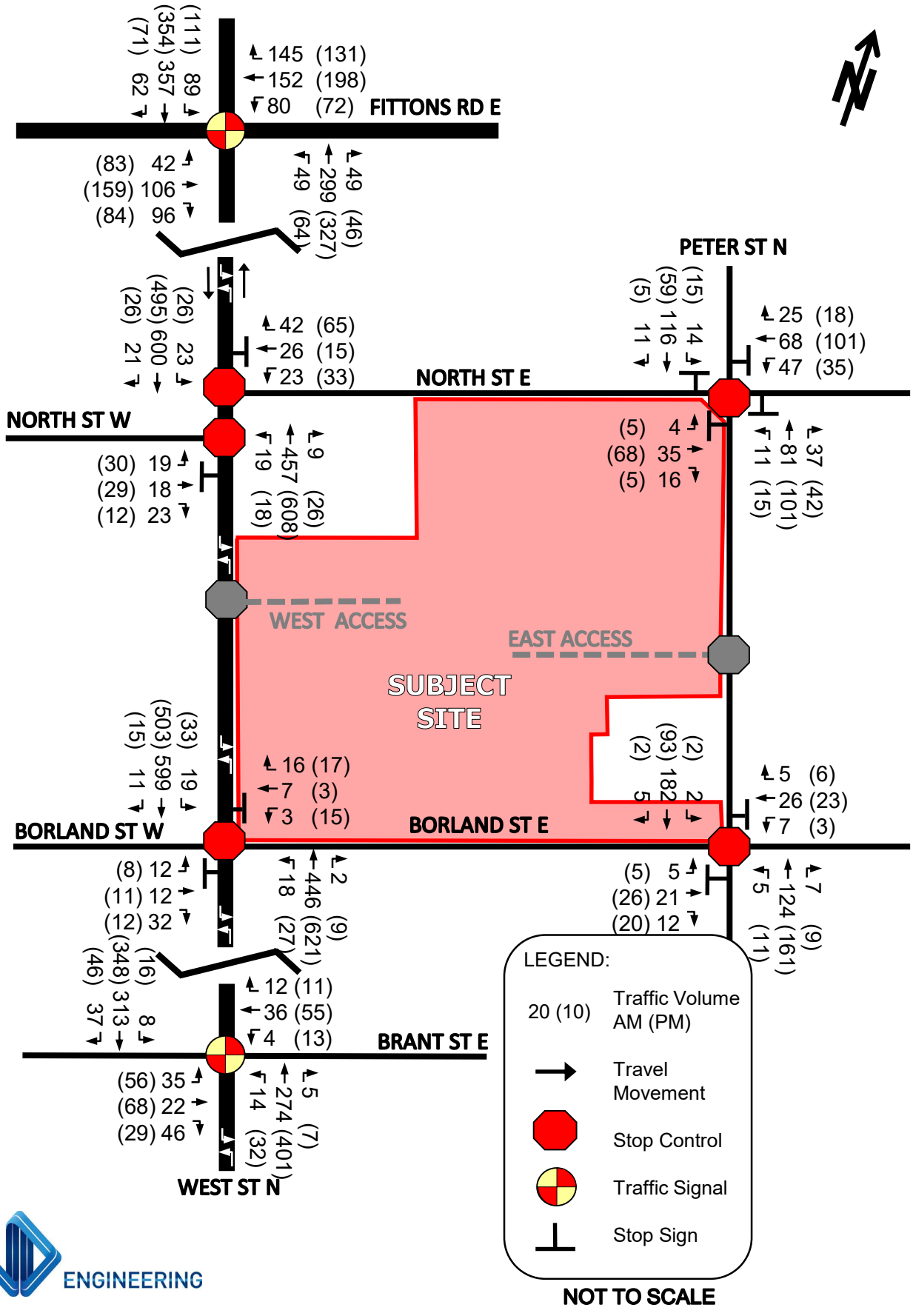


Figure 6: Background (2022) Traffic Volumes

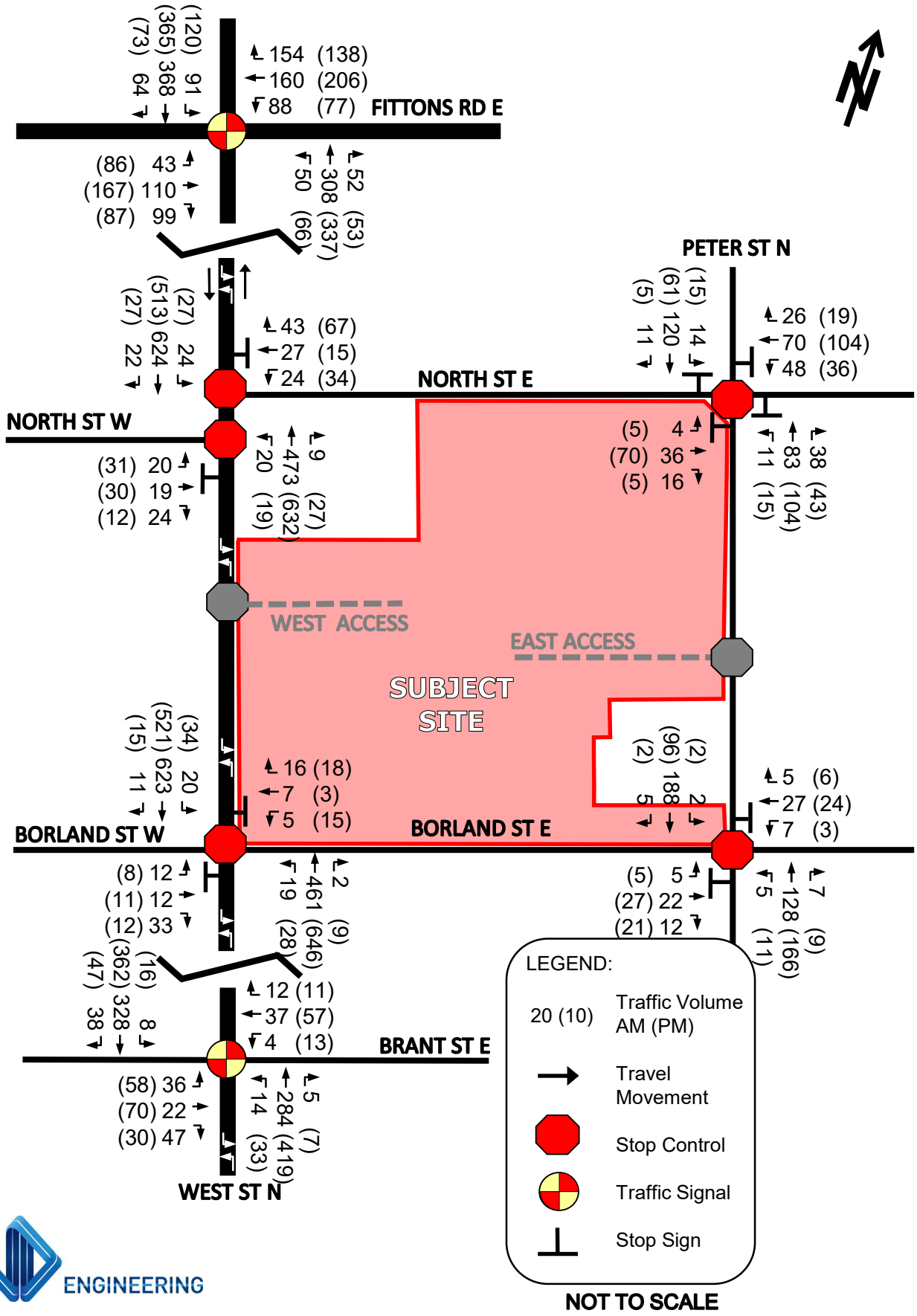


Figure 7: Background (2032) Traffic Volumes

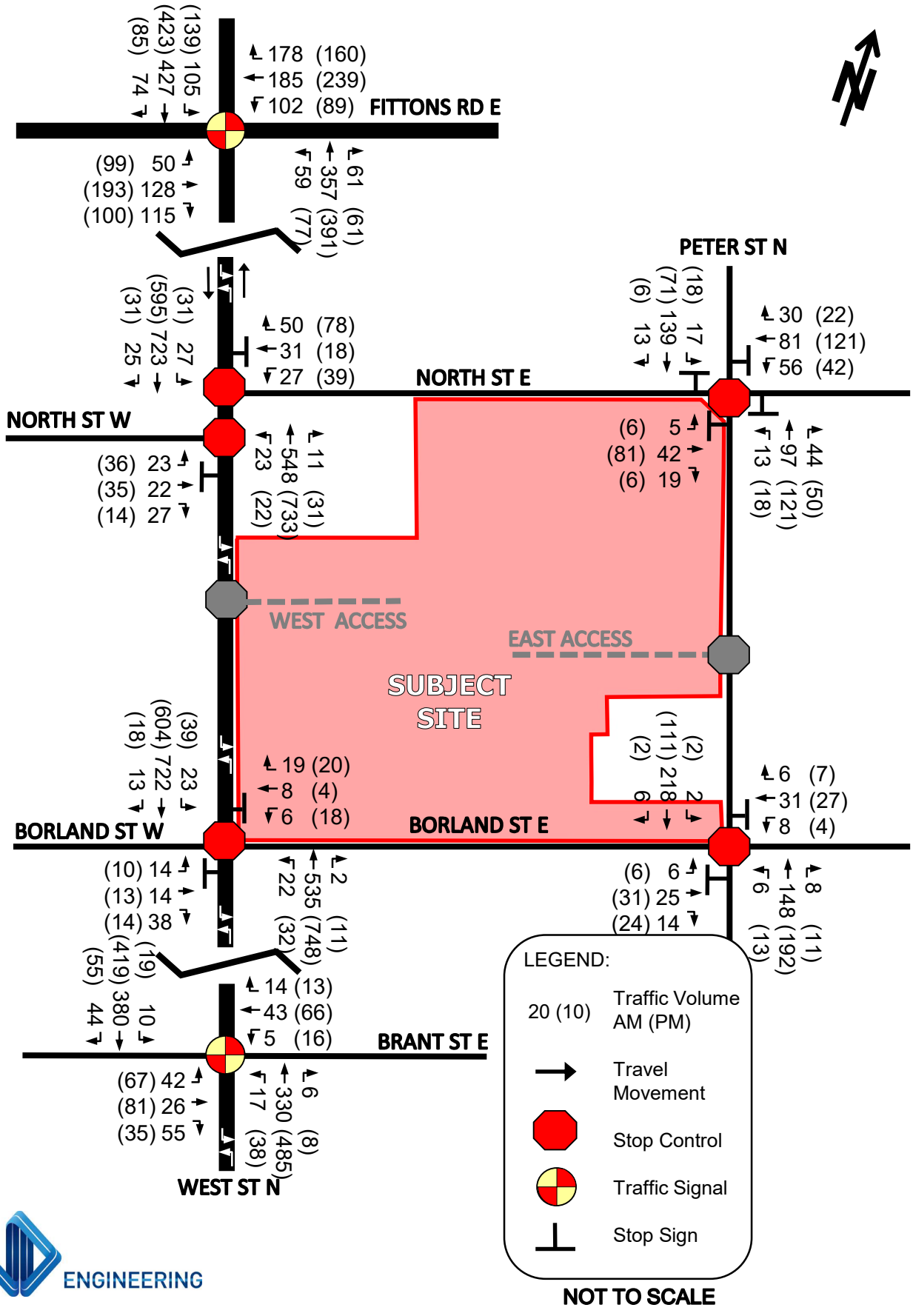
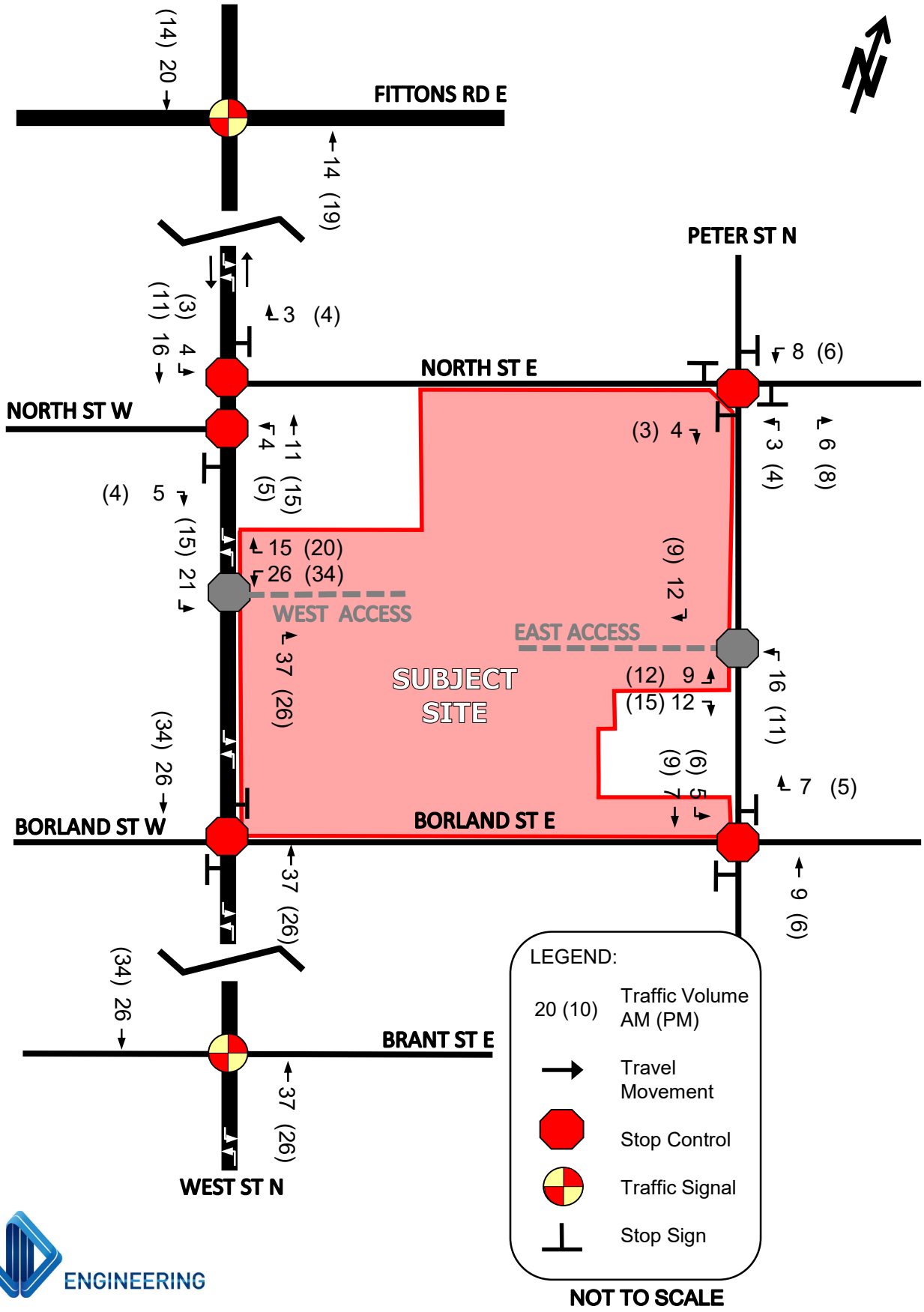


