March 9, 2020

Mr. Aaron Gold
Vice President, Operation

King & Brookeast Inc.
10 Wanless Avenue, Suite 201
Toronto, ON M4N 1V6

Re: Proposed Commercial Development
428-432 King Street East, Town of Cobourg
Transportation Study

CGE Transportation Consulting is pleased to submit this Transportation Study for the proposed commercial development located at the north-east corner of the King Street East and Brook Road North intersection, in the Town of Cobourg.

Based on a comprehensive review, the proposed parking supply is adequate to support the expected parking demand generated by the development proposal.

In addition, the study concludes that the incremental site traffic generated by the proposed development can be accommodated by the existing transportation network, no roadway improvements are required. The proposed site access can adequately support the forecasted traffic operations.

Should you have any questions regarding this study, please do not hesitate to contact the undersigned.

Yours truly,

CGE TRANSPORTATION CONSULTING

Casey Ge, P.Eng.
President

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1.0 INTRODUCTION

CGE Transportation Consulting was retained by King & Brookeast Inc. to prepare a Transportation Study for a proposed commercial development located in the north-east quadrant of the King Street East and Brook Road North intersection, in the Town of Cobourg.

Existing Site Descriptions:

The site is bounded by low density residential to the north and east, King Street East to the south and Brook Road North to the west. It is currently vacant.

The location of the proposed development is illustrated in Figure 1.

Development Proposal Descriptions:

Based on the current version of the proposed site plan and information provided by the Owner, the development proposal consists of 2 phases with 4 buildings and the total floor area is 1,238.94 m² (13,335.54 ft²).

Details are summarized in Table 1.

Table 1 Site Development Summary

Phase	Parcel	Building	Land Use	Floor Area
1	A	4	Gas Station with Convenience Store	185.85 m² (2,000.00 ft²)
	B	1	Tim Horton's with Drive Through Window	254.14 m² (2,735.54 ft²)
2	B	2	General Retail	464.51 m² (5,000.00 ft²)
	B	3	Restaurant with Drive-Through Window	334.44 m² (3,600.00 ft²)
Site Total				1,238.94 m² (13,335.54 ft²)

Note: Proposed Gas Station with 8 fuel pumps as shown on the site plan.

Vehicular access to the site will be accommodated by 2 full-movement driveways (1 via Brook Road North and 1 via King Street East). A total of 81 surface parking spaces will be provided.

The proposed draft plan is provided in Figure 2.

Scope of Work:

The study area consists of the following key intersections:

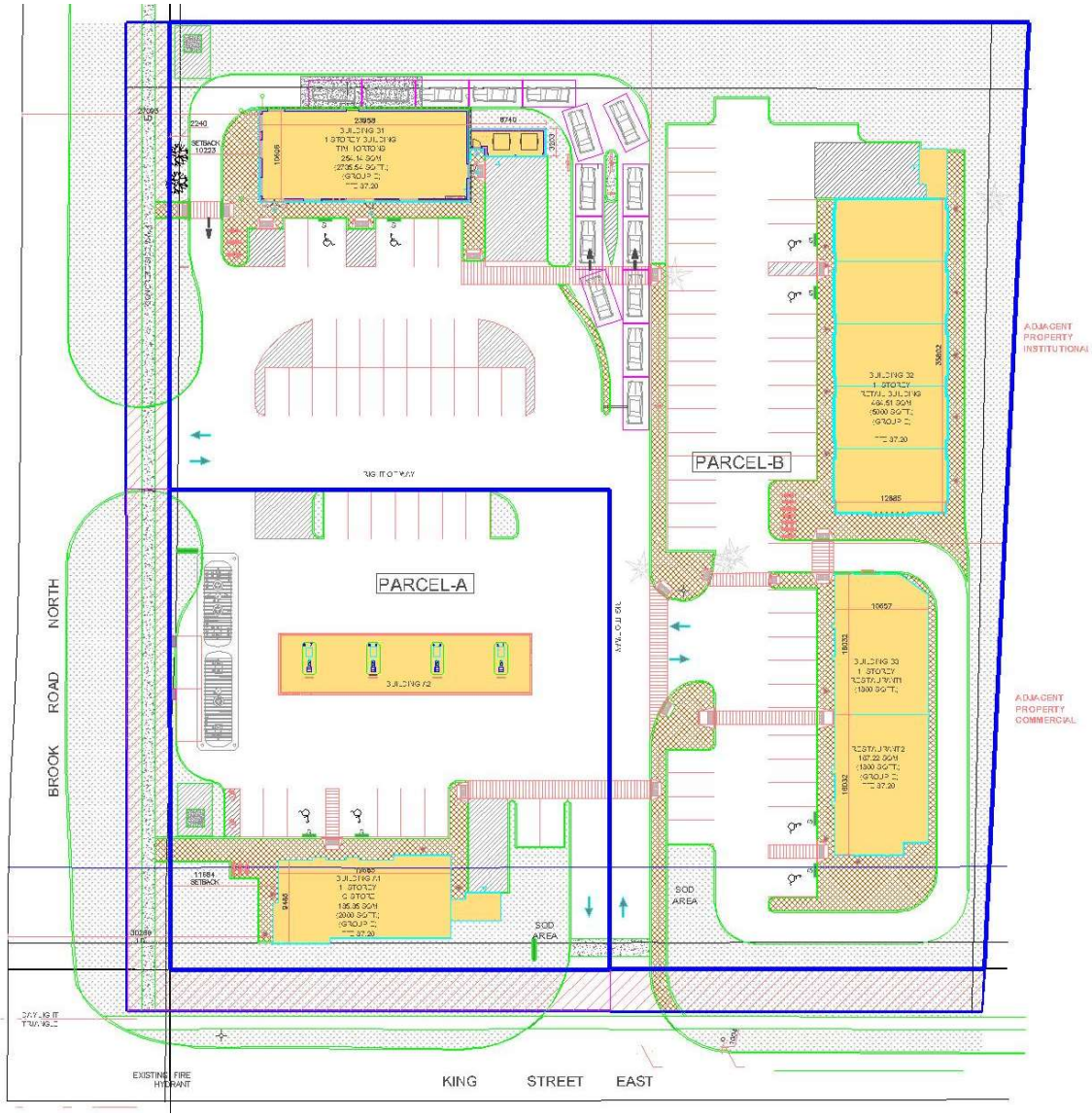
- King Street East and Brook Road North
- Brook Road North and Proposed Site Driveway (North)
- King Street East and Proposed Site Driveway (East)

Estimation of site generated trip will utilize the *Trip Generation Manual, 10th Edition*, published by the Institute of Transportation Engineer (ITE). The analysis is developed for the weekday morning, weekday afternoon and Saturday peak hours.

Figure 1 Site Location

Source: Google Maps

Figure 2 Proposed Site Plan



2.0 EXISTING AREA

2.1 Existing Road Network

The existing road network, lane configuration and existing traffic control for the study area are shown in Figure 3. The details are described below:

- **King Street East:** is an east-west arterial road under the jurisdictional control of Town of Cobourg. It has 2 general purpose lanes and it maintains a posted speed limit of 50 km/h in the vicinity of the subject site. Sidewalks are provided on both sides of the road and dedicated bicycle lanes are provided on both sides of the road.
- **Brook Road North:** is a north-south arterial road under the jurisdictional control of Town of Cobourg. It has 2 general purpose lanes and it maintains a posted speed limit of 50 km/h in the vicinity of the subject site. Sidewalk is provided on the east side of the road and dedicated bicycle lanes are provided on both sides of the road.

2.2 Existing Transit Services

The subject site is currently served by the following bus route operated by Cobourg Transit. It provides existing and future residents access and connections to both local and regional public transit system:

- **Route 1** – operates between the area of Northumberland Mall and Downtown Lucas Point area, generally in an east-west direction. This route operations everyday. The weekday hours are between 6:15 AM and 7:45 PM, Saturday hours are between 8:15 AM and 6:45 PM and Sunday hours are between 8:45 AM and 3:45 PM.