Figure 8: Site Traffic Assignment



ENGINEERING

Figure 9: Total (2022) Traffic Volumes

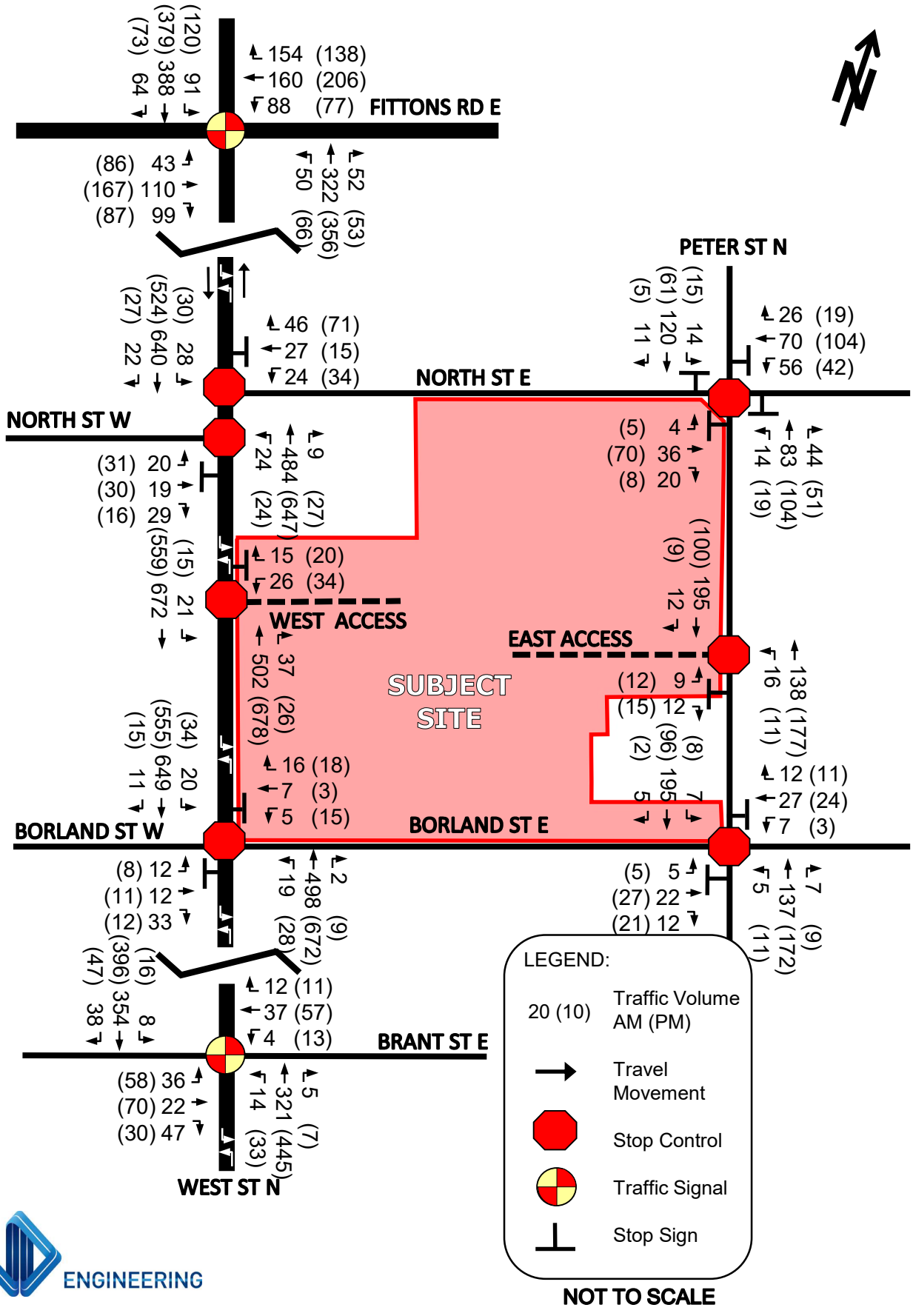
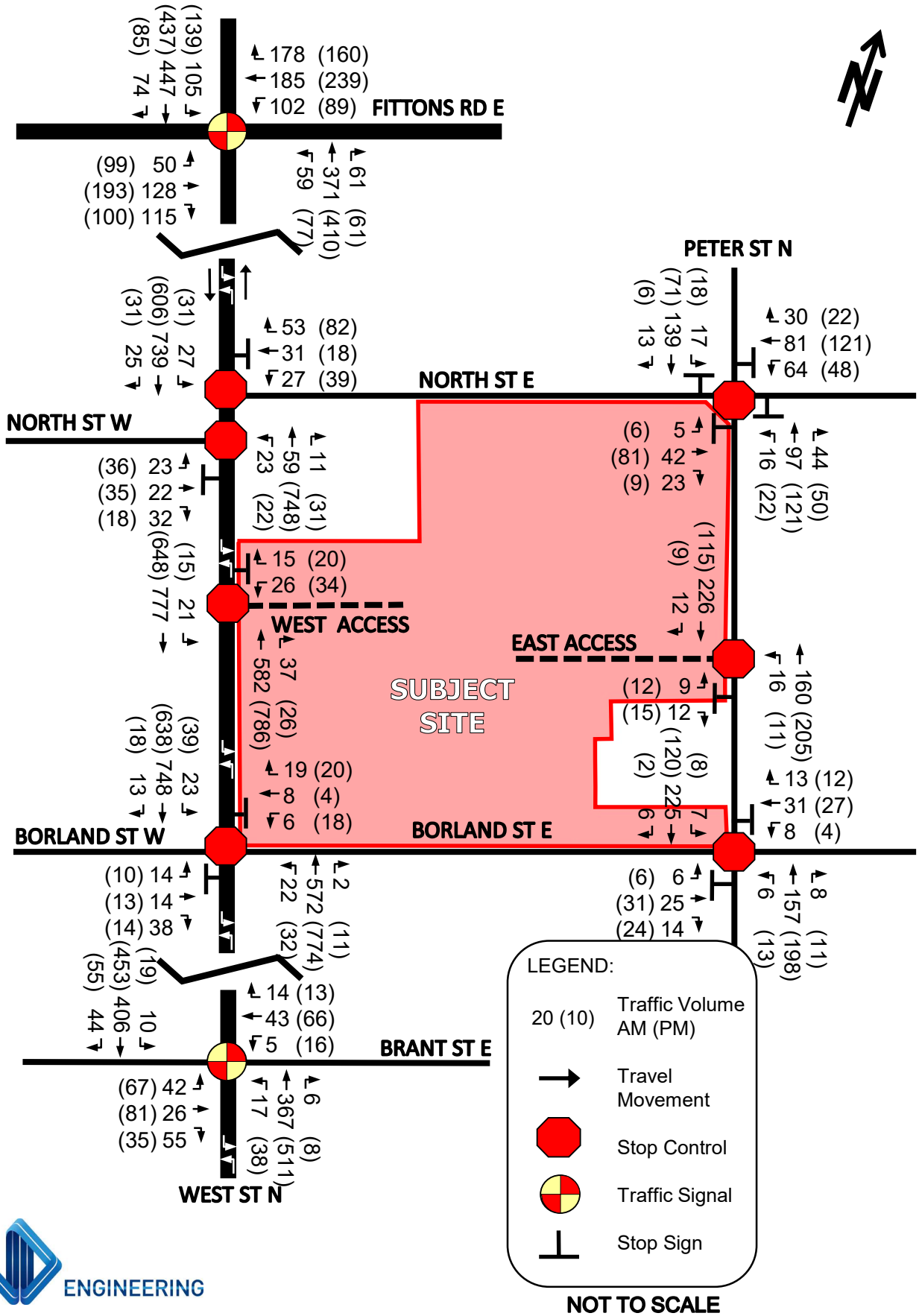
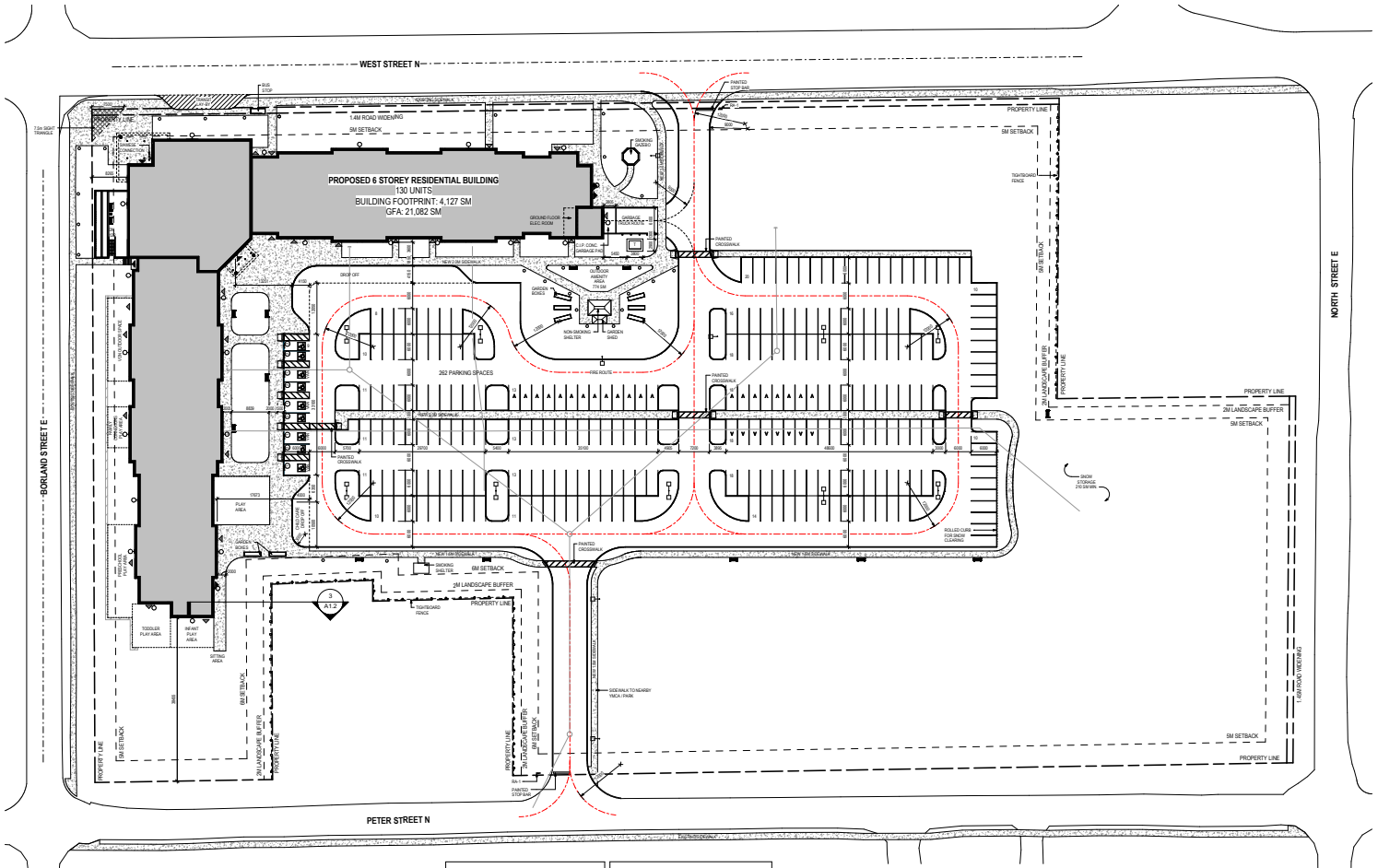


Figure 10: Total (2032) Traffic Volumes



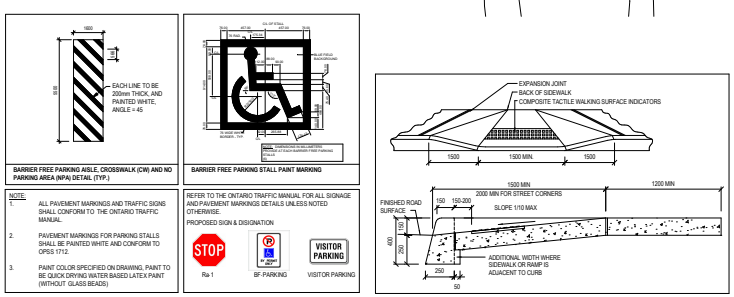
Appendix A –
Site Plan



1 A1.1 SITE PLAN
1 : 500

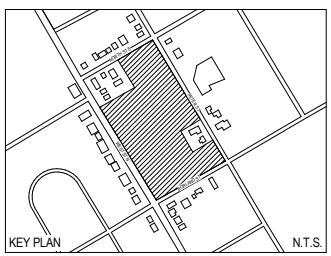
SITE STATISTICS

REGULATIONS		REQUIRED	PROVIDED
EXISTING ZONING: I1(H2) - INSTITUTIONAL, HOLD 2			RSI - RESIDENTIAL
MINIMUM LOT AREA		1000 SM	37,614 SM
MINIMUM LOT FRONTAGE		30M	227M
MAXIMUM LOT COVERAGE		60%	46%
REQUIRED YARDS (INTENSIFICATION ZONE)	FRONT (WEST ST N)	2.5M MIN. 5.0M MAX.	5.6M PROVIDED
	EXTERIOR SIDE (BORLAND ST)	2.5M MIN. 5.0M MAX.	8.3M PROVIDED
	INTERIOR SIDE	6.0M MIN.	6.0M
BUILDING HEIGHT		6.0M MIN. 20.5M MAX.	20.0 M PROVIDED
MIN. LANDSCAPED SPACE		40% OF LOT AREA	54%
PARKING SPACES	AFFORDABLE UNITS - 1 SPACE/UNIT STUDIO UNITS - 0.5 SPACES/UNIT	101 SPACES 15 SPACES	262 PROVIDED
	COMMERCIAL - 1 SPACE/30.0m2	136 SPACES	
	VISITOR - 25% OF RESIDENTIAL PARKING	29 SPACES	29 PROVIDED
BARRIER-FREE PARKING SPACE REQUIREMENTS OF TOTAL PARKING		4 - TYPE A 5 - TYPE B	4 - TYPE A 5 - TYPE B
BIKE PARKING SPACES		1 BIKE/ UNIT?	TBD
TOTAL GFA		N/A	21,082 SQ. M



2 A1.1 B.F. PARKING
1 : 125

3 A1.1 FLUSH CURB DETAIL
1 : 20



SITE PLAN LEGEND

286.00	EXISTING SPOT GRADE
+ 286.600	NEW FINISH GRADE
BH/TP	BORE HOLE (BH) TEST PIT (TP)
HYD.	YARD HYDRANT
CB	CATCH BASIN
	PEDESTRIAN ENTRY DOOR LOCATION
	SERVICE/ OVERHEAD DOOR LOCATION
	B.F. PARKING STALL
	B.F. CURB CUT - WITH DETECTABLE GROOVES
S.C.	SIAMESE CONNECTION
	LIGHT STANDARD
	WALL MOUNTED LIGHT FIXTURE
CJ	CONTROL JOINT
	ASPHALT TYPE 1
	CONCRETE WALKWAY
	FIRE HYDRANT
HP	HYDRO POLE
T	TRANSFORMER
	PAINTED STOP BAR
HB	HOSE BIB
	LIGHT BOLLARD
	SITE FURNITURE

SIGN LEGEND

	BARRIER FREE PARKING - TYPE A (VAN)
	BARRIER FREE PARKING - TYPE B
V	VISITOR PARKING c/w PAINTED 'V'
RA-1	STOP SIGN

No.	REVISION	DATE

REVISIONS

ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON SITE. DISCREPANCIES TO BE REPORTED TO THE ARCHITECT. LATEST APPROVED STAMPED DRAWINGS ONLY TO BE USED FOR CONSTRUCTION.

PROJECT NORTH

MCL ARCHITECTS
MCKNIGHT CHARRON LIMITED
48 ALLIANCE BLVD. UNIT 110
BARRIE, ONTARIO L4M 6K3
WWW.MCLARCHITECTS.CA
T 705 722 6709
F 705 726 5418

DRAWING TITLE:
SITE PLAN

PROJECT NAME:
SIMCOE COUNTY SERVICE CAMPUS - ORILLIA
2 BORLAND STREET EAST, ORILLIA, ON

DATE:	NOVEMBER 04, 2020	PROJECT #	SHEET #
DRAWN BY:	KB		A1.1
SCALE:	As indicated		

Appendix B –
Background Development Excerpts

12 Fittons Road East

City of Orillia

Traffic Impact Study for

Rockport Holdings Inc.

Type of Document:
Final Report

Project Number:
JDE – 18060

Date Submitted:
December 6th, 2018
Revised August 2nd, 2019

John Northcote, P.Eng.
Professional License #: 100124071

ENGINEERING

JD Northcote Engineering Inc.
86 Cumberland Street
Barrie, ON
705.725.4035
www.JDEngineering.ca

Table 7 – Proposed Development Traffic Distribution

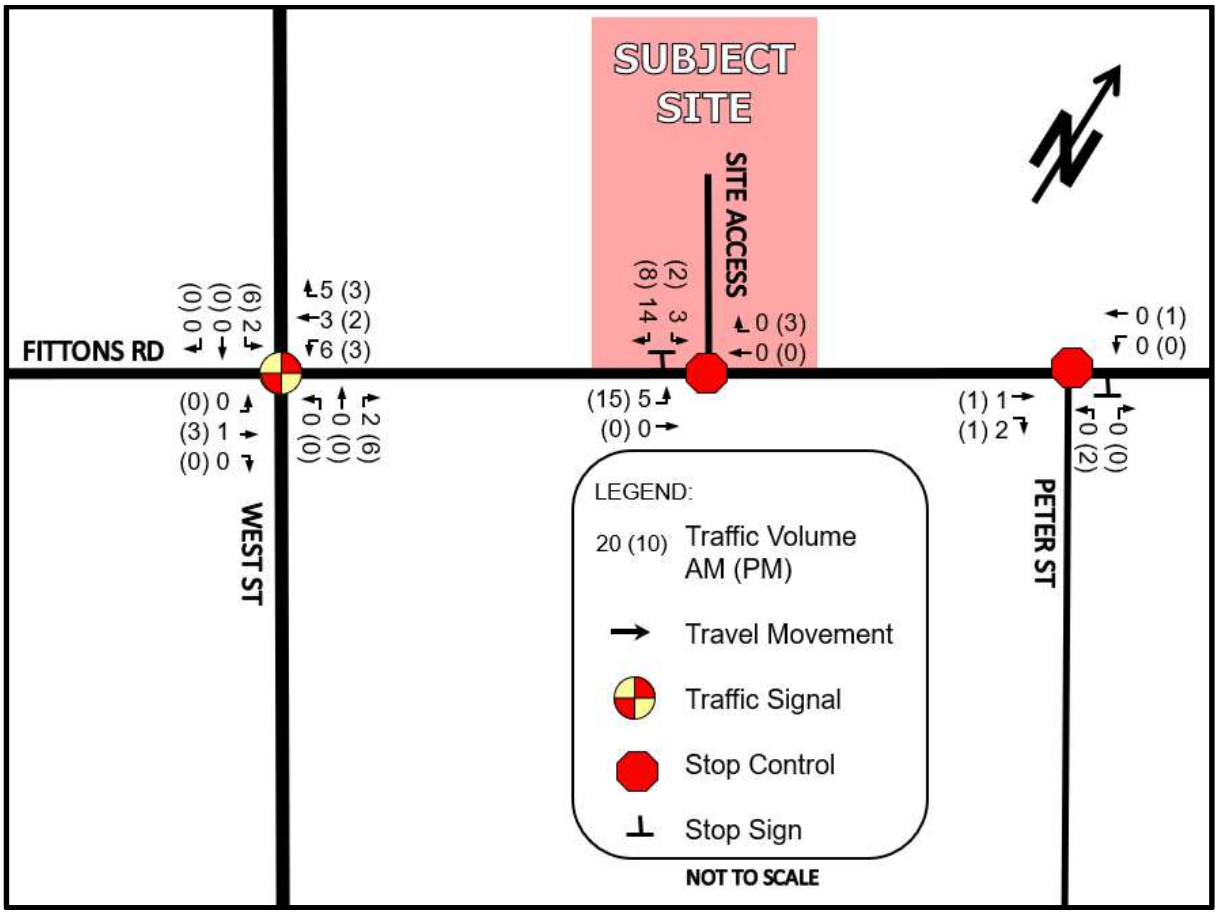
Travel Direction (to / from)	Percentage of Total Traffic Generation
North via West Street North	32.4%
South via West Street North	35.2%
South via Peter Street	9.0%
East via Fittons Road	7.1%
West via Fittons Road	16.3%
TOTAL	**100%**

Using the traffic distribution pattern noted above, the site traffic assignment for the proposed development was calculated for the AM and PM peak hour and is illustrated in **Figure 6**.

4.3 Total Horizon Year Traffic Volumes with the Proposed Development

For the total (2020 and 2030) horizon year traffic volumes, the proposed development traffic was added to the background (2020 and 2030) traffic volumes. The resulting total (2020 and 2030) horizon year traffic volume for the AM and PM peak hour are illustrated in **Figures 7** and **8**.