Existing transit facilities are illustrated in Figure 4.

Figure 3 Existing Road Network

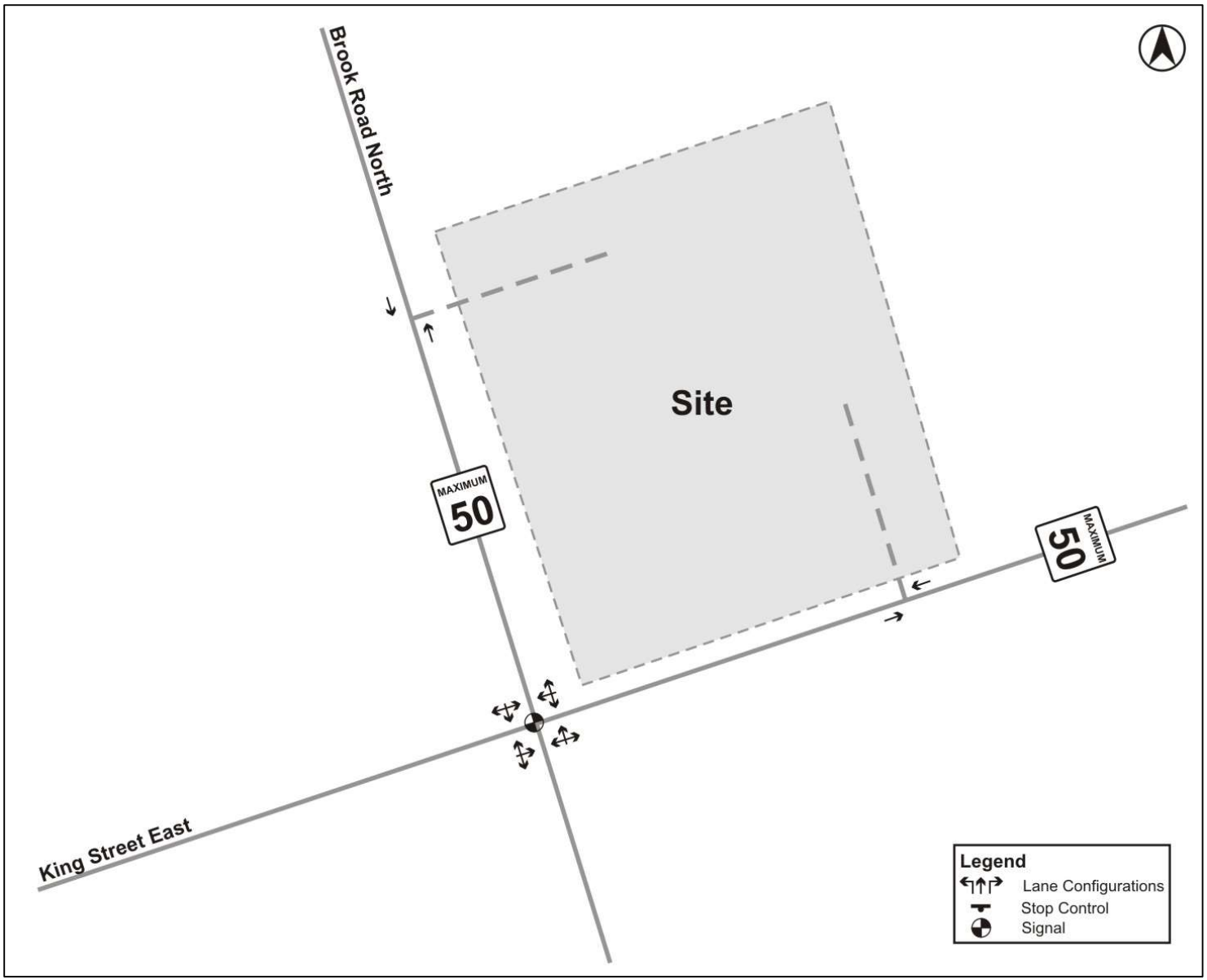


Figure 4 Existing Transit Facilities

Source: Cobourg Geomatics, 2018

3.0 SITE PLAN REVIEW

3.1 Loading

Truck maneuvering diagram was prepared using the AutoTURN software and it is enclosed in Appendix A.

3.2 Vehicular Parking

3.2.1 Zoning By-law Reviews

In according to the Town of Cobourg Zoning By-law No. 85-2003 (revised on March 8, 2004), the vehicle parking requirements for the proposed development are provided in Table 2.

Table 2 Vehicle Parking Requirements (Zoning By-law No. 85-2003)

Land Use		Floor Area	Parking	
Site Plan	Zoning By-law No. 85-2003		Rates	Spaces
Gas Station with Convenience Store	Vehicle Fuelling Station	8 pumps	2 spaces per pump	2 spaces
	Retail Commercial Use	185.85 m²	1 space for every 18 m² of GFA	10 spaces
Tim Horton's with Drive Through Window	Eating Establishments	254.14 m²	1 space for every 9 m² of GFA	28 spaces
General Retail	Retail Commercial Use	464.51 m²	1 space for every 18 m² of GFA	26 spaces
Restaurant with Drive-Through Window	Eating Establishments	334.44 m²	1 space for every 9 m² of GFA	37 spaces
Site Total				117 spaces

The proposed commercial development will require 117 parking spaces under the Town's Zoning By-law parking requirements.

3.2.2 Draft Zoning By-law 2013 Reviews

In recognition of recent shift in non-auto modes of travelling, the Town has completed a study dated May 2013 to review the existing Zoning By-law requirements and provide recommendations to update the existing parking standards. The study and the associated recommendations are yet to be adopted by Town's Council however it provides an indication on the direction the Town intended to achieve.

In addition, as per Section 5.4.1 a 10% reduction is permitted if there are more than one land uses. Details are provided in Table 3.

Table 3 Vehicle Parking Requirements (Draft Zoning By-law 2013)

Land Use		Floor Area	Parking	
Site Plan	Draft Zoning By-law 2013		Rates	Spaces
Gas Station with Convenience Store	Convenience Retail Store	185.85 m²	1 space for every 20 m² of GFA	9 spaces
Tim Horton's with Drive Through Window	Restaurants	254.14 m²	1 space for every 9 m² of GFA	28 spaces
General Retail	Retail Store	464.51 m²	1 space for every 20 m² of GFA	23 spaces
Restaurant with Drive-Through Window	Restaurants	334.44 m²	1 space for every 9 m² of GFA	37 spaces
Site Total				97 spaces
10% Reduction				-10 spaces
Site Total (after 10% reduction)				87 spaces

The proposed commercial development will require 87 parking spaces under the Town's Draft Zoning By-law 2013 parking requirements.

4.0 TRAFFIC VOLUMES

4.1 Existing Traffic Volumes

Baseline traffic volumes at the study intersection were collected by Accu-Traffic Inc. on Thursday September 12, 2019 during the weekday AM (7:00 to 9:00) and PM (4:00 to 6:00) peak periods.

In addition, we have contacted the Town for a copy of the official signal timing plan and cycle lengths for the signalized intersection of King Street East and Brook Road North. However, we have not received the information when the analysis contained herein were completed. Therefore, for the purpose of this study the signal timings were optimized under all analysis scenarios.

The assumed baseline traffic volumes are illustrated in Figure 5 and a copy of the data is provided in Appendix B.

4.2 Future Background Traffic Volumes

4.2.1 Background Developments

We have contacted the Town and it is our understanding there are no background developments within the proximity of the subject site.

4.2.2 Analysis Horizon Year

Based on discussion with Owner, a 5-year planning horizon (2024) was selected which represents the full build-out of the proposed commercial development.

4.2.3 Corridor Growth

We have contacted the Town and County for historical traffic data. However, the requested information was unavailable. Therefore, a general growth rate of 2% compounded annually was selected and applied all movements.