Figure 6 – Proposed Development Traffic Assignment



Appendix C –
Traffic Count Data

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

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: Orilia
Site #: 2007800001
Intersection: West St N & North St
TFR File #: 1
Count date: 15-Oct-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

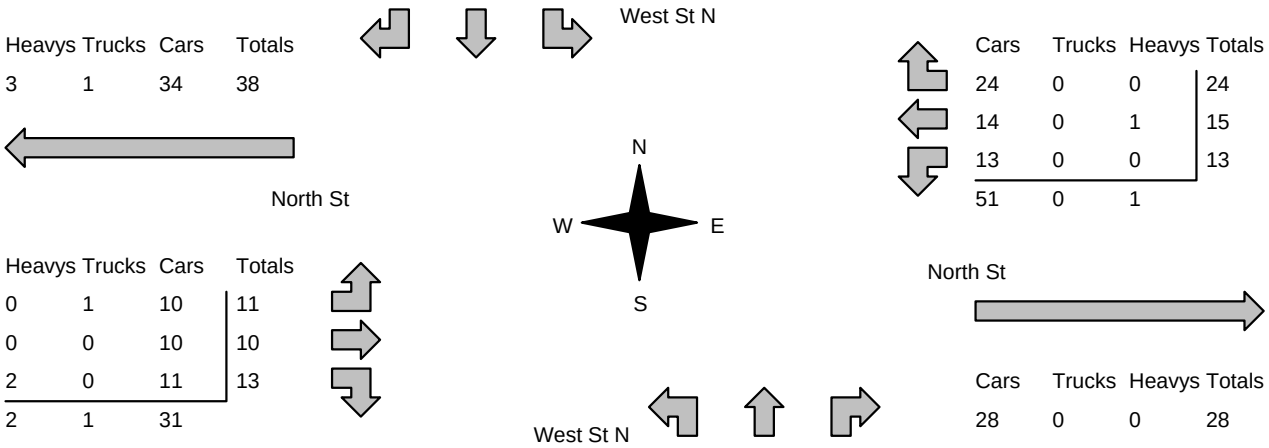
Major Road: West St N runs N/S

North Leg Total:	664
North Entering:	368
North Peds:	3
Peds Cross:	⋈

Heavys	0	9	0	9
Trucks	1	8	0	9
Cars	11	326	13	350
Totals	12	343	13	

Heavys	11
Trucks	6
Cars	279
Totals	296

East Leg Total:	80
East Entering:	52
East Peds:	2
Peds Cross:	⧖



Peds Cross:	⧖
West Peds:	4
West Entering:	34
West Leg Total:	72

Cars	350			
Trucks	8			
Heavys	11			
Totals	369			

Cars	9	245	5	259
Trucks	0	5	0	5
Heavys	2	11	0	13
Totals	11	261	5	

Peds Cross:	⋈
South Peds:	0
South Entering:	277
South Leg Total:	646

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Orilia
Site #: 2007800001
Intersection: West St N & North St
TFR File #: 1
Count date: 15-Oct-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

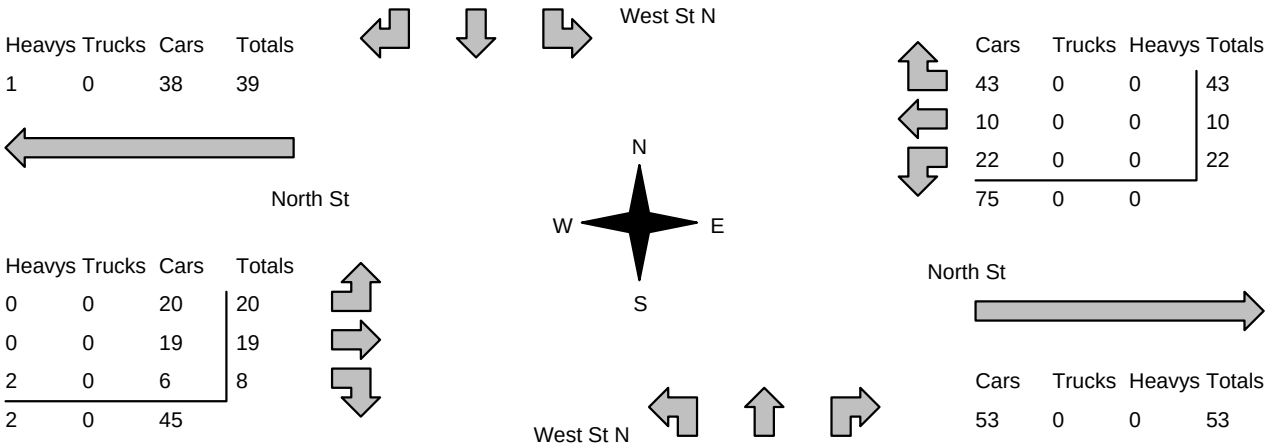
Major Road: West St N runs N/S

North Leg Total:	832
North Entering:	364
North Peds:	2
Peds Cross:	⋈

Heavys	1	1	0	2
Trucks	0	1	0	1
Cars	16	328	17	361
Totals	17	330	17	

Heavys	3
Trucks	1
Cars	464
Totals	468

East Leg Total:	128
East Entering:	75
East Peds:	5
Peds Cross:	⧖



Peds Cross:	⧖
West Peds:	1
West Entering:	47
West Leg Total:	86

Cars	356			
Trucks	1			
Heavys	3			
Totals	360			

Cars	12	401	17	430
Trucks	0	1	0	1
Heavys	0	3	0	3
Totals	12	405	17	

Peds Cross:	⋈
South Peds:	0
South Entering:	434
South Leg Total:	794

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

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: Orilia
Site #: 2007800002
Intersection: Peter St & North St
TFR File #: 1
Count date: 15-Oct-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

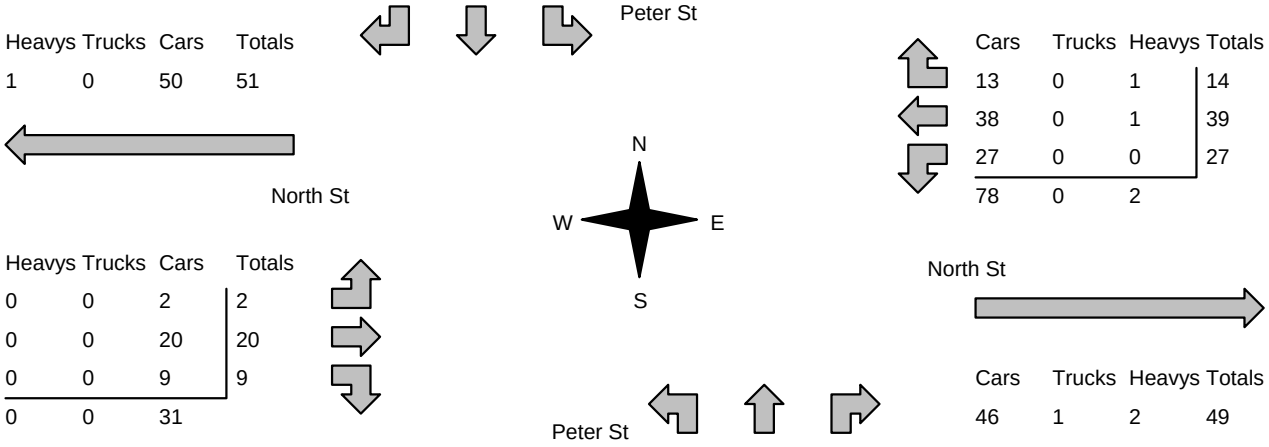
Major Road: Peter St runs N/S

North Leg Total: 142
North Entering: 80
North Peds: 7
Peds Cross: ⋈

Heavys	0	0	1	1
Trucks	0	1	0	1
Cars	6	65	7	78
Totals	6	66	8	

Heavys	1
Trucks	0
Cars	61
Totals	62

East Leg Total: 129
East Entering: 80
East Peds: 7
Peds Cross: ⧖



Heavys	Trucks	Cars	Totals
1	0	50	51

Cars	Trucks	Heavys	Totals
13	0	1	14
38	0	1	39
27	0	0	27
78	0	2	

Heavys	Trucks	Cars	Totals
0	0	2	2
0	0	20	20
0	0	9	9
0	0	31	

Cars	Trucks	Heavys	Totals
46	1	2	49

Peds Cross: ⧖
West Peds: 1
West Entering: 31
West Leg Total: 82

Cars	6	46	19	71
Trucks	0	0	1	1
Heavys	0	0	1	1
Totals	6	46	21	

Cars	101
Trucks	1
Heavys	0
Totals	102

Peds Cross: ⋈
South Peds: 3
South Entering: 73
South Leg Total: 175

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

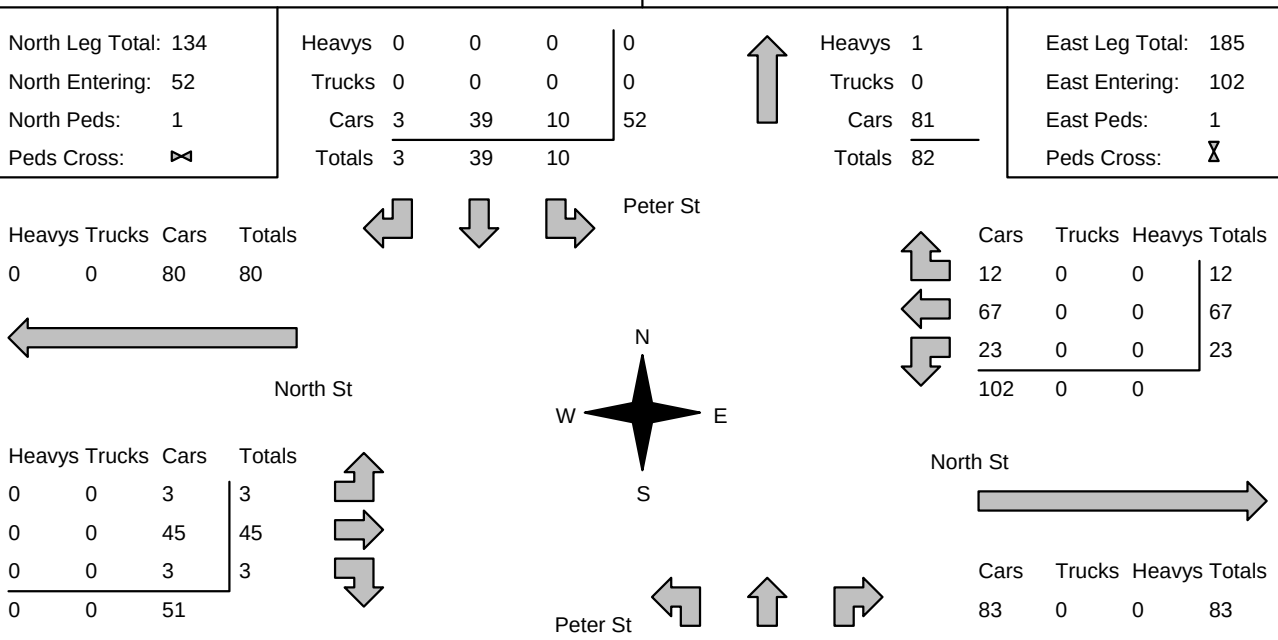
Municipality: Orilia
Site #: 2007800002
Intersection: Peter St & North St
TFR File #: 1
Count date: 15-Oct-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Peter St runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

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

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

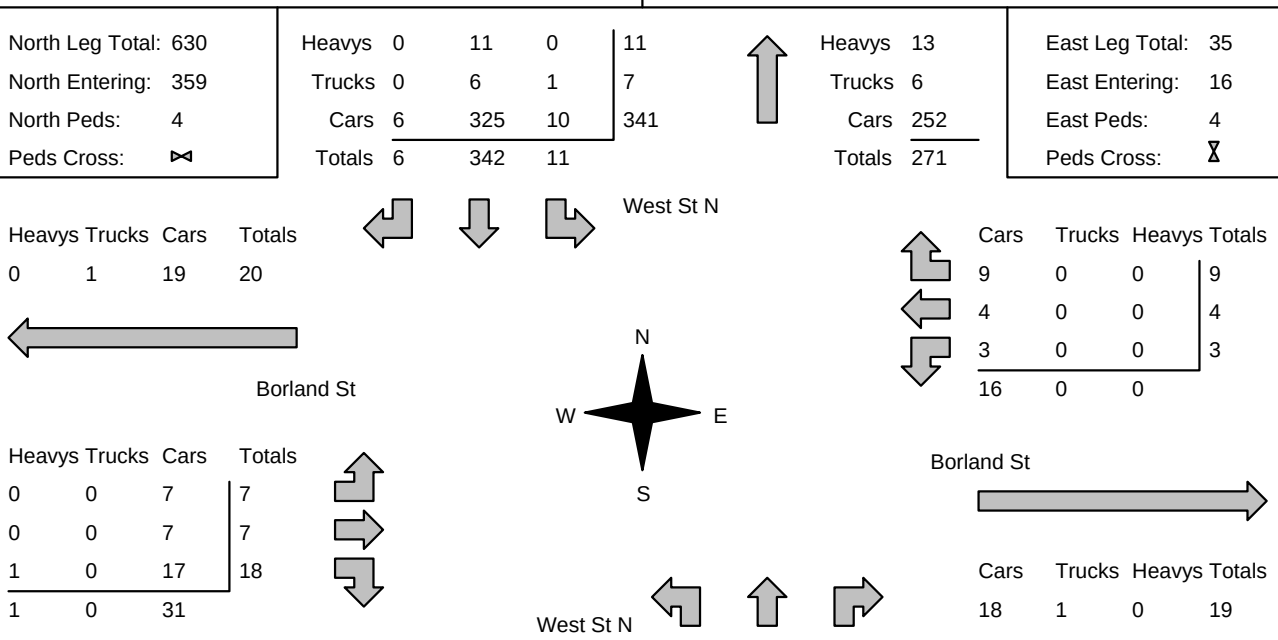
Municipality: Orilia
Site #: 2007800003
Intersection: West St N & Borland St
TFR File #: 1
Count date: 15-Oct-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: West St N runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

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

Municipality: Orilia
Site #: 2007800003
Intersection: West St N & Borland St
TFR File #: 1
Count date: 15-Oct-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: West St N runs N/S

North Leg Total:	797
North Entering:	367
North Peds:	3
Peds Cross:	⋈

Heavys	0	3	0	3
Trucks	0	1	1	2
Cars	10	331	21	362
Totals	10	335	22	

Heavys	5
Trucks	2
Cars	423
Totals	430

East Leg Total:	58
East Entering:	23
East Peds:	2
Peds Cross:	⧖

West St N

Heavys	Trucks	Cars	Totals
0	0	30	30

Cars	Trucks	Heavys	Totals
11	0	0	11
2	0	0	2
9	1	0	10
22	1	0	

Borland St

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	4	5
0	0	7	7
0	0	8	8
1	0	19	

Borland St

Cars	Trucks	Heavys	Totals
34	1	0	35

West St N

Peds Cross:	⧖
West Peds:	2
West Entering:	20
West Leg Total:	50

Cars	348			
Trucks	2			
Heavys	3			
Totals	353			

Cars	18	408	6	432
Trucks	0	2	0	2
Heavys	0	4	0	4
Totals	18	414	6	

Peds Cross:	⋈
South Peds:	1
South Entering:	438
South Leg Total:	791

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

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: Orilia
Site #: 2007800004
Intersection: Peter St & Borland St
TFR File #: 1
Count date: 15-Oct-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Peter St runs N/S

North Leg Total: 176
North Entering: 105
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	0	104	1	105
Totals	0	104	1	

Heavys	1
Trucks	1
Cars	69
Totals	71

East Leg Total: 36
East Entering: 19
East Peds: 2
Peds Cross: ⧖

Peter St

Heavys	Trucks	Cars	Totals
0	0	18	18

Borland St

Cars	Trucks	Heavys	Totals
0	0	0	0
15	0	0	15
4	0	0	4
19	0	0	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
0	1	11	12
0	0	7	7
0	1	18	

Borland St

Cars	Trucks	Heavys	Totals
16	1	0	17

Peter St

Peds Cross: ⧖
West Peds: 3
West Entering: 19
West Leg Total: 37

Cars	115
Trucks	0
Heavys	0
Totals	115

Cars	3	69	4	76
Trucks	0	1	0	1
Heavys	0	1	0	1
Totals	3	71	4	

Peds Cross: ⋈
South Peds: 0
South Entering: 78
South Leg Total: 193

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Orilia
Site #: 2007800004
Intersection: Peter St & Borland St
TFR File #: 1
Count date: 15-Oct-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Peter St runs N/S

North Leg Total: 175
North Entering: 64
North Peds: 2
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	1	62	1	64
Totals	1	62	1	

Heavys	0
Trucks	1
Cars	110
Totals	111

East Leg Total: 45
East Entering: 21
East Peds: 3
Peds Cross: ⧗

Peter St

Heavys	Trucks	Cars	Totals
0	2	21	23

Borland St

	Cars	Trucks	Heavys	Totals
	4	0	0	4
	13	2	0	15
	2	0	0	2
	19	2	0	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
0	1	16	17
0	0	13	13
0	1	29	

Borland St

Cars	Trucks	Heavys	Totals
23	1	0	24

Peter St

Peds Cross: ⧗
West Peds: 2
West Entering: 30
West Leg Total: 53

Cars	77
Trucks	0
Heavys	0
Totals	77

Cars	7	106	6	119
Trucks	0	1	0	1
Heavys	0	0	0	0
Totals	7	107	6	

Peds Cross: ⋈
South Peds: 3
South Entering: 120
South Leg Total: 197

Comments

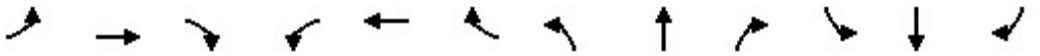
File Name: C:\Users\ldobson\AppData\Roaming\SIRE\FileCenter\~LaunchCache\321\409726.ppd
Start Date: 2016-07-07
Start Time: 8:00:00 AM
Site Code: 00000000
Comment 1: Brant Street & West Street
Comment 2: Partly Cloudy
Comment 3:
Comment 4:

	WEST From North				BRANT From East				WEST From South				BRANT From West			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
08:00	11	52	0	2	0	5	0	0	1	24	2	0	2	6	2	0
08:15	18	67	3	5	1	10	0	1	1	43	6	0	11	6	10	3
08:30	6	49	0	1	3	5	1	2	5	32	4	0	9	7	2	0
08:45	6	56	1	0	2	11	1	2	0	48	4	0	4	6	4	0
09:00	5	73	1	2	2	7	1	0	0	59	5	0	14	5	4	0
09:15	7	81	1	8	3	12	1	1	2	73	2	0	10	7	13	2
09:30	12	73	5	0	2	6	0	3	2	78	4	0	8	3	2	0
09:45	11	68	1	0	4	9	2	3	1	48	2	0	11	6	14	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	8	78	3	0	2	11	0	1	2	86	5	0	3	12	12	0
11:15	7	92	5	1	4	9	0	0	3	75	4	0	4	6	11	0
11:30	4	83	2	2	3	6	2	0	1	71	6	0	3	6	8	0
11:45	7	85	5	4	0	10	1	1	0	79	4	1	12	10	6	2
12:00	8	90	2	0	1	6	4	0	3	84	2	0	7	8	7	2
12:15	10	81	1	1	2	6	2	1	0	72	4	2	6	10	7	0
12:30	14	81	1	1	2	6	3	1	0	73	2	0	7	8	7	2
12:45	11	105	3	0	0	13	2	0	4	88	5	0	13	9	11	0
13:00	7	93	3	1	4	15	0	1	0	67	7	0	7	11	5	0
13:15	7	94	7	1	7	11	7	0	1	81	5	3	5	9	4	0
13:30	14	83	1	1	1	3	3	0	0	78	2	1	10	6	9	0
13:45	9	91	8	0	3	5	1	0	0	87	3	0	10	7	6	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	14	80	3	4	7	12	1	0	2	86	9	0	13	7	8	8
15:15	8	95	4	1	0	10	1	0	1	80	4	1	11	4	3	0
15:30	9	80	3	3	4	9	0	0	1	72	3	0	7	6	14	1
15:45	9	84	1	0	4	12	3	0	1	110	6	0	3	10	6	0
16:00	10	85	1	0	2	10	3	0	0	90	5	3	3	8	18	0
16:15	10	71	3	1	4	17	2	0	0	98	8	5	4	15	20	0
16:30	14	91	5	0	3	9	1	0	2	93	9	2	13	25	14	2
16:45	7	85	4	0	2	15	2	0	3	94	3	3	2	11	14	0
17:00	12	81	3	1	1	11	7	0	2	93	10	3	8	13	5	0
17:15	5	66	3	0	0	15	2	0	4	99	4	0	4	5	8	0
17:30	10	78	3	0	4	13	1	0	1	74	9	0	6	14	6	2
17:45	6	82	2	0	2	11	2	0	0	87	4	1	8	15	9	2

Start Date: 2016-06-14
Start Time: 8:00:00 AM
Comment 1: Fittons and West
Comment 4: Sunny