Future background traffic volumes are illustrated in Figure 6.

Figure 5 Existing Traffic Volumes

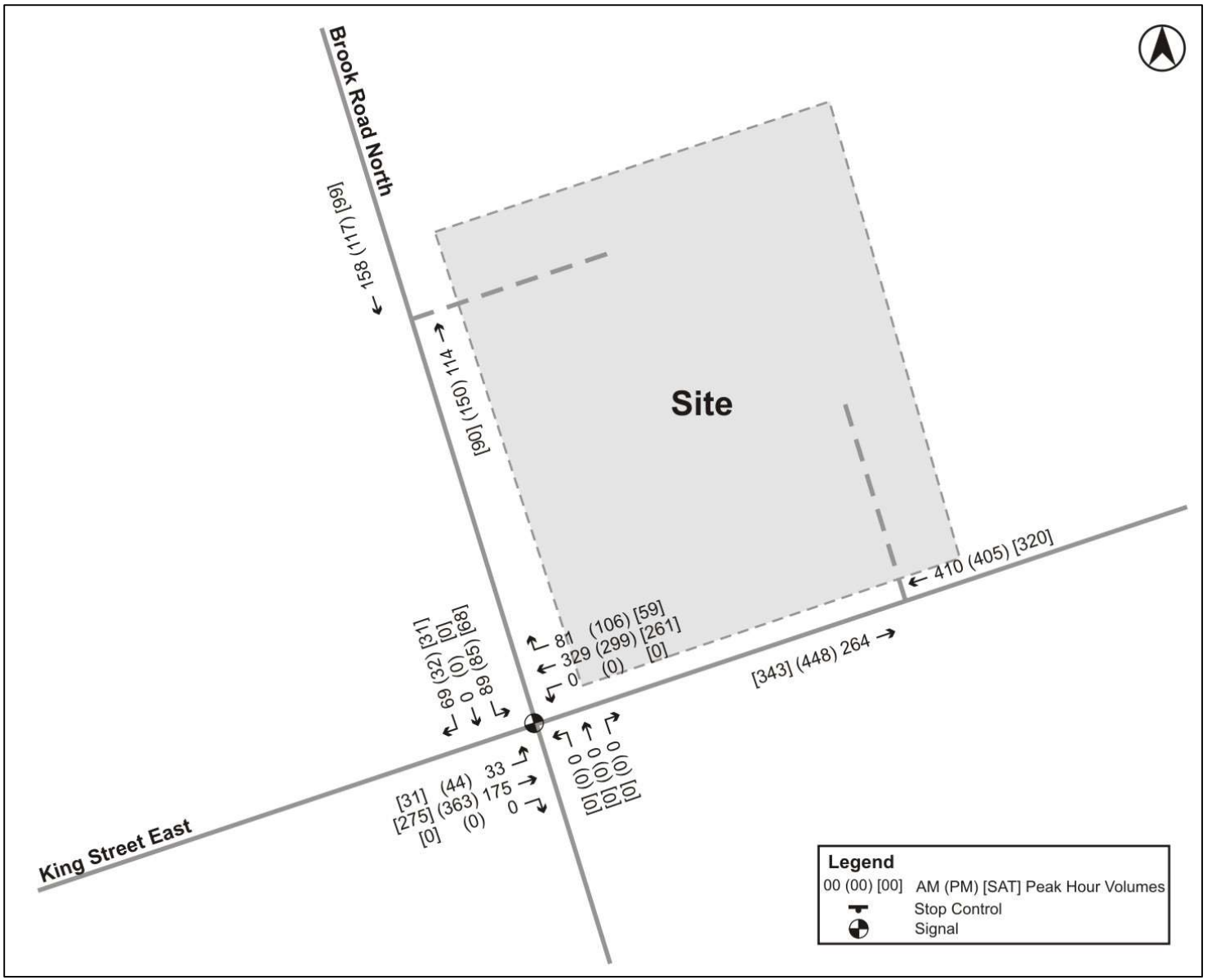