	WEST ST From North				FITTONS ST From East				WEST ST From South				FITTONS ST From West			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
08:00	17	55	11	1	47	24	11	0	9	40	7	2	6	13	8	0
08:15	14	74	14	4	44	38	22	2	6	52	6	5	12	17	21	5
08:30	10	39	15	4	35	32	18	1	7	51	5	9	16	15	13	3
08:45	13	75	18	0	36	34	18	7	6	63	5	9	14	25	14	6
09:00	14	84	18	8	32	28	24	8	14	70	5	9	22	29	11	9
09:15	11	105	36	0	42	55	23	7	17	79	19	7	34	37	11	8
09:30	18	71	14	7	30	27	14	6	10	67	13	3	22	19	9	4
09:45	15	76	13	4	33	33	14	6	5	66	9	2	12	15	9	5
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	18	78	22	2	32	39	11	4	7	77	14	2	15	28	16	3
11:15	21	71	20	1	38	40	17	3	5	72	9	2	15	25	19	4
11:30	22	79	23	4	33	35	15	1	5	73	11	5	15	25	13	0
11:45	19	78	17	30	40	43	13	28	11	78	16	5	15	30	23	4
12:00	18	71	29	2	39	28	14	4	7	87	13	3	11	32	13	1
12:15	20	51	21	4	31	36	12	5	10	87	14	9	11	49	19	2
12:30	22	69	22	7	24	31	11	7	8	89	11	6	11	30	21	8
12:45	12	84	28	6	29	35	17	6	8	80	6	9	11	34	23	7
13:00	22	59	21	1	37	42	10	3	12	86	17	0	14	31	23	2
13:15	15	83	20	3	43	37	14	2	8	81	9	3	16	32	17	9
13:30	22	76	21	4	36	21	11	3	6	65	8	31	18	31	18	27
13:45	18	67	20	4	29	35	8	8	7	65	14	3	15	32	14	5
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	17	119	30	16	32	36	18	12	12	73	13	13	23	49	22	8
15:15	18	83	26	13	34	85	20	19	9	89	16	1	16	42	15	8
15:30	13	63	27	5	25	34	15	6	10	72	15	11	21	22	29	6
15:45	19	69	22	10	32	32	15	6	12	74	16	10	19	37	12	8
16:00	18	70	36	6	36	47	13	8	12	89	16	7	13	36	16	5
16:15	21	66	24	9	29	33	13	3	9	86	18	5	21	38	14	3
16:30	19	84	38	0	43	36	14	4	15	69	19	5	14	29	16	1
16:45	12	70	21	7	38	30	20	6	9	105	13	9	23	30	19	3
17:00	17	61	33	4	41	46	11	5	9	90	15	11	18	22	21	2
17:15	29	88	39	2	44	44	16	6	5	97	19	2	16	37	25	2
17:30	26	70	42	5	44	34	9	2	7	67	12	4	15	39	22	4
17:45	17	57	30	4	42	43	15	5	8	68	6	8	11	34	14	4

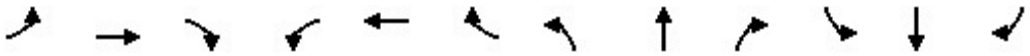
Appendix D –
Synchro Analysis Output –
Existing Traffic Volumes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	12	32	5	7	16	18	446	2	19	599	11
Future Volume (Veh/h)	12	12	32	5	7	16	18	446	2	19	599	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.57	0.57	0.57	0.78	0.78	0.78	0.77	0.77	0.77
Hourly flow rate (vph)	15	15	40	9	12	28	23	572	3	25	778	14
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1507	1476	800	1510	1482	594	802			585		
vC1, stage 1 conf vol	845	845		630	630							
vC2, stage 2 conf vol	662	631		880	852							
vCu, unblocked vol	1507	1476	800	1510	1482	594	802			585		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	94	95	89	96	96	94	97			97		
cM capacity (veh/h)	260	294	379	230	286	495	780			947		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	70	49	23	575	25	792
Volume Left	15	9	23	0	25	0
Volume Right	40	28	0	3	0	14
cSH	327	356	780	1700	947	1700
Volume to Capacity	0.21	0.14	0.03	0.34	0.03	0.47
Queue Length 95th (m)	6.1	3.6	0.7	0.0	0.6	0.0
Control Delay (s)	19.0	16.7	9.8	0.0	8.9	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	19.0	16.7	0.4		0.3	
Approach LOS	C	C				

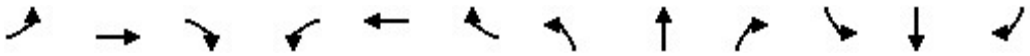
Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	45.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	21	12	7	26	5	5	124	7	2	182	5
Future Volume (Veh/h)	5	21	12	7	26	5	5	124	7	2	182	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.59	0.59	0.67	0.67	0.67	0.81	0.81	0.81	0.65	0.65	0.65
Hourly flow rate (vph)	8	36	20	10	39	7	6	153	9	3	280	8
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	496	474	294	508	474	168	293			167		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	496	474	294	508	474	168	293			167		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	92	97	98	92	99	100			100		
cM capacity (veh/h)	441	472	738	426	481	868	1262			1404		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	64	56	168	291
Volume Left	8	10	6	3
Volume Right	20	7	9	8
cSH	527	497	1262	1404
Volume to Capacity	0.12	0.11	0.00	0.00
Queue Length 95th (m)	3.1	2.9	0.1	0.0
Control Delay (s)	12.8	13.2	0.3	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	12.8	13.2	0.3	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	22.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	35	16	47	68	25	11	81	37	14	116	11
Future Volume (vph)	4	35	16	47	68	25	11	81	37	14	116	11
Peak Hour Factor	0.78	0.78	0.78	0.63	0.63	1.00	0.70	0.70	0.70	0.57	0.57	0.57
Hourly flow rate (vph)	5	45	21	75	108	25	16	116	53	25	204	19

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	71	208	185	248
Volume Left (vph)	5	75	16	25
Volume Right (vph)	21	25	53	19
Hadj (s)	-0.13	0.21	-0.08	0.03
Departure Headway (s)	5.2	5.3	4.9	4.9
Degree Utilization, x	0.10	0.31	0.25	0.34
Capacity (veh/h)	613	627	681	684
Control Delay (s)	8.8	10.6	9.6	10.5
Approach Delay (s)	8.8	10.6	9.6	10.5
Approach LOS	A	B	A	B

Intersection Summary				
Delay	10.1			
Level of Service	B			
Intersection Capacity Utilization	32.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	49	42	476	27	23	621
Future Volume (Veh/h)	49	42	476	27	23	621
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.61	0.61	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	80	69	595	34	26	714
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1393	627			639	
vC1, stage 1 conf vol	622					
vC2, stage 2 conf vol	771					
vCu, unblocked vol	1393	627			639	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	78	86			97	
cM capacity (veh/h)	360	476			936	

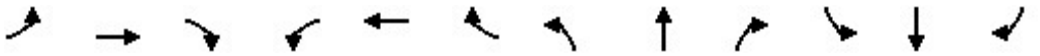
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	149	629	26	714
Volume Left	80	0	26	0
Volume Right	69	34	0	0
cSH	406	1700	936	1700
Volume to Capacity	0.37	0.37	0.03	0.42
Queue Length 95th (m)	12.6	0.0	0.7	0.0
Control Delay (s)	18.9	0.0	9.0	0.0
Lane LOS	C		A	
Approach Delay (s)	18.9	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	23	19	466	623	47
Future Volume (Veh/h)	37	23	19	466	623	47
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.48	0.48	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	77	48	24	583	716	54
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1384	753	775			
vC1, stage 1 conf vol	748					
vC2, stage 2 conf vol	636					
vCu, unblocked vol	1384	753	775			
tC, single (s)	6.4	6.3	4.2			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4	2.3			
p0 queue free %	79	88	97			
cM capacity (veh/h)	365	390	786			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	125	24	583	770
Volume Left	77	24	0	0
Volume Right	48	0	0	54
cSH	374	786	1700	1700
Volume to Capacity	0.33	0.03	0.34	0.45
Queue Length 95th (m)	10.9	0.7	0.0	0.0
Control Delay (s)	19.4	9.7	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.4	0.4		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

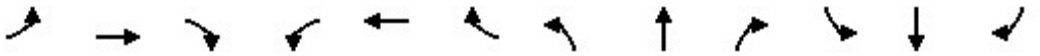


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	22	46	4	36	12	14	274	5	8	313	37
Future Volume (vph)	35	22	46	4	36	12	14	274	5	8	313	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.97	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803	1555		1798		1785	1878		1785	1849	
Flt Permitted		0.77	1.00		0.97		0.54	1.00		0.56	1.00	
Satd. Flow (perm)		1435	1555		1743		1015	1878		1045	1849	
Peak-hour factor, PHF	0.78	0.78	0.78	0.76	0.76	0.76	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	45	28	59	5	47	16	17	334	6	9	333	39
RTOR Reduction (vph)	0	0	52	0	14	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	73	7	0	54	0	17	339	0	9	368	0
Confl. Peds. (#/hr)	13		5	5		13	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		7.5	7.5		7.5		48.0	48.0		48.0	48.0	
Effective Green, g (s)		7.5	7.5		7.5		48.0	48.0		48.0	48.0	
Actuated g/C Ratio		0.11	0.11		0.11		0.71	0.71		0.71	0.71	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		159	172		193		721	1335		743	1314	
v/s Ratio Prot								0.18			c0.20	
v/s Ratio Perm		c0.05	0.00		0.03		0.02			0.01		
v/c Ratio		0.46	0.04		0.28		0.02	0.25		0.01	0.28	
Uniform Delay, d1		28.1	26.8		27.5		2.9	3.4		2.8	3.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1	0.1		0.8		0.1	0.5		0.0	0.5	
Delay (s)		30.2	26.9		28.3		2.9	3.9		2.9	4.0	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		28.7			28.3			3.9			4.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	106	96	80	152	145	49	299	49	86	357	62
Future Volume (vph)	42	106	96	80	152	145	49	299	49	86	357	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.94			0.94			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3293			3289			3473			3463	
Flt Permitted		0.68			0.78			0.82			0.78	
Satd. Flow (perm)		2250			2577			2848			2712	
Peak-hour factor, PHF	0.70	0.70	0.70	0.74	0.74	0.74	0.81	0.81	0.81	0.78	0.78	0.78
Adj. Flow (vph)	60	151	137	108	205	196	60	369	60	110	458	79
RTOR Reduction (vph)	0	108	0	0	133	0	0	8	0	0	10	0
Lane Group Flow (vph)	0	240	0	0	376	0	0	481	0	0	637	0
Confl. Peds. (#/hr)	25		25	25		25	35		35	35		35
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.7			15.7			46.2			46.2	
Effective Green, g (s)		15.7			15.7			46.2			46.2	
Actuated g/C Ratio		0.21			0.21			0.63			0.63	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		478			547			1780			1695	
v/s Ratio Prot												
v/s Ratio Perm		0.11			c0.15			0.17			c0.23	
v/c Ratio		0.50			0.69			0.27			0.38	
Uniform Delay, d1		25.7			26.8			6.2			6.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			3.6			0.4			0.1	
Delay (s)		26.5			30.4			6.6			6.9	
Level of Service		C			C			A			A	
Approach Delay (s)		26.5			30.4			6.6			6.9	
Approach LOS		C			C			A			A	

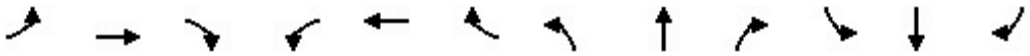
Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	14.0
Intersection Capacity Utilization	116.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	11	12	15	3	17	27	621	9	33	503	15
Future Volume (Veh/h)	8	11	12	15	3	17	27	621	9	33	503	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.90	0.90	0.90	0.92	0.92	0.92
Hourly flow rate (vph)	10	13	14	19	4	22	30	690	10	36	547	16
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1421	1407	570	1410	1410	715	573			710		
vC1, stage 1 conf vol	637	637		765	765							
vC2, stage 2 conf vol	784	770		644	645							
vCu, unblocked vol	1421	1407	570	1410	1410	715	573			710		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.3	5.5							
tF (s)	3.5	4.0	3.3	3.7	4.0	3.3	2.2			2.2		
p0 queue free %	96	96	97	93	99	95	97			96		
cM capacity (veh/h)	264	297	513	265	304	422	990			867		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	37	45	30	700	36	563
Volume Left	10	19	30	0	36	0
Volume Right	14	22	0	10	0	16
cSH	340	329	990	1700	867	1700
Volume to Capacity	0.11	0.14	0.03	0.41	0.04	0.33
Queue Length 95th (m)	2.8	3.6	0.7	0.0	1.0	0.0
Control Delay (s)	16.9	17.7	8.7	0.0	9.3	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	16.9	17.7	0.4		0.6	
Approach LOS	C	C				

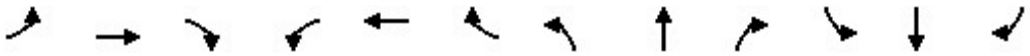
Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	26	20	3	23	6	11	161	9	2	93	2
Future Volume (Veh/h)	5	26	20	3	23	6	11	161	9	2	93	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.77	0.77	0.77	0.70	0.70	0.70
Hourly flow rate (vph)	7	35	27	3	26	7	14	209	12	3	133	3
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	414	400	144	438	395	225	141			226		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	414	400	144	438	395	225	141			226		
tC, single (s)	7.1	6.6	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	99	93	97	99	95	99	99			100		
cM capacity (veh/h)	510	521	894	474	514	806	1435			1336		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	69	36	235	139
Volume Left	7	3	14	3
Volume Right	27	7	12	3
cSH	621	549	1435	1336
Volume to Capacity	0.11	0.07	0.01	0.00
Queue Length 95th (m)	2.8	1.6	0.2	0.1
Control Delay (s)	11.5	12.0	0.5	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	11.5	12.0	0.5	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	26.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	68	5	34	101	18	15	101	42	15	59	5
Future Volume (vph)	5	68	5	34	101	18	15	101	42	15	59	5
Peak Hour Factor	0.63	0.63	0.63	0.72	0.72	0.72	0.72	0.72	0.72	0.62	0.62	0.62
Hourly flow rate (vph)	8	108	8	47	140	25	21	140	58	24	95	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	124	212	219	127
Volume Left (vph)	8	47	21	24
Volume Right (vph)	8	25	58	8
Hadj (s)	0.01	0.01	-0.11	0.03
Departure Headway (s)	5.1	5.0	4.8	5.1
Degree Utilization, x	0.18	0.29	0.29	0.18
Capacity (veh/h)	643	674	695	644
Control Delay (s)	9.2	10.0	9.9	9.2
Approach Delay (s)	9.2	10.0	9.9	9.2
Approach LOS	A	B	A	A

Intersection Summary				
Delay		9.7		
Level of Service		A		
Intersection Capacity Utilization		32.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	48	65	638	55	26	521
Future Volume (Veh/h)	48	65	638	55	26	521
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	54	73	709	61	28	566
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1376	754			780	
vC1, stage 1 conf vol	750					
vC2, stage 2 conf vol	627					
vCu, unblocked vol	1376	754			780	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	82			97	
cM capacity (veh/h)	365	403			829	

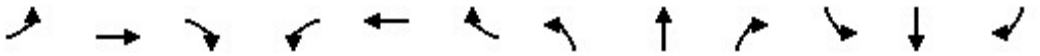
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	127	770	28	566
Volume Left	54	0	28	0
Volume Right	73	61	0	0
cSH	386	1700	829	1700
Volume to Capacity	0.33	0.45	0.03	0.33
Queue Length 95th (m)	10.7	0.0	0.8	0.0
Control Delay (s)	18.8	0.0	9.5	0.0
Lane LOS	C		A	
Approach Delay (s)	18.8	0.0	0.4	
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	12	18	634	528	41
Future Volume (Veh/h)	59	12	18	634	528	41
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	76	15	20	704	574	45
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1350	606	624			
vC1, stage 1 conf vol	602					
vC2, stage 2 conf vol	749					
vCu, unblocked vol	1350	606	624			
tC, single (s)	6.6	6.2	4.1			
tC, 2 stage (s)	5.6					
tF (s)	3.7	3.3	2.2			
p0 queue free %	78	97	98			
cM capacity (veh/h)	341	492	953			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	91	20	704	619
Volume Left	76	20	0	0
Volume Right	15	0	0	45
cSH	359	953	1700	1700
Volume to Capacity	0.25	0.02	0.41	0.36
Queue Length 95th (m)	7.5	0.5	0.0	0.0
Control Delay (s)	18.4	8.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	18.4	0.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		



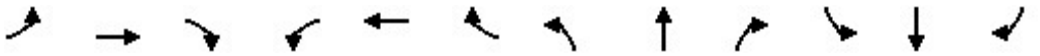
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	68	29	13	55	11	32	401	7	16	348	46
Future Volume (vph)	56	68	29	13	55	11	32	401	7	16	348	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.98	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1828	1554		1821		1786	1878		1786	1845	
Flt Permitted		0.85	1.00		0.92		0.49	1.00		0.49	1.00	
Satd. Flow (perm)		1594	1554		1685		922	1878		926	1845	
Peak-hour factor, PHF	0.88	0.88	0.88	0.80	0.80	0.80	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	64	77	33	16	69	14	35	436	8	18	395	52
RTOR Reduction (vph)	0	0	28	0	9	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	141	5	0	90	0	35	443	0	18	442	0
Confl. Peds. (#/hr)	10		5	5		10	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		10.1	10.1		10.1		48.2	48.2		48.2	48.2	
Effective Green, g (s)		10.1	10.1		10.1		48.2	48.2		48.2	48.2	
Actuated g/C Ratio		0.14	0.14		0.14		0.69	0.69		0.69	0.69	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		229	223		242		632	1287		634	1264	
v/s Ratio Prot								0.24			c0.24	
v/s Ratio Perm		c0.09	0.00		0.05		0.04			0.02		
v/c Ratio		0.62	0.02		0.37		0.06	0.34		0.03	0.35	
Uniform Delay, d1		28.3	25.9		27.2		3.6	4.5		3.5	4.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.9	0.0		1.0		0.2	0.7		0.1	0.8	
Delay (s)		33.1	25.9		28.2		3.8	5.3		3.6	5.3	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		31.8			28.2			5.2			5.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	159	84	72	198	131	64	327	46	111	354	71
Future Volume (vph)	83	159	84	72	198	131	64	327	46	111	354	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.98			0.98			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.95			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3331			3299			3473			3437	
Flt Permitted		0.61			0.76			0.77			0.73	
Satd. Flow (perm)		2064			2526			2696			2546	
Peak-hour factor, PHF	0.82	0.82	0.82	0.68	0.68	0.68	0.90	0.90	0.90	0.76	0.76	0.76
Adj. Flow (vph)	101	194	102	106	291	193	71	363	51	146	466	93
RTOR Reduction (vph)	0	43	0	0	75	0	0	7	0	0	12	0
Lane Group Flow (vph)	0	354	0	0	515	0	0	478	0	0	693	0
Confl. Peds. (#/hr)	50		60	60		50	60		50	50		60
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.9			20.9			46.2			46.2	
Effective Green, g (s)		20.9			20.9			46.2			46.2	
Actuated g/C Ratio		0.26			0.26			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		545			667			1574			1487	
v/s Ratio Prot												
v/s Ratio Perm		0.17			c0.20			0.18			c0.27	
v/c Ratio		0.65			0.77			0.30			0.47	
Uniform Delay, d1		25.8			26.9			8.3			9.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.7			5.5			0.5			0.2	
Delay (s)		28.5			32.4			8.8			9.6	
Level of Service		C			C			A			A	
Approach Delay (s)		28.5			32.4			8.8			9.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	79.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	124.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

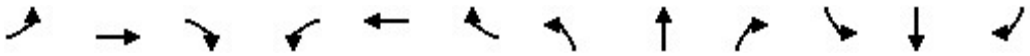
Appendix E –
Synchro Analysis Output –
Background Traffic Volumes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	12	33	5	7	16	19	461	2	20	623	11
Future Volume (Veh/h)	12	12	33	5	7	16	19	461	2	20	623	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.57	0.57	0.57	0.78	0.78	0.78	0.77	0.77	0.77
Hourly flow rate (vph)	15	15	41	9	12	28	24	591	3	26	809	14
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1561	1530	831	1565	1536	612	833			604		
vC1, stage 1 conf vol	878	878		650	650							
vC2, stage 2 conf vol	683	652		914	885							
vCu, unblocked vol	1561	1530	831	1565	1536	612	833			604		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	94	95	89	96	96	94	97			97		
cM capacity (veh/h)	249	283	364	217	275	483	759			931		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	71	49	24	594	26	823
Volume Left	15	9	24	0	26	0
Volume Right	41	28	0	3	0	14
cSH	314	342	759	1700	931	1700
Volume to Capacity	0.23	0.14	0.03	0.35	0.03	0.48
Queue Length 95th (m)	6.5	3.8	0.7	0.0	0.7	0.0
Control Delay (s)	19.8	17.3	9.9	0.0	9.0	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	19.8	17.3	0.4		0.3	
Approach LOS	C	C				

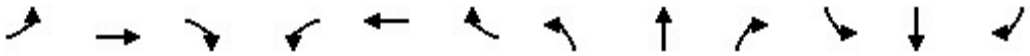
Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	46.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	22	12	7	27	5	5	128	7	2	188	5
Future Volume (Veh/h)	5	22	12	7	27	5	5	128	7	2	188	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.59	0.59	0.67	0.67	0.67	0.81	0.81	0.81	0.65	0.65	0.65
Hourly flow rate (vph)	8	37	20	10	40	7	6	158	9	3	289	8
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	510	488	303	522	488	172	302			172		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	510	488	303	522	488	172	302			172		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	92	97	98	92	99	100			100		
cM capacity (veh/h)	430	464	730	415	472	863	1253			1398		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	65	57	173	300
Volume Left	8	10	6	3
Volume Right	20	7	9	8
cSH	517	488	1253	1398
Volume to Capacity	0.13	0.12	0.00	0.00
Queue Length 95th (m)	3.3	3.0	0.1	0.0
Control Delay (s)	13.0	13.4	0.3	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	13.0	13.4	0.3	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	22.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	36	16	48	70	26	11	83	38	14	120	11
Future Volume (vph)	4	36	16	48	70	26	11	83	38	14	120	11
Peak Hour Factor	0.78	0.78	0.78	0.63	0.63	1.00	0.70	0.70	0.70	0.57	0.57	0.57
Hourly flow rate (vph)	5	46	21	76	111	26	16	119	54	25	211	19

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	72	213	189	255
Volume Left (vph)	5	76	16	25
Volume Right (vph)	21	26	54	19
Hadj (s)	-0.13	0.20	-0.08	0.03
Departure Headway (s)	5.3	5.4	5.0	5.0
Degree Utilization, x	0.11	0.32	0.26	0.35
Capacity (veh/h)	606	623	675	680
Control Delay (s)	8.9	10.8	9.7	10.7
Approach Delay (s)	8.9	10.8	9.7	10.7
Approach LOS	A	B	A	B

Intersection Summary				
Delay	10.3			
Level of Service	B			
Intersection Capacity Utilization	32.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	51	43	493	28	24	646
Future Volume (Veh/h)	51	43	493	28	24	646
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.61	0.61	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	84	70	616	35	28	743
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1448	648			661	
vC1, stage 1 conf vol	644					
vC2, stage 2 conf vol	804					
vCu, unblocked vol	1448	648			661	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	85			97	
cM capacity (veh/h)	346	463			918	

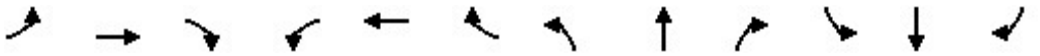
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	154	651	28	743
Volume Left	84	0	28	0
Volume Right	70	35	0	0
cSH	391	1700	918	1700
Volume to Capacity	0.39	0.38	0.03	0.44
Queue Length 95th (m)	13.9	0.0	0.7	0.0
Control Delay (s)	20.1	0.0	9.0	0.0
Lane LOS	C		A	
Approach Delay (s)	20.1	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	24	20	480	642	49
Future Volume (Veh/h)	39	24	20	480	642	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.48	0.48	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	81	50	25	600	738	56
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1426	776	799			
vC1, stage 1 conf vol	771					
vC2, stage 2 conf vol	655					
vCu, unblocked vol	1426	776	799			
tC, single (s)	6.4	6.3	4.2			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4	2.3			
p0 queue free %	77	87	97			
cM capacity (veh/h)	355	378	769			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	131	25	600	794
Volume Left	81	25	0	0
Volume Right	50	0	0	56
cSH	363	769	1700	1700
Volume to Capacity	0.36	0.03	0.35	0.47
Queue Length 95th (m)	12.2	0.8	0.0	0.0
Control Delay (s)	20.4	9.8	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	20.4	0.4		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

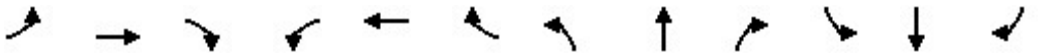


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	23	47	4	37	12	14	284	5	8	328	38
Future Volume (vph)	36	23	47	4	37	12	14	284	5	8	328	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.97	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1804	1555		1800		1785	1878		1785	1850	
Flt Permitted		0.77	1.00		0.97		0.53	1.00		0.55	1.00	
Satd. Flow (perm)		1435	1555		1747		999	1878		1034	1850	
Peak-hour factor, PHF	0.78	0.78	0.78	0.76	0.76	0.76	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	46	29	60	5	49	16	17	346	6	9	349	40
RTOR Reduction (vph)	0	0	53	0	14	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	75	7	0	56	0	17	351	0	9	385	0
Confl. Peds. (#/hr)	13		5	5		13	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		7.6	7.6		7.6		48.0	48.0		48.0	48.0	
Effective Green, g (s)		7.6	7.6		7.6		48.0	48.0		48.0	48.0	
Actuated g/C Ratio		0.11	0.11		0.11		0.71	0.71		0.71	0.71	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		161	174		196		709	1333		734	1313	
v/s Ratio Prot								0.19			c0.21	
v/s Ratio Perm		c0.05	0.00		0.03		0.02			0.01		
v/c Ratio		0.47	0.04		0.28		0.02	0.26		0.01	0.29	
Uniform Delay, d1		28.1	26.7		27.5		2.9	3.5		2.9	3.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1	0.1		0.8		0.1	0.5		0.0	0.6	
Delay (s)		30.2	26.8		28.3		3.0	4.0		2.9	4.2	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		28.7			28.3			3.9			4.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	110	99	88	160	154	50	308	52	91	368	64
Future Volume (vph)	43	110	99	88	160	154	50	308	52	91	368	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.94			0.94			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3294			3288			3471			3462	
Flt Permitted		0.67			0.76			0.81			0.76	
Satd. Flow (perm)		2209			2537			2820			2668	
Peak-hour factor, PHF	0.70	0.70	0.70	0.74	0.74	0.74	0.81	0.81	0.81	0.78	0.78	0.78
Adj. Flow (vph)	61	157	141	119	216	208	62	380	64	117	472	82
RTOR Reduction (vph)	0	109	0	0	128	0	0	9	0	0	10	0
Lane Group Flow (vph)	0	250	0	0	415	0	0	497	0	0	661	0
Confl. Peds. (#/hr)	25		25	25		25	35		35	35		35
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		17.4			17.4			46.2			46.2	
Effective Green, g (s)		17.4			17.4			46.2			46.2	
Actuated g/C Ratio		0.23			0.23			0.61			0.61	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		508			583			1723			1630	
v/s Ratio Prot												
v/s Ratio Perm		0.11			c0.16			0.18			c0.25	
v/c Ratio		0.49			0.71			0.29			0.41	
Uniform Delay, d1		25.3			26.8			6.9			7.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			4.1			0.4			0.2	
Delay (s)		26.0			30.9			7.4			7.8	
Level of Service		C			C			A			A	
Approach Delay (s)		26.0			30.9			7.4			7.8	
Approach LOS		C			C			A			A	

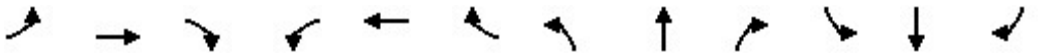
Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	75.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	116.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	11	12	15	3	18	28	646	9	34	521	15
Future Volume (Veh/h)	8	11	12	15	3	18	28	646	9	34	521	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.90	0.90	0.90	0.92	0.92	0.92
Hourly flow rate (vph)	10	13	14	19	4	23	31	718	10	37	566	16
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1473	1458	589	1460	1461	743	592			738		
vC1, stage 1 conf vol	658	658		795	795							
vC2, stage 2 conf vol	815	800		666	666							
vCu, unblocked vol	1473	1458	589	1460	1461	743	592			738		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.3	5.5							
tF (s)	3.5	4.0	3.3	3.7	4.0	3.3	2.2			2.2		
p0 queue free %	96	95	97	93	99	94	97			96		
cM capacity (veh/h)	251	285	501	254	293	407	974			846		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	37	46	31	728	37	582
Volume Left	10	19	31	0	37	0
Volume Right	14	23	0	10	0	16
cSH	326	317	974	1700	846	1700
Volume to Capacity	0.11	0.14	0.03	0.43	0.04	0.34
Queue Length 95th (m)	2.9	3.8	0.7	0.0	1.0	0.0
Control Delay (s)	17.4	18.3	8.8	0.0	9.4	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	17.4	18.3	0.4		0.6	
Approach LOS	C	C				

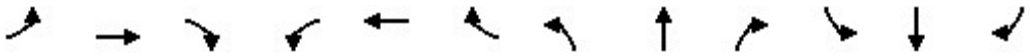
Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	47.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	27	21	3	24	6	11	166	9	2	96	2
Future Volume (Veh/h)	5	27	21	3	24	6	11	166	9	2	96	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.77	0.77	0.77	0.70	0.70	0.70
Hourly flow rate (vph)	7	36	28	3	27	7	14	216	12	3	137	3
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	425	410	148	450	406	232	145			233		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425	410	148	450	406	232	145			233		
tC, single (s)	7.1	6.6	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	99	93	97	99	95	99	99			100		
cM capacity (veh/h)	500	514	889	463	506	799	1430			1328		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	71	37	242	143
Volume Left	7	3	14	3
Volume Right	28	7	12	3
cSH	614	540	1430	1328
Volume to Capacity	0.12	0.07	0.01	0.00
Queue Length 95th (m)	3.0	1.7	0.2	0.1
Control Delay (s)	11.6	12.2	0.5	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	11.6	12.2	0.5	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	27.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	70	5	36	104	19	15	104	43	15	61	5
Future Volume (vph)	5	70	5	36	104	19	15	104	43	15	61	5
Peak Hour Factor	0.63	0.63	0.63	0.72	0.72	0.72	0.72	0.72	0.72	0.62	0.62	0.62
Hourly flow rate (vph)	8	111	8	50	144	26	21	144	60	24	98	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	127	220	225	130
Volume Left (vph)	8	50	21	24
Volume Right (vph)	8	26	60	8
Hadj (s)	0.01	0.01	-0.11	0.03
Departure Headway (s)	5.1	5.0	4.9	5.2
Degree Utilization, x	0.18	0.31	0.31	0.19
Capacity (veh/h)	636	667	687	636
Control Delay (s)	9.3	10.2	10.0	9.3
Approach Delay (s)	9.3	10.2	10.0	9.3
Approach LOS	A	B	B	A

Intersection Summary				
Delay	9.8			
Level of Service	A			
Intersection Capacity Utilization	32.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	49	67	663	57	27	540
Future Volume (Veh/h)	49	67	663	57	27	540
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	55	75	737	63	29	587
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1428	784			810	
vC1, stage 1 conf vol	778					
vC2, stage 2 conf vol	650					
vCu, unblocked vol	1428	784			810	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	81			96	
cM capacity (veh/h)	352	388			808	

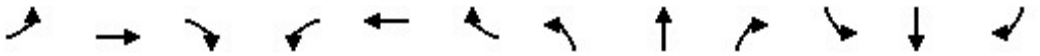
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	130	800	29	587
Volume Left	55	0	29	0
Volume Right	75	63	0	0
cSH	372	1700	808	1700
Volume to Capacity	0.35	0.47	0.04	0.35
Queue Length 95th (m)	11.7	0.0	0.8	0.0
Control Delay (s)	19.8	0.0	9.6	0.0
Lane LOS	C		A	
Approach Delay (s)	19.8	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	12	19	659	547	42
Future Volume (Veh/h)	61	12	19	659	547	42
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	78	15	21	732	595	46
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1402	628	646			
vC1, stage 1 conf vol	623					
vC2, stage 2 conf vol	779					
vCu, unblocked vol	1402	628	646			
tC, single (s)	6.6	6.2	4.1			
tC, 2 stage (s)	5.6					
tF (s)	3.7	3.3	2.2			
p0 queue free %	76	97	98			
cM capacity (veh/h)	329	478	935			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	93	21	732	641
Volume Left	78	21	0	0
Volume Right	15	0	0	46
cSH	346	935	1700	1700
Volume to Capacity	0.27	0.02	0.43	0.38
Queue Length 95th (m)	8.1	0.5	0.0	0.0
Control Delay (s)	19.2	8.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.2	0.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

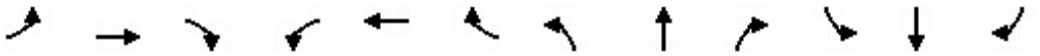


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	70	30	13	57	11	33	419	7	16	362	47
Future Volume (vph)	58	70	30	13	57	11	33	419	7	16	362	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.98	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1829	1554		1822		1786	1878		1786	1846	
Flt Permitted		0.85	1.00		0.92		0.48	1.00		0.48	1.00	
Satd. Flow (perm)		1593	1554		1688		899	1878		900	1846	
Peak-hour factor, PHF	0.88	0.88	0.88	0.80	0.80	0.80	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	66	80	34	16	71	14	36	455	8	18	411	53
RTOR Reduction (vph)	0	0	29	0	9	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	146	5	0	92	0	36	462	0	18	459	0
Confl. Peds. (#/hr)	10		5	5		10	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		10.3	10.3		10.3		47.9	47.9		47.9	47.9	
Effective Green, g (s)		10.3	10.3		10.3		47.9	47.9		47.9	47.9	
Actuated g/C Ratio		0.15	0.15		0.15		0.68	0.68		0.68	0.68	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		233	228		247		613	1281		614	1259	
v/s Ratio Prot								0.25			c0.25	
v/s Ratio Perm		c0.09	0.00		0.05		0.04			0.02		
v/c Ratio		0.63	0.02		0.37		0.06	0.36		0.03	0.36	
Uniform Delay, d1		28.1	25.6		27.0		3.7	4.7		3.6	4.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.2	0.0		1.0		0.2	0.8		0.1	0.8	
Delay (s)		33.3	25.7		28.0		3.9	5.5		3.7	5.5	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		31.9			28.0			5.4			5.5	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	70.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	167	87	77	206	138	66	337	53	120	365	73
Future Volume (vph)	86	167	87	77	206	138	66	337	53	120	365	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.98			0.98			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.95			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3332			3297			3466			3435	
Flt Permitted		0.60			0.75			0.76			0.72	
Satd. Flow (perm)		2029			2484			2664			2507	
Peak-hour factor, PHF	0.82	0.82	0.82	0.68	0.68	0.68	0.90	0.90	0.90	0.76	0.76	0.76
Adj. Flow (vph)	105	204	106	113	303	203	73	374	59	158	480	96
RTOR Reduction (vph)	0	43	0	0	74	0	0	9	0	0	12	0
Lane Group Flow (vph)	0	372	0	0	545	0	0	497	0	0	722	0
Confl. Peds. (#/hr)	50		60	60		50	60		50	50		60
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.2			22.2			46.2			46.2	
Effective Green, g (s)		22.2			22.2			46.2			46.2	
Actuated g/C Ratio		0.28			0.28			0.57			0.57	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		560			685			1530			1440	
v/s Ratio Prot												
v/s Ratio Perm		0.18			c0.22			0.19			c0.29	
v/c Ratio		0.66			0.80			0.33			0.50	
Uniform Delay, d1		25.8			27.0			8.9			10.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.0			6.4			0.6			0.3	
Delay (s)		28.8			33.4			9.5			10.5	
Level of Service		C			C			A			B	
Approach Delay (s)		28.8			33.4			9.5			10.5	
Approach LOS		C			C			A			B	

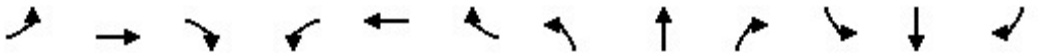
Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	14.0
Intersection Capacity Utilization	124.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	14	38	6	8	19	22	535	2	23	722	13
Future Volume (Veh/h)	14	14	38	6	8	19	22	535	2	23	722	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.57	0.57	0.57	0.78	0.78	0.78	0.77	0.77	0.77
Hourly flow rate (vph)	18	18	48	11	14	33	28	686	3	30	938	17
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1808	1772	962	1814	1778	708	965			699		
vC1, stage 1 conf vol	1016	1016		754	754							
vC2, stage 2 conf vol	792	755		1060	1025							
vCu, unblocked vol	1808	1772	962	1814	1778	708	965			699		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	91	92	84	93	94	92	96			97		
cM capacity (veh/h)	200	238	306	161	228	427	676			857		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	84	58	28	689	30	955
Volume Left	18	11	28	0	30	0
Volume Right	48	33	0	3	0	17
cSH	261	280	676	1700	857	1700
Volume to Capacity	0.32	0.21	0.04	0.41	0.03	0.56
Queue Length 95th (m)	10.2	5.8	1.0	0.0	0.8	0.0
Control Delay (s)	25.3	21.2	10.6	0.0	9.4	0.0
Lane LOS	D	C	B		A	
Approach Delay (s)	25.3	21.2	0.4		0.3	
Approach LOS	D	C				

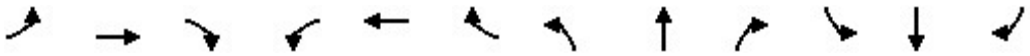
Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	52.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	25	14	8	31	6	6	148	8	2	218	6
Future Volume (Veh/h)	6	25	14	8	31	6	6	148	8	2	218	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.59	0.59	0.67	0.67	0.67	0.81	0.81	0.81	0.65	0.65	0.65
Hourly flow rate (vph)	10	42	24	12	46	9	7	183	10	3	335	9
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	590	562	350	602	562	198	349			198		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	590	562	350	602	562	198	349			198		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	90	97	97	89	99	99			100		
cM capacity (veh/h)	372	420	687	358	428	835	1204			1368		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	76	67	200	347
Volume Left	10	12	7	3
Volume Right	24	9	10	9
cSH	470	442	1204	1368
Volume to Capacity	0.16	0.15	0.01	0.00
Queue Length 95th (m)	4.4	4.0	0.1	0.1
Control Delay (s)	14.1	14.6	0.3	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	14.1	14.6	0.3	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	24.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	42	19	56	81	30	13	97	44	17	139	13
Future Volume (vph)	5	42	19	56	81	30	13	97	44	17	139	13
Peak Hour Factor	0.78	0.78	0.78	0.63	0.63	1.00	0.70	0.70	0.70	0.57	0.57	0.57
Hourly flow rate (vph)	6	54	24	89	129	30	19	139	63	30	244	23

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	248	221	297
Volume Left (vph)	6	89	19	30
Volume Right (vph)	24	30	63	23
Hadj (s)	-0.12	0.21	-0.08	0.03
Departure Headway (s)	5.6	5.6	5.3	5.3
Degree Utilization, x	0.13	0.39	0.32	0.43
Capacity (veh/h)	554	590	626	646
Control Delay (s)	9.5	12.2	10.8	12.2
Approach Delay (s)	9.5	12.2	10.8	12.2
Approach LOS	A	B	B	B

Intersection Summary				
Delay	11.6			
Level of Service	B			
Intersection Capacity Utilization	35.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	58	50	571	33	27	748
Future Volume (Veh/h)	58	50	571	33	27	748
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.61	0.61	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	95	82	714	41	31	860
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1672	750			765	
vC1, stage 1 conf vol	744					
vC2, stage 2 conf vol	927					
vCu, unblocked vol	1672	750			765	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	80			96	
cM capacity (veh/h)	298	406			840	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	177	755	31	860
Volume Left	95	0	31	0
Volume Right	82	41	0	0
cSH	340	1700	840	1700
Volume to Capacity	0.52	0.44	0.04	0.51
Queue Length 95th (m)	21.8	0.0	0.9	0.0
Control Delay (s)	26.6	0.0	9.5	0.0
Lane LOS	D		A	
Approach Delay (s)	26.6	0.0	0.3	
Approach LOS	D			

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	27	23	559	750	56
Future Volume (Veh/h)	45	27	23	559	750	56
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.48	0.48	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	94	56	29	699	862	64
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1661	904	931			
vC1, stage 1 conf vol	899					
vC2, stage 2 conf vol	762					
vCu, unblocked vol	1661	904	931			
tC, single (s)	6.4	6.3	4.2			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4	2.3			
p0 queue free %	69	82	96			
cM capacity (veh/h)	303	318	685			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	150	29	699	926
Volume Left	94	29	0	0
Volume Right	56	0	0	64
cSH	309	685	1700	1700
Volume to Capacity	0.49	0.04	0.41	0.54
Queue Length 95th (m)	19.1	1.0	0.0	0.0
Control Delay (s)	27.2	10.5	0.0	0.0
Lane LOS	D	B		
Approach Delay (s)	27.2	0.4		0.0
Approach LOS	D			

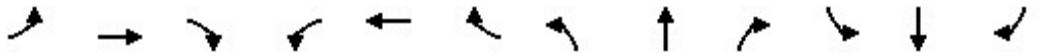
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	26	55	5	43	14	17	330	6	10	380	44
Future Volume (vph)	42	26	55	5	43	14	17	330	6	10	380	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.97	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803	1555		1802		1786	1878		1785	1849	
Flt Permitted		0.77	1.00		0.96		0.49	1.00		0.52	1.00	
Satd. Flow (perm)		1437	1555		1737		930	1878		981	1849	
Peak-hour factor, PHF	0.78	0.78	0.78	0.76	0.76	0.76	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	54	33	71	7	57	18	21	402	7	11	404	47
RTOR Reduction (vph)	0	0	63	0	16	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	87	8	0	66	0	21	408	0	11	447	0
Confl. Peds. (#/hr)	13		5	5		13	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		8.1	8.1		8.1		48.1	48.1		48.1	48.1	
Effective Green, g (s)		8.1	8.1		8.1		48.1	48.1		48.1	48.1	
Actuated g/C Ratio		0.12	0.12		0.12		0.71	0.71		0.71	0.71	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		170	184		206		655	1324		691	1304	
v/s Ratio Prot								0.22			c0.24	
v/s Ratio Perm		c0.06	0.01		0.04		0.02			0.01		
v/c Ratio		0.51	0.05		0.32		0.03	0.31		0.02	0.34	
Uniform Delay, d1		28.2	26.6		27.5		3.0	3.8		3.0	3.9	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.6	0.1		0.9		0.1	0.6		0.0	0.7	
Delay (s)		30.8	26.7		28.4		3.1	4.4		3.0	4.6	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		29.0			28.4			4.3			4.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	68.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	128	115	102	185	178	59	357	61	105	427	74
Future Volume (vph)	50	128	115	102	185	178	59	357	61	105	427	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.94			0.94			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3293			3287			3470			3462	
Flt Permitted		0.64			0.72			0.77			0.73	
Satd. Flow (perm)		2113			2408			2694			2543	
Peak-hour factor, PHF	0.70	0.70	0.70	0.74	0.74	0.74	0.81	0.81	0.81	0.78	0.78	0.78
Adj. Flow (vph)	71	183	164	138	250	241	73	441	75	135	547	95
RTOR Reduction (vph)	0	120	0	0	122	0	0	10	0	0	11	0
Lane Group Flow (vph)	0	298	0	0	507	0	0	579	0	0	766	0
Confl. Peds. (#/hr)	25		25	25		25	35		35	35		35
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.3			21.3			46.2			46.2	
Effective Green, g (s)		21.3			21.3			46.2			46.2	
Actuated g/C Ratio		0.27			0.27			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		566			645			1565			1477	
v/s Ratio Prot												
v/s Ratio Perm		0.14			c0.21			0.22			c0.30	
v/c Ratio		0.53			0.79			0.37			0.52	
Uniform Delay, d1		24.8			27.0			8.9			10.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			6.3			0.7			0.3	
Delay (s)		25.7			33.3			9.6			10.3	
Level of Service		C			C			A			B	
Approach Delay (s)		25.7			33.3			9.6			10.3	
Approach LOS		C			C			A			B	

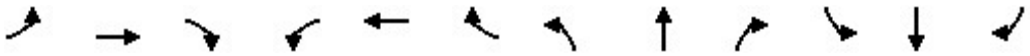
Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	117.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	13	14	18	4	20	32	748	11	39	604	18
Future Volume (Veh/h)	10	13	14	18	4	20	32	748	11	39	604	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.90	0.90	0.90	0.92	0.92	0.92
Hourly flow rate (vph)	12	16	17	23	5	26	36	831	12	42	657	20
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1702	1686	682	1690	1690	857	687			853		
vC1, stage 1 conf vol	761	761		919	919							
vC2, stage 2 conf vol	942	925		771	771							
vCu, unblocked vol	1702	1686	682	1690	1690	857	687			853		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.3	5.5							
tF (s)	3.5	4.0	3.3	3.7	4.0	3.3	2.2			2.2		
p0 queue free %	94	93	96	89	98	93	96			95		
cM capacity (veh/h)	199	239	443	206	248	350	898			766		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	45	54	36	843	42	677
Volume Left	12	23	36	0	42	0
Volume Right	17	26	0	12	0	20
cSH	272	262	898	1700	766	1700
Volume to Capacity	0.17	0.21	0.04	0.50	0.05	0.40
Queue Length 95th (m)	4.4	5.8	1.0	0.0	1.3	0.0
Control Delay (s)	20.9	22.3	9.2	0.0	10.0	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	20.9	22.3	0.4		0.6	
Approach LOS	C	C				

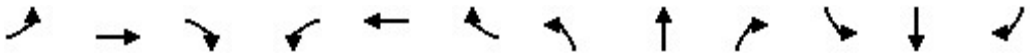
Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	53.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	31	24	4	27	7	13	192	11	2	111	2
Future Volume (Veh/h)	6	31	24	4	27	7	13	192	11	2	111	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.77	0.77	0.77	0.70	0.70	0.70
Hourly flow rate (vph)	8	41	32	5	31	8	17	249	14	3	159	3
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	490	474	170	519	468	266	167			268		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	490	474	170	519	468	266	167			268		
tC, single (s)	7.1	6.6	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	98	91	96	99	93	99	99			100		
cM capacity (veh/h)	446	472	865	409	465	765	1404			1289		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	81	44	280	165
Volume Left	8	5	17	3
Volume Right	32	8	14	3
cSH	571	493	1404	1289
Volume to Capacity	0.14	0.09	0.01	0.00
Queue Length 95th (m)	3.7	2.2	0.3	0.1
Control Delay (s)	12.3	13.0	0.6	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	12.3	13.0	0.6	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	30.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	81	6	42	121	22	18	121	50	18	71	6
Future Volume (vph)	6	81	6	42	121	22	18	121	50	18	71	6
Peak Hour Factor	0.63	0.63	0.63	0.72	0.72	0.72	0.72	0.72	0.72	0.62	0.62	0.62
Hourly flow rate (vph)	10	129	10	58	168	31	25	168	69	29	115	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	149	257	262	154
Volume Left (vph)	10	58	25	29
Volume Right (vph)	10	31	69	10
Hadj (s)	0.01	0.01	-0.10	0.03
Departure Headway (s)	5.5	5.3	5.2	5.5
Degree Utilization, x	0.23	0.38	0.38	0.23
Capacity (veh/h)	594	632	640	596
Control Delay (s)	10.1	11.5	11.3	10.2
Approach Delay (s)	10.1	11.5	11.3	10.2
Approach LOS	B	B	B	B

Intersection Summary				
Delay	10.9			
Level of Service	B			
Intersection Capacity Utilization	35.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	78	769	66	31	626
Future Volume (Veh/h)	57	78	769	66	31	626
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	64	88	854	73	34	680
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1654	906			937	
vC1, stage 1 conf vol	900					
vC2, stage 2 conf vol	753					
vCu, unblocked vol	1654	906			937	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	73			95	
cM capacity (veh/h)	303	330			724	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	152	927	34	680
Volume Left	64	0	34	0
Volume Right	88	73	0	0
cSH	318	1700	724	1700
Volume to Capacity	0.48	0.55	0.05	0.40
Queue Length 95th (m)	18.7	0.0	1.1	0.0
Control Delay (s)	26.3	0.0	10.2	0.0
Lane LOS	D		B	
Approach Delay (s)	26.3	0.0	0.5	
Approach LOS	D			

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	71	14	22	764	634	49
Future Volume (Veh/h)	71	14	22	764	634	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	91	18	24	849	689	53
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1622	726	747			
vC1, stage 1 conf vol	720					
vC2, stage 2 conf vol	902					
vCu, unblocked vol	1622	726	747			
tC, single (s)	6.6	6.2	4.1			
tC, 2 stage (s)	5.6					
tF (s)	3.7	3.3	2.2			
p0 queue free %	68	96	97			
cM capacity (veh/h)	282	421	857			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	109	24	849	742
Volume Left	91	24	0	0
Volume Right	18	0	0	53
cSH	298	857	1700	1700
Volume to Capacity	0.37	0.03	0.50	0.44
Queue Length 95th (m)	12.3	0.7	0.0	0.0
Control Delay (s)	23.9	9.3	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	23.9	0.3		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	81	35	16	66	13	38	485	8	19	419	55
Future Volume (vph)	67	81	35	16	66	13	38	485	8	19	419	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.98	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1829	1554		1822		1786	1878		1786	1845	
Flt Permitted		0.83	1.00		0.92		0.42	1.00		0.42	1.00	
Satd. Flow (perm)		1562	1554		1686		782	1878		786	1845	
Peak-hour factor, PHF	0.88	0.88	0.88	0.80	0.80	0.80	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	76	92	40	20	82	16	41	527	9	22	476	62
RTOR Reduction (vph)	0	0	33	0	8	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	168	7	0	111	0	41	535	0	22	534	0
Confl. Peds. (#/hr)	10		5	5		10	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		12.8	12.8		12.8		45.1	45.1		45.1	45.1	
Effective Green, g (s)		12.8	12.8		12.8		45.1	45.1		45.1	45.1	
Actuated g/C Ratio		0.18	0.18		0.18		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		286	284		308		504	1211		507	1190	
v/s Ratio Prot								0.29			c0.29	
v/s Ratio Perm		c0.11	0.00		0.07		0.05			0.03		
v/c Ratio		0.59	0.03		0.36		0.08	0.44		0.04	0.45	
Uniform Delay, d1		26.1	23.4		25.0		4.6	6.2		4.5	6.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.1	0.0		0.7		0.3	1.2		0.2	1.2	
Delay (s)		29.2	23.5		25.7		5.0	7.3		4.7	7.4	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		28.1			25.7			7.2			7.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	193	100	89	239	160	77	391	61	139	423	85
Future Volume (vph)	99	193	100	89	239	160	77	391	61	139	423	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.98			0.98			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.95			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3332			3296			3466			3435	
Flt Permitted		0.57			0.71			0.71			0.69	
Satd. Flow (perm)		1921			2372			2472			2382	
Peak-hour factor, PHF	0.82	0.82	0.82	0.68	0.68	0.68	0.90	0.90	0.90	0.76	0.76	0.76
Adj. Flow (vph)	121	235	122	131	351	235	86	434	68	183	557	112
RTOR Reduction (vph)	0	40	0	0	71	0	0	9	0	0	13	0
Lane Group Flow (vph)	0	438	0	0	646	0	0	579	0	0	839	0
Confl. Peds. (#/hr)	50		60	60		50	60		50	50		60
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		26.1			26.1			46.1			46.1	
Effective Green, g (s)		26.1			26.1			46.1			46.1	
Actuated g/C Ratio		0.31			0.31			0.55			0.55	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		595			735			1353			1304	
v/s Ratio Prot												
v/s Ratio Perm		0.23			c0.27			0.23			c0.35	
v/c Ratio		0.74			0.88			0.43			0.64	
Uniform Delay, d1		26.0			27.6			11.3			13.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.7			11.6			1.0			1.1	
Delay (s)		30.7			39.1			12.2			14.4	
Level of Service		C			D			B			B	
Approach Delay (s)		30.7			39.1			12.2			14.4	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	84.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	125.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Appendix F –
Transportation Tomorrow Survey – Excerpt

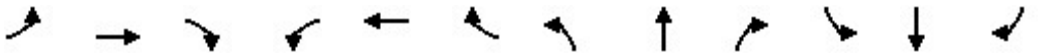
2006 GTA Zone of Origin: 8682

Outside Orillia Planning District		Distribution N	S	E	W	Total
PD 4 of Toronto	10	4	6			10
PD 6 of Toronto	20	8	12			20
Newmarket	28	11.2	16.8			28
Vaughan	7	2.8	4.2			7
Barrie	483	193.2	289.8			483
Bradford-West Gwillimbury	15	6	9			15
Essa	14	5.6	8.4			14
Kawartha Lakes	43		43			43
Hastings	8		8			8
Muskoka	116	116				116
Midland	44		44			44
Oro-Medonte	186	74.4	111.6			186
Severn	373	373				373
Ramara	212		212			212
Orillia	3281					
	1559	794.2	764.8	0	0	1559
Within Orillia 2006 GTA zone of Destiantion		Distribution N	S	E	W	Total
8681	641		320.5	320.5		641
8682	1220	305	305	305	305	1220
8683	355		177.5	177.5		355
8684	787		787			787
8685	278		278			278
	3281	305	1868	803	305	3281
Totals	4840	1099.2	2632.8	803	305	4840
Distribution %		23%	54%	17%	6%	100%

```
Thu Oct 08 2020 11:07:20 GMT-0400 (Eastern Daylight Time) - Run Time: 2422ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: Planning district of destination - pd_dest


Filters:
(2006 GTA zone of origin - gta06_orig In 8682
and
Start time of trip - start_time In 600-900)

Trip 2016
ROW : gta06_orig
COLUMN : pd_dest
  gta06_orig     pd_dest      total
        8682           4         10
        8682           6         20
        8682          27         28
        8682          33          7
        8682          81        483
        8682          83         15
        8682          86         14
        8682          89         43
        8682         115          8
        8682         117        116
        8682         131         44
        8682         133        186
        8682         134        373
        8682         135        212
        8682         136       3281
        8682         998         25
```

```
Thu Oct 08 2020 11:11:43 GMT-0400 (Eastern Daylight Time) - Run Time: 2228ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest


Filters:
(2006 GTA zone of origin - gta06_orig In 8682
and
Start time of trip - start_time In 600-900
and
Planning district of destination - pd_dest In 136, )

Trip 2016
ROW : gta06_orig
COLUMN : gta06_dest
  gta06_orig  gta06_dest      total
        8682        8681        641
        8682        8682       1220
        8682        8683        355
        8682        8684        787
        8682        8685        278
```

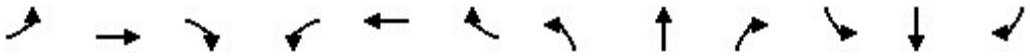
Appendix G –
Synchro Analysis Output –
Total Traffic Volumes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	12	33	5	7	16	19	498	2	20	649	11
Future Volume (Veh/h)	12	12	33	5	7	16	19	498	2	20	649	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.57	0.57	0.57	0.78	0.78	0.78	0.77	0.77	0.77
Hourly flow rate (vph)	15	15	41	9	12	28	24	638	3	26	843	14
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1642	1611	865	1646	1616	660	867			651		
vC1, stage 1 conf vol	912	912		698	698							
vC2, stage 2 conf vol	730	699		948	919							
vCu, unblocked vol	1642	1611	865	1646	1616	660	867			651		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	94	94	88	96	95	94	97			97		
cM capacity (veh/h)	233	268	348	203	261	454	737			894		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	71	49	24	641	26	857
Volume Left	15	9	24	0	26	0
Volume Right	41	28	0	3	0	14
cSH	298	323	737	1700	894	1700
Volume to Capacity	0.24	0.15	0.03	0.38	0.03	0.50
Queue Length 95th (m)	6.9	4.0	0.8	0.0	0.7	0.0
Control Delay (s)	20.8	18.1	10.1	0.0	9.1	0.0
Lane LOS	C	C	B		A	
Approach Delay (s)	20.8	18.1	0.4		0.3	
Approach LOS	C	C				

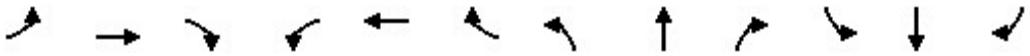
Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	47.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	22	12	7	27	12	5	137	7	7	195	5
Future Volume (Veh/h)	5	22	12	7	27	12	5	137	7	7	195	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.59	0.59	0.67	0.67	0.67	0.81	0.81	0.81	0.65	0.65	0.65
Hourly flow rate (vph)	8	37	20	10	40	18	6	169	9	11	300	8
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	560	526	314	560	526	184	313			183		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	560	526	314	560	526	184	313			183		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	92	97	97	91	98	100			99		
cM capacity (veh/h)	390	438	719	389	447	851	1241			1385		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	65	68	184	319
Volume Left	8	10	6	11
Volume Right	20	18	9	8
cSH	490	499	1241	1385
Volume to Capacity	0.13	0.14	0.00	0.01
Queue Length 95th (m)	3.5	3.6	0.1	0.2
Control Delay (s)	13.5	13.4	0.3	0.3
Lane LOS	B	B	A	A
Approach Delay (s)	13.5	13.4	0.3	0.3
Approach LOS	B	B		

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	25.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	36	20	56	70	26	14	83	44	14	120	11
Future Volume (vph)	4	36	20	56	70	26	14	83	44	14	120	11
Peak Hour Factor	0.78	0.78	0.78	0.63	0.63	1.00	0.70	0.70	0.70	0.57	0.57	0.57
Hourly flow rate (vph)	5	46	26	89	111	26	20	119	63	25	211	19

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	77	226	202	255
Volume Left (vph)	5	89	20	25
Volume Right (vph)	26	26	63	19
Hadj (s)	-0.16	0.23	-0.09	0.03
Departure Headway (s)	5.3	5.4	5.0	5.1
Degree Utilization, x	0.11	0.34	0.28	0.36
Capacity (veh/h)	597	614	666	665
Control Delay (s)	9.0	11.2	10.0	10.9
Approach Delay (s)	9.0	11.2	10.0	10.9
Approach LOS	A	B	B	B

Intersection Summary				
Delay	10.6			
Level of Service	B			
Intersection Capacity Utilization	32.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	51	46	504	28	28	662
Future Volume (Veh/h)	51	46	504	28	28	662
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.61	0.61	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	84	75	630	35	32	761
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1488	662			675	
vC1, stage 1 conf vol	658					
vC2, stage 2 conf vol	830					
vCu, unblocked vol	1488	662			675	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	84			96	
cM capacity (veh/h)	336	455			907	

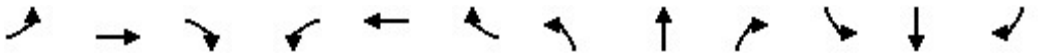
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	159	665	32	761
Volume Left	84	0	32	0
Volume Right	75	35	0	0
cSH	383	1700	907	1700
Volume to Capacity	0.42	0.39	0.04	0.45
Queue Length 95th (m)	15.1	0.0	0.8	0.0
Control Delay (s)	20.9	0.0	9.1	0.0
Lane LOS	C		A	
Approach Delay (s)	20.9	0.0	0.4	
Approach LOS	C			

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	29	24	493	642	49
Future Volume (Veh/h)	39	29	24	493	642	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.48	0.48	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	81	60	30	616	738	56
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1452	776	799			
vC1, stage 1 conf vol	771					
vC2, stage 2 conf vol	681					
vCu, unblocked vol	1452	776	799			
tC, single (s)	6.4	6.3	4.2			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4	2.3			
p0 queue free %	77	84	96			
cM capacity (veh/h)	348	378	769			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	141	30	616	794
Volume Left	81	30	0	0
Volume Right	60	0	0	56
cSH	360	769	1700	1700
Volume to Capacity	0.39	0.04	0.36	0.47
Queue Length 95th (m)	13.7	0.9	0.0	0.0
Control Delay (s)	21.3	9.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	21.3	0.5		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	23	47	4	37	12	14	321	5	8	354	38
Future Volume (vph)	36	23	47	4	37	12	14	321	5	8	354	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1804	1555		1800		1786	1878		1785	1852	
Flt Permitted		0.77	1.00		0.97		0.52	1.00		0.53	1.00	
Satd. Flow (perm)		1435	1555		1747		974	1878		992	1852	
Peak-hour factor, PHF	0.78	0.78	0.78	0.76	0.76	0.76	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	46	29	60	5	49	16	17	391	6	9	377	40
RTOR Reduction (vph)	0	0	53	0	14	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	75	7	0	56	0	17	396	0	9	414	0
Confl. Peds. (#/hr)	13		5	5		13	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		7.6	7.6		7.6		48.0	48.0		48.0	48.0	
Effective Green, g (s)		7.6	7.6		7.6		48.0	48.0		48.0	48.0	
Actuated g/C Ratio		0.11	0.11		0.11		0.71	0.71		0.71	0.71	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		161	174		196		691	1333		704	1315	
v/s Ratio Prot								0.21			c0.22	
v/s Ratio Perm		c0.05	0.00		0.03		0.02			0.01		
v/c Ratio		0.47	0.04		0.28		0.02	0.30		0.01	0.31	
Uniform Delay, d1		28.1	26.7		27.5		2.9	3.6		2.9	3.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1	0.1		0.8		0.1	0.6		0.0	0.6	
Delay (s)		30.2	26.8		28.3		3.0	4.2		2.9	4.3	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		28.7			28.3			4.1			4.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	110	99	88	160	154	50	322	52	91	388	64
Future Volume (vph)	43	110	99	88	160	154	50	322	52	91	388	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.94			0.94			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3294			3288			3475			3466	
Flt Permitted		0.67			0.76			0.81			0.76	
Satd. Flow (perm)		2209			2537			2818			2669	
Peak-hour factor, PHF	0.70	0.70	0.70	0.74	0.74	0.74	0.81	0.81	0.81	0.78	0.78	0.78
Adj. Flow (vph)	61	157	141	119	216	208	62	398	64	117	497	82
RTOR Reduction (vph)	0	109	0	0	128	0	0	8	0	0	10	0
Lane Group Flow (vph)	0	250	0	0	415	0	0	516	0	0	686	0
Confl. Peds. (#/hr)	25		25	25		25	35		35	35		35
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		17.4			17.4			46.2			46.2	
Effective Green, g (s)		17.4			17.4			46.2			46.2	
Actuated g/C Ratio		0.23			0.23			0.61			0.61	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		508			583			1722			1631	
v/s Ratio Prot												
v/s Ratio Perm		0.11			c0.16			0.18			c0.26	
v/c Ratio		0.49			0.71			0.30			0.42	
Uniform Delay, d1		25.3			26.8			7.0			7.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			4.1			0.4			0.2	
Delay (s)		26.0			30.9			7.4			7.9	
Level of Service		C			C			A			A	
Approach Delay (s)		26.0			30.9			7.4			7.9	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	75.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	116.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	26	15	502	37	21	672
Future Volume (Veh/h)	26	15	502	37	21	672
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)	28	16	546	40	23	730
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1342	566			586	
vC1, stage 1 conf vol	566					
vC2, stage 2 conf vol	776					
vCu, unblocked vol	1342	566			586	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	97			98	
cM capacity (veh/h)	373	524			989	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	44	586	23	730
Volume Left	28	0	23	0
Volume Right	16	40	0	0
cSH	416	1700	989	1700
Volume to Capacity	0.11	0.34	0.02	0.43
Queue Length 95th (m)	2.7	0.0	0.5	0.0
Control Delay (s)	14.7	0.0	8.7	0.0
Lane LOS	B		A	
Approach Delay (s)	14.7	0.0	0.3	
Approach LOS	B			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	12	16	138	195	12
Future Volume (Veh/h)	9	12	16	138	195	12
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	13	17	150	212	13
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	402	218	225			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	402	218	225			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	596	821	1344			

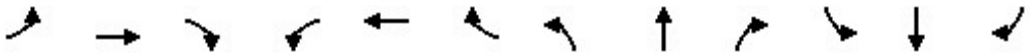
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	167	225
Volume Left	10	17	0
Volume Right	13	0	13
cSH	705	1344	1700
Volume to Capacity	0.03	0.01	0.13
Queue Length 95th (m)	0.8	0.3	0.0
Control Delay (s)	10.3	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	10.3	0.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	30.6%	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)	8	11	12	15	3	18	28	672	9	34	555	15
Future Volume (Veh/h)	8	11	12	15	3	18	28	672	9	34	555	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.90	0.90	0.90	0.92	0.92	0.92
Hourly flow rate (vph)	10	13	14	19	4	23	31	747	10	37	603	16
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1539	1524	626	1526	1527	772	629			767		
vC1, stage 1 conf vol	695	695		824	824							
vC2, stage 2 conf vol	844	829		702	703							
vCu, unblocked vol	1539	1524	626	1526	1527	772	629			767		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.3	5.5							
tF (s)	3.5	4.0	3.3	3.7	4.0	3.3	2.2			2.2		
p0 queue free %	96	95	97	92	99	94	97			96		
cM capacity (veh/h)	238	273	477	241	281	392	944			825		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	37	46	31	757	37	619
Volume Left	10	19	31	0	37	0
Volume Right	14	23	0	10	0	16
cSH	311	303	944	1700	825	1700
Volume to Capacity	0.12	0.15	0.03	0.45	0.04	0.36
Queue Length 95th (m)	3.0	4.0	0.8	0.0	1.1	0.0
Control Delay (s)	18.1	19.0	8.9	0.0	9.6	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	18.1	19.0	0.4		0.5	
Approach LOS	C	C				

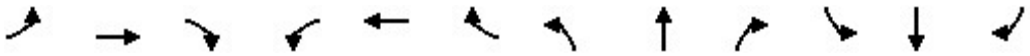
Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	49.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	27	21	3	24	11	11	172	9	8	105	2
Future Volume (Veh/h)	5	27	21	3	24	11	11	172	9	8	105	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.77	0.77	0.77	0.70	0.70	0.70
Hourly flow rate (vph)	7	36	28	3	27	13	14	223	12	11	150	3
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	467	446	162	486	442	239	158			240		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	467	446	162	486	442	239	158			240		
tC, single (s)	7.1	6.6	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	98	93	97	99	94	98	99			99		
cM capacity (veh/h)	462	487	875	435	480	792	1415			1320		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	71	43	249	164
Volume Left	7	3	14	11
Volume Right	28	13	12	3
cSH	586	540	1415	1320
Volume to Capacity	0.12	0.08	0.01	0.01
Queue Length 95th (m)	3.1	2.0	0.2	0.2
Control Delay (s)	12.0	12.2	0.5	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	12.0	12.2	0.5	0.6
Approach LOS	B	B		

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	25.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	70	8	42	104	19	19	104	51	15	61	5
Future Volume (vph)	5	70	8	42	104	19	19	104	51	15	61	5
Peak Hour Factor	0.63	0.63	0.63	0.72	0.72	0.72	0.72	0.72	0.72	0.62	0.62	0.62
Hourly flow rate (vph)	8	111	13	58	144	26	26	144	71	24	98	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	132	228	241	130
Volume Left (vph)	8	58	26	24
Volume Right (vph)	13	26	71	8
Hadj (s)	-0.01	0.02	-0.12	0.03
Departure Headway (s)	5.2	5.1	4.9	5.2
Degree Utilization, x	0.19	0.32	0.33	0.19
Capacity (veh/h)	628	657	673	625
Control Delay (s)	9.4	10.5	10.3	9.4
Approach Delay (s)	9.4	10.5	10.3	9.4
Approach LOS	A	B	B	A

Intersection Summary				
Delay	10.0			
Level of Service	B			
Intersection Capacity Utilization	34.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	49	71	678	57	30	551
Future Volume (Veh/h)	49	71	678	57	30	551
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	55	80	753	63	33	599
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1464	800			826	
vC1, stage 1 conf vol	794					
vC2, stage 2 conf vol	670					
vCu, unblocked vol	1464	800			826	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	79			96	
cM capacity (veh/h)	343	380			797	

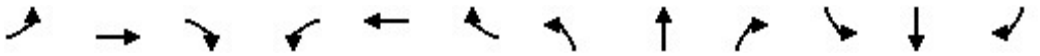
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	135	816	33	599
Volume Left	55	0	33	0
Volume Right	80	63	0	0
cSH	364	1700	797	1700
Volume to Capacity	0.37	0.48	0.04	0.35
Queue Length 95th (m)	12.7	0.0	1.0	0.0
Control Delay (s)	20.6	0.0	9.7	0.0
Lane LOS	C		A	
Approach Delay (s)	20.6	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	16	24	674	558	42
Future Volume (Veh/h)	61	16	24	674	558	42
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	78	21	27	749	607	46
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1443	640	658			
vC1, stage 1 conf vol	635					
vC2, stage 2 conf vol	808					
vCu, unblocked vol	1443	640	658			
tC, single (s)	6.6	6.2	4.1			
tC, 2 stage (s)	5.6					
tF (s)	3.7	3.3	2.2			
p0 queue free %	75	96	97			
cM capacity (veh/h)	318	471	925			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	99	27	749	653
Volume Left	78	27	0	0
Volume Right	21	0	0	46
cSH	341	925	1700	1700
Volume to Capacity	0.29	0.03	0.44	0.38
Queue Length 95th (m)	9.0	0.7	0.0	0.0
Control Delay (s)	19.8	9.0	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.8	0.3		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	70	30	13	57	11	33	445	7	16	396	47
Future Volume (vph)	58	70	30	13	57	11	33	445	7	16	396	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.98	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1829	1554		1822		1786	1878		1786	1849	
Flt Permitted		0.85	1.00		0.92		0.45	1.00		0.46	1.00	
Satd. Flow (perm)		1593	1554		1688		850	1878		864	1849	
Peak-hour factor, PHF	0.88	0.88	0.88	0.80	0.80	0.80	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	66	80	34	16	71	14	36	484	8	18	450	53
RTOR Reduction (vph)	0	0	29	0	9	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	146	5	0	92	0	36	491	0	18	499	0
Confl. Peds. (#/hr)	10		5	5		10	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		10.3	10.3		10.3		47.9	47.9		47.9	47.9	
Effective Green, g (s)		10.3	10.3		10.3		47.9	47.9		47.9	47.9	
Actuated g/C Ratio		0.15	0.15		0.15		0.68	0.68		0.68	0.68	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		233	228		247		579	1281		589	1261	
v/s Ratio Prot								0.26			c0.27	
v/s Ratio Perm		c0.09	0.00		0.05		0.04			0.02		
v/c Ratio		0.63	0.02		0.37		0.06	0.38		0.03	0.40	
Uniform Delay, d1		28.1	25.6		27.0		3.7	4.8		3.6	4.9	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.2	0.0		1.0		0.2	0.9		0.1	0.9	
Delay (s)		33.3	25.7		28.0		3.9	5.7		3.7	5.8	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		31.9			28.0			5.5			5.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	70.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	167	87	77	206	138	66	356	53	120	379	73
Future Volume (vph)	86	167	87	77	206	138	66	356	53	120	379	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.98			0.98			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.95			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3332			3297			3470			3439	
Flt Permitted		0.60			0.75			0.76			0.72	
Satd. Flow (perm)		2029			2484			2669			2492	
Peak-hour factor, PHF	0.82	0.82	0.82	0.68	0.68	0.68	0.90	0.90	0.90	0.76	0.76	0.76
Adj. Flow (vph)	105	204	106	113	303	203	73	396	59	158	499	96
RTOR Reduction (vph)	0	43	0	0	74	0	0	8	0	0	12	0
Lane Group Flow (vph)	0	372	0	0	545	0	0	520	0	0	741	0
Confl. Peds. (#/hr)	50		60	60		50	60		50	50		60
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.2			22.2			46.2			46.2	
Effective Green, g (s)		22.2			22.2			46.2			46.2	
Actuated g/C Ratio		0.28			0.28			0.57			0.57	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		560			685			1533			1431	
v/s Ratio Prot												
v/s Ratio Perm		0.18			c0.22			0.19			c0.30	
v/c Ratio		0.66			0.80			0.34			0.52	
Uniform Delay, d1		25.8			27.0			9.0			10.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.0			6.4			0.6			0.3	
Delay (s)		28.8			33.4			9.6			10.7	
Level of Service		C			C			A			B	
Approach Delay (s)		28.8			33.4			9.6			10.7	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	14.0
Intersection Capacity Utilization	124.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	20	678	26	15	559
Future Volume (Veh/h)	34	20	678	26	15	559
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)	37	22	737	28	16	608
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1391	751			765	
vC1, stage 1 conf vol	751					
vC2, stage 2 conf vol	640					
vCu, unblocked vol	1391	751			765	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	95			98	
cM capacity (veh/h)	368	411			848	

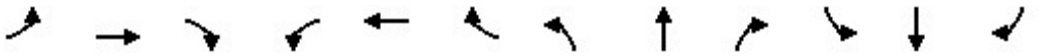
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	59	765	16	608
Volume Left	37	0	16	0
Volume Right	22	28	0	0
cSH	383	1700	848	1700
Volume to Capacity	0.15	0.45	0.02	0.36
Queue Length 95th (m)	4.1	0.0	0.4	0.0
Control Delay (s)	16.1	0.0	9.3	0.0
Lane LOS	C		A	
Approach Delay (s)	16.1	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	15	11	177	100	9
Future Volume (Veh/h)	12	15	11	177	100	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	16	12	192	109	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	330	114	119			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	330	114	119			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	659	939	1469			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	29	204	119
Volume Left	13	12	0
Volume Right	16	0	10
cSH	789	1469	1700
Volume to Capacity	0.04	0.01	0.07
Queue Length 95th (m)	0.9	0.2	0.0
Control Delay (s)	9.7	0.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.7	0.5	0.0
Approach LOS	A		

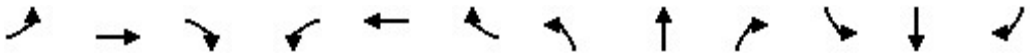
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	14	38	6	8	19	22	572	2	23	748	13
Future Volume (Veh/h)	14	14	38	6	8	19	22	572	2	23	748	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.57	0.57	0.57	0.78	0.78	0.78	0.77	0.77	0.77
Hourly flow rate (vph)	18	18	48	11	14	33	28	733	3	30	971	17
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1888	1852	994	1894	1858	754	998			746		
vC1, stage 1 conf vol	1050	1050		800	800							
vC2, stage 2 conf vol	839	802		1093	1058							
vCu, unblocked vol	1888	1852	994	1894	1858	754	998			746		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	90	92	84	93	94	92	96			96		
cM capacity (veh/h)	187	226	293	150	217	401	656			823		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	84	58	28	736	30	988
Volume Left	18	11	28	0	30	0
Volume Right	48	33	0	3	0	17
cSH	247	264	656	1700	823	1700
Volume to Capacity	0.34	0.22	0.04	0.43	0.04	0.58
Queue Length 95th (m)	10.9	6.2	1.0	0.0	0.9	0.0
Control Delay (s)	26.8	22.5	10.7	0.0	9.5	0.0
Lane LOS	D	C	B		A	
Approach Delay (s)	26.8	22.5	0.4		0.3	
Approach LOS	D	C				

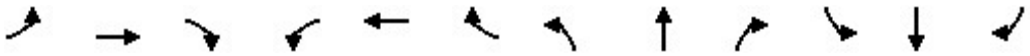
Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	53.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	25	14	8	31	13	6	157	8	7	225	6
Future Volume (Veh/h)	6	25	14	8	31	13	6	157	8	7	225	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.59	0.59	0.67	0.67	0.67	0.81	0.81	0.81	0.65	0.65	0.65
Hourly flow rate (vph)	10	42	24	12	46	19	7	194	10	11	346	9
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	638	600	360	640	600	209	360			209		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	638	600	360	640	600	209	360			209		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	89	96	96	89	98	99			99		
cM capacity (veh/h)	338	397	677	334	405	823	1193			1355		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	76	77	211	366
Volume Left	10	12	7	11
Volume Right	24	19	10	9
cSH	445	446	1193	1355
Volume to Capacity	0.17	0.17	0.01	0.01
Queue Length 95th (m)	4.6	4.7	0.1	0.2
Control Delay (s)	14.8	14.7	0.3	0.3
Lane LOS	B	B	A	A
Approach Delay (s)	14.8	14.7	0.3	0.3
Approach LOS	B	B		

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	27.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	42	23	64	81	30	16	97	50	17	139	13
Future Volume (vph)	5	42	23	64	81	30	16	97	50	17	139	13
Peak Hour Factor	0.78	0.78	0.78	0.63	0.63	1.00	0.70	0.70	0.70	0.57	0.57	0.57
Hourly flow rate (vph)	6	54	29	102	129	30	23	139	71	30	244	23

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	89	261	233	297
Volume Left (vph)	6	102	23	30
Volume Right (vph)	29	30	71	23
Hadj (s)	-0.15	0.22	-0.09	0.03
Departure Headway (s)	5.7	5.7	5.3	5.3
Degree Utilization, x	0.14	0.42	0.35	0.44
Capacity (veh/h)	545	583	618	632
Control Delay (s)	9.6	12.7	11.1	12.5
Approach Delay (s)	9.6	12.7	11.1	12.5
Approach LOS	A	B	B	B

Intersection Summary				
Delay	11.9			
Level of Service	B			
Intersection Capacity Utilization	35.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	58	53	582	33	31	764
Future Volume (Veh/h)	58	53	582	33	31	764
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.61	0.61	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	95	87	728	41	36	878
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1714	764			779	
vC1, stage 1 conf vol	758					
vC2, stage 2 conf vol	955					
vCu, unblocked vol	1714	764			779	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	67	78			96	
cM capacity (veh/h)	288	398			830	

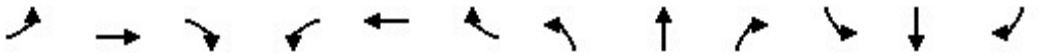
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	182	769	36	878
Volume Left	95	0	36	0
Volume Right	87	41	0	0
cSH	332	1700	830	1700
Volume to Capacity	0.55	0.45	0.04	0.52
Queue Length 95th (m)	23.7	0.0	1.0	0.0
Control Delay (s)	28.3	0.0	9.5	0.0
Lane LOS	D		A	
Approach Delay (s)	28.3	0.0	0.4	
Approach LOS	D			

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	27	27	570	766	56
Future Volume (Veh/h)	45	27	27	570	766	56
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.48	0.48	0.80	0.80	0.87	0.87
Hourly flow rate (vph)	94	56	34	713	880	64
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1703	922	949			
vC1, stage 1 conf vol	917					
vC2, stage 2 conf vol	786					
vCu, unblocked vol	1703	922	949			
tC, single (s)	6.4	6.3	4.2			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4	2.3			
p0 queue free %	68	82	95			
cM capacity (veh/h)	294	311	674			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	150	34	713	944
Volume Left	94	34	0	0
Volume Right	56	0	0	64
cSH	300	674	1700	1700
Volume to Capacity	0.50	0.05	0.42	0.56
Queue Length 95th (m)	20.0	1.2	0.0	0.0
Control Delay (s)	28.4	10.6	0.0	0.0
Lane LOS	D	B		
Approach Delay (s)	28.4	0.5		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	26	55	5	43	14	17	367	6	10	406	44
Future Volume (vph)	42	26	55	5	43	14	17	367	6	10	406	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803	1555		1802		1786	1878		1786	1851	
Flt Permitted		0.77	1.00		0.96		0.48	1.00		0.49	1.00	
Satd. Flow (perm)		1437	1555		1737		896	1878		925	1851	
Peak-hour factor, PHF	0.78	0.78	0.78	0.76	0.76	0.76	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	54	33	71	7	57	18	21	448	7	11	432	47
RTOR Reduction (vph)	0	0	63	0	16	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	87	8	0	66	0	21	454	0	11	475	0
Confl. Peds. (#/hr)	13		5	5		13	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		8.1	8.1		8.1		48.1	48.1		48.1	48.1	
Effective Green, g (s)		8.1	8.1		8.1		48.1	48.1		48.1	48.1	
Actuated g/C Ratio		0.12	0.12		0.12		0.71	0.71		0.71	0.71	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		170	184		206		631	1324		652	1305	
v/s Ratio Prot								0.24			c0.26	
v/s Ratio Perm		c0.06	0.01		0.04		0.02			0.01		
v/c Ratio		0.51	0.05		0.32		0.03	0.34		0.02	0.36	
Uniform Delay, d1		28.2	26.6		27.5		3.0	3.9		3.0	4.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.6	0.1		0.9		0.1	0.7		0.0	0.8	
Delay (s)		30.8	26.7		28.4		3.1	4.6		3.0	4.8	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		29.0			28.4			4.6			4.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	68.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	128	115	102	185	178	59	371	61	105	447	74
Future Volume (vph)	50	128	115	102	185	178	59	371	61	105	447	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.94			0.94			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3293			3287			3473			3466	
Flt Permitted		0.64			0.72			0.77			0.73	
Satd. Flow (perm)		2113			2408			2689			2537	
Peak-hour factor, PHF	0.70	0.70	0.70	0.74	0.74	0.74	0.81	0.81	0.81	0.78	0.78	0.78
Adj. Flow (vph)	71	183	164	138	250	241	73	458	75	135	573	95
RTOR Reduction (vph)	0	120	0	0	122	0	0	9	0	0	10	0
Lane Group Flow (vph)	0	298	0	0	507	0	0	597	0	0	793	0
Confl. Peds. (#/hr)	25		25	25		25	35		35	35		35
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.3			21.3			46.2			46.2	
Effective Green, g (s)		21.3			21.3			46.2			46.2	
Actuated g/C Ratio		0.27			0.27			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		566			645			1562			1474	
v/s Ratio Prot												
v/s Ratio Perm		0.14			c0.21			0.22			c0.31	
v/c Ratio		0.53			0.79			0.38			0.54	
Uniform Delay, d1		24.8			27.0			9.0			10.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			6.3			0.7			0.4	
Delay (s)		25.7			33.3			9.7			10.5	
Level of Service		C			C			A			B	
Approach Delay (s)		25.7			33.3			9.7			10.5	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	117.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	26	15	582	37	21	777
Future Volume (Veh/h)	26	15	582	37	21	777
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)	28	16	633	40	23	845
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1544	653			673	
vC1, stage 1 conf vol	653					
vC2, stage 2 conf vol	891					
vCu, unblocked vol	1544	653			673	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	97			97	
cM capacity (veh/h)	325	467			918	

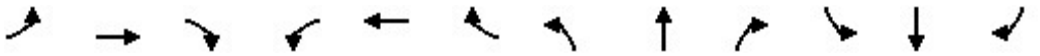
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	44	673	23	845
Volume Left	28	0	23	0
Volume Right	16	40	0	0
cSH	366	1700	918	1700
Volume to Capacity	0.12	0.40	0.03	0.50
Queue Length 95th (m)	3.1	0.0	0.6	0.0
Control Delay (s)	16.2	0.0	9.0	0.0
Lane LOS	C		A	
Approach Delay (s)	16.2	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	12	16	160	226	12
Future Volume (Veh/h)	9	12	16	160	226	12
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	13	17	174	246	13
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	460	252	259			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	460	252	259			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	552	786	1306			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	191	259
Volume Left	10	17	0
Volume Right	13	0	13
cSH	664	1306	1700
Volume to Capacity	0.03	0.01	0.15
Queue Length 95th (m)	0.8	0.3	0.0
Control Delay (s)	10.6	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	0.8	0.0
Approach LOS	B		

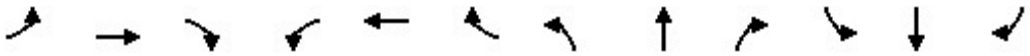
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	13	14	18	4	20	32	774	11	39	638	18
Future Volume (Veh/h)	10	13	14	18	4	20	32	774	11	39	638	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.90	0.90	0.90	0.92	0.92	0.92
Hourly flow rate (vph)	12	16	17	23	5	26	36	860	12	42	693	20
Pedestrians		10			10			5			10	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1768	1751	718	1755	1755	886	723			882		
vC1, stage 1 conf vol	797	797		948	948							
vC2, stage 2 conf vol	970	954		807	807							
vCu, unblocked vol	1768	1751	718	1755	1755	886	723			882		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.3	5.5							
tF (s)	3.5	4.0	3.3	3.7	4.0	3.3	2.2			2.2		
p0 queue free %	94	93	96	88	98	92	96			94		
cM capacity (veh/h)	188	229	423	195	238	337	871			747		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	45	54	36	872	42	713
Volume Left	12	23	36	0	42	0
Volume Right	17	26	0	12	0	20
cSH	259	250	871	1700	747	1700
Volume to Capacity	0.17	0.22	0.04	0.51	0.06	0.42
Queue Length 95th (m)	4.7	6.1	1.0	0.0	1.4	0.0
Control Delay (s)	21.8	23.4	9.3	0.0	10.1	0.0
Lane LOS	C	C	A		B	
Approach Delay (s)	21.8	23.4	0.4		0.6	
Approach LOS	C	C				

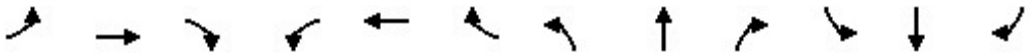
Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	31	24	4	27	12	13	198	11	8	120	2
Future Volume (Veh/h)	6	31	24	4	27	12	13	198	11	8	120	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.77	0.77	0.77	0.70	0.70	0.70
Hourly flow rate (vph)	8	41	32	5	31	14	17	257	14	11	171	3
Pedestrians		5			5			5			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	532	510	182	555	504	274	179			276		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	532	510	182	555	504	274	179			276		
tC, single (s)	7.1	6.6	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	98	91	96	99	93	98	99			99		
cM capacity (veh/h)	412	447	852	383	441	757	1390			1281		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	81	50	288	185
Volume Left	8	5	17	11
Volume Right	32	14	14	3
cSH	545	491	1390	1281
Volume to Capacity	0.15	0.10	0.01	0.01
Queue Length 95th (m)	3.9	2.6	0.3	0.2
Control Delay (s)	12.8	13.2	0.6	0.5
Lane LOS	B	B	A	A
Approach Delay (s)	12.8	13.2	0.6	0.5
Approach LOS	B	B		

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	27.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	81	9	48	121	22	22	121	58	18	71	6
Future Volume (vph)	6	81	9	48	121	22	22	121	58	18	71	6
Peak Hour Factor	0.63	0.63	0.63	0.72	0.72	0.72	0.72	0.72	0.72	0.62	0.62	0.62
Hourly flow rate (vph)	10	129	14	67	168	31	31	168	81	29	115	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	153	266	280	154
Volume Left (vph)	10	67	31	29
Volume Right (vph)	14	31	81	10
Hadj (s)	-0.01	0.01	-0.12	0.03
Departure Headway (s)	5.5	5.4	5.2	5.6
Degree Utilization, x	0.24	0.40	0.41	0.24
Capacity (veh/h)	582	622	636	582
Control Delay (s)	10.2	11.9	11.7	10.3
Approach Delay (s)	10.2	11.9	11.7	10.3
Approach LOS	B	B	B	B

Intersection Summary				
Delay	11.3			
Level of Service	B			
Intersection Capacity Utilization	37.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	82	784	66	34	637
Future Volume (Veh/h)	57	82	784	66	34	637
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	64	92	871	73	37	692
Pedestrians	10		5			5
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1688	922			954	
vC1, stage 1 conf vol	918					
vC2, stage 2 conf vol	771					
vCu, unblocked vol	1688	922			954	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	78	71			95	
cM capacity (veh/h)	295	322			713	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	156	944	37	692
Volume Left	64	0	37	0
Volume Right	92	73	0	0
cSH	311	1700	713	1700
Volume to Capacity	0.50	0.56	0.05	0.41
Queue Length 95th (m)	20.2	0.0	1.2	0.0
Control Delay (s)	27.7	0.0	10.3	0.0
Lane LOS	D		B	
Approach Delay (s)	27.7	0.0	0.5	
Approach LOS	D			

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	71	18	27	779	645	49
Future Volume (Veh/h)	71	18	27	779	645	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	91	23	30	866	701	53
Pedestrians	5			5	5	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1664	738	759			
vC1, stage 1 conf vol	732					
vC2, stage 2 conf vol	931					
vCu, unblocked vol	1664	738	759			
tC, single (s)	6.6	6.2	4.1			
tC, 2 stage (s)	5.6					
tF (s)	3.7	3.3	2.2			
p0 queue free %	67	94	96			
cM capacity (veh/h)	272	414	848			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	114	30	866	754
Volume Left	91	30	0	0
Volume Right	23	0	0	53
cSH	293	848	1700	1700
Volume to Capacity	0.39	0.04	0.51	0.44
Queue Length 95th (m)	13.5	0.8	0.0	0.0
Control Delay (s)	24.9	9.4	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	24.9	0.3		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	81	35	16	66	13	38	511	8	19	453	55
Future Volume (vph)	67	81	35	16	66	13	38	511	8	19	453	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.98	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1829	1554		1822		1786	1878		1786	1848	
Flt Permitted		0.83	1.00		0.92		0.39	1.00		0.40	1.00	
Satd. Flow (perm)		1562	1554		1686		733	1878		751	1848	
Peak-hour factor, PHF	0.88	0.88	0.88	0.80	0.80	0.80	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	76	92	40	20	82	16	41	555	9	22	515	62
RTOR Reduction (vph)	0	0	33	0	8	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	168	7	0	111	0	41	563	0	22	573	0
Confl. Peds. (#/hr)	10		5	5		10	5		5	5		5
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		12.8	12.8		12.8		45.1	45.1		45.1	45.1	
Effective Green, g (s)		12.8	12.8		12.8		45.1	45.1		45.1	45.1	
Actuated g/C Ratio		0.18	0.18		0.18		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		286	284		308		472	1211		484	1192	
v/s Ratio Prot								0.30			c0.31	
v/s Ratio Perm		c0.11	0.00		0.07		0.06			0.03		
v/c Ratio		0.59	0.03		0.36		0.09	0.47		0.05	0.48	
Uniform Delay, d1		26.1	23.4		25.0		4.7	6.3		4.5	6.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.1	0.0		0.7		0.4	1.3		0.2	1.4	
Delay (s)		29.2	23.5		25.7		5.0	7.6		4.7	7.8	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		28.1			25.7			7.4			7.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	193	100	89	239	160	77	410	61	139	437	85
Future Volume (vph)	99	193	100	89	239	160	77	410	61	139	437	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.98			0.98			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.95			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		3332			3296			3470			3439	
Flt Permitted		0.57			0.71			0.71			0.68	
Satd. Flow (perm)		1921			2372			2468			2363	
Peak-hour factor, PHF	0.82	0.82	0.82	0.68	0.68	0.68	0.90	0.90	0.90	0.76	0.76	0.76
Adj. Flow (vph)	121	235	122	131	351	235	86	456	68	183	575	112
RTOR Reduction (vph)	0	40	0	0	71	0	0	9	0	0	13	0
Lane Group Flow (vph)	0	438	0	0	646	0	0	601	0	0	857	0
Confl. Peds. (#/hr)	50		60	60		50	60		50	50		60
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		26.1			26.1			46.1			46.1	
Effective Green, g (s)		26.1			26.1			46.1			46.1	
Actuated g/C Ratio		0.31			0.31			0.55			0.55	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		595			735			1351			1293	
v/s Ratio Prot												
v/s Ratio Perm		0.23			c0.27			0.24			c0.36	
v/c Ratio		0.74			0.88			0.45			0.66	
Uniform Delay, d1		26.0			27.6			11.4			13.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.7			11.6			1.1			1.3	
Delay (s)		30.7			39.1			12.5			14.8	
Level of Service		C			D			B			B	
Approach Delay (s)		30.7			39.1			12.5			14.8	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	84.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	125.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	20	786	26	15	648
Future Volume (Veh/h)	34	20	786	26	15	648
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)	37	22	854	28	16	704
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1604	868			882	
vC1, stage 1 conf vol	868					
vC2, stage 2 conf vol	736					
vCu, unblocked vol	1604	868			882	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	94			98	
cM capacity (veh/h)	320	352			767	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	59	882	16	704
Volume Left	37	0	16	0
Volume Right	22	28	0	0
cSH	331	1700	767	1700
Volume to Capacity	0.18	0.52	0.02	0.41
Queue Length 95th (m)	4.9	0.0	0.5	0.0
Control Delay (s)	18.2	0.0	9.8	0.0
Lane LOS	C		A	
Approach Delay (s)	18.2	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	15	11	205	115	9
Future Volume (Veh/h)	12	15	11	205	115	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	16	12	223	125	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	377	130	135			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	377	130	135			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	619	920	1449			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	29	235	135
Volume Left	13	12	0
Volume Right	16	0	10
cSH	755	1449	1700
Volume to Capacity	0.04	0.01	0.08
Queue Length 95th (m)	0.9	0.2	0.0
Control Delay (s)	10.0	0.5	0.0
Lane LOS	A	A	
Approach Delay (s)	10.0	0.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix H –
OTM Signal Justification Sheets

Justification No. 7 - Total (2032) Traffic

Peter St N / North St

Justification	Description		Compliance			Signal Warrant	Underground Provisions Warrant
			Sectional		Entire %		
		Rest. Flow	Numerical	%			
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches (average hour)	720	290	40%	34%	NO	NO
	B. Vehicle volume, along minor streets (average hour)	170	133	78%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	720	125	17%	14%	NO	NO
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	75	87	117%		NO	YES

Justification No. 7 - Total (2032) Traffic

West Street N / Borland Street

Justification	Description		Compliance			Signal Warrant	Underground Provisions Warrant
			Sectional		Entire %		
		Rest. Flow	Numerical	%			
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches (average hour)	720	768	107%	22%	NO	YES
	B. Vehicle volume, along minor streets (average hour)	170	45	26%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	720	712	99%	29%	NO	NO
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	75	26	35%		NO	NO

Justification No. 7 - Total (2032) Traffic

West Street N / North Street E

Justification	Description		Compliance			Signal Warrant	Underground Provisions Warrant
			Sectional		Entire %		
		Rest. Flow	Numerical	%			
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches (average hour)	720	795	110%	20%	NO	YES
	B. Vehicle volume, along minor streets (average hour)	255	63	25%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	720	708	98%	38%	NO	NO
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	75	34	45%		NO	NO

Justification No. 7 - Total (2032) Traffic

West Street N / North Street W

Justification	Description		Compliance			Signal Warrant	Underground Provisions Warrant
			Sectional		Entire %		
		Rest. Flow	Numerical	%			
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches (average hour)	720	771	107%	14%	NO	YES
	B. Vehicle volume, along minor streets (average hour)	255	42	16%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	720	704	98%	38%	NO	NO
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	75	34	45%		NO	NO

Appendix I –
Proxy Parking Data

Simcoe County Housing Corporation

Affordable Housing Parking Ratio Summary
as of September 16/20

Building	No. Units	Residential Parking Spaces	Current Cars	Actual Cars/unit
[redacted], Bradford	25	27	13	0.52
[redacted], Barrie	107	86	47	0.44
[redacted], Collingwood	147	132	75	0.51
[redacted], Wasaga Beach	99	95	55	0.56
[redacted] Victoria Harbour	41	67	18	0.44