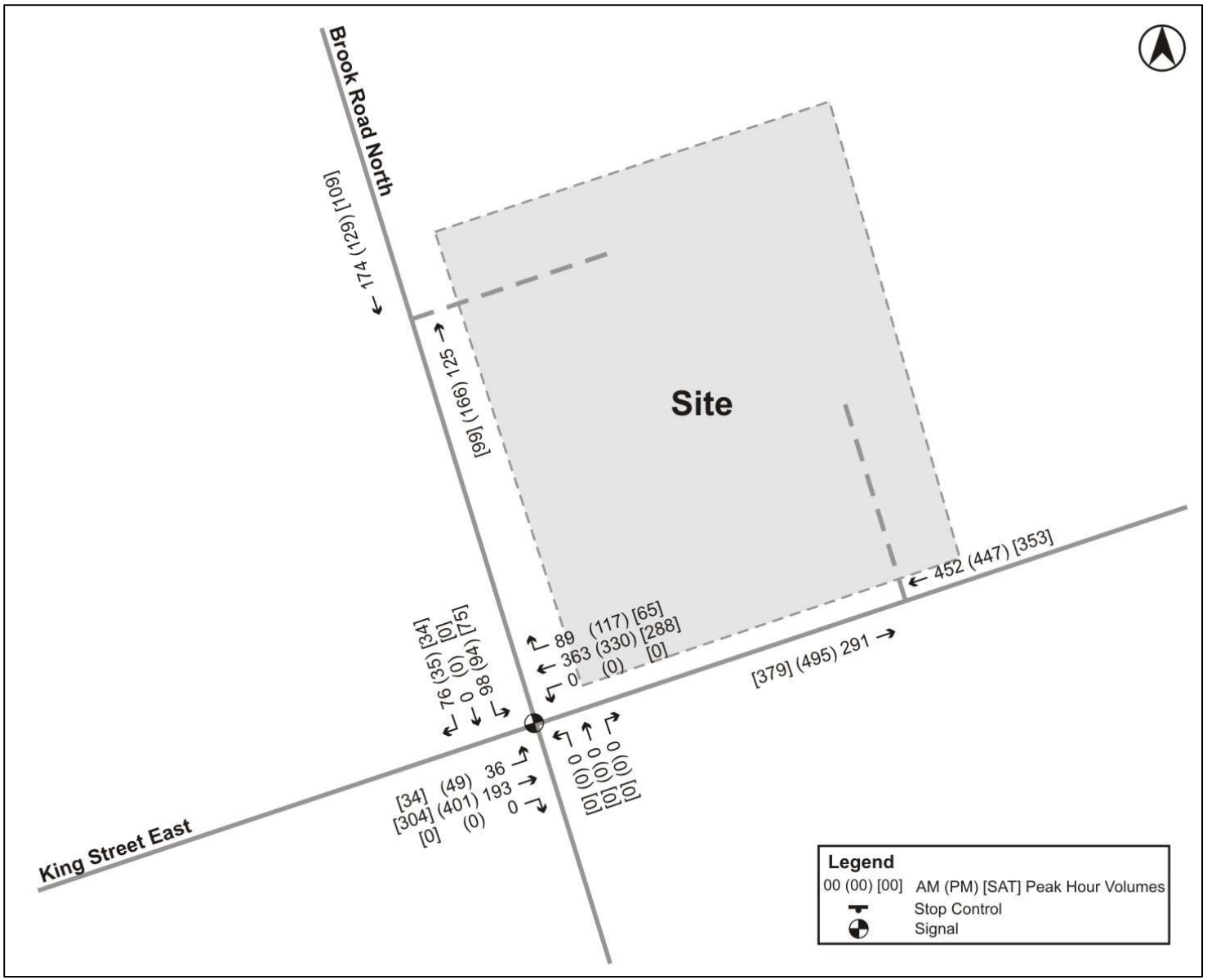


Figure 6 Future Background Traffic Volumes



4.3 Site Traffic Projection

4.3.1 Trip Generation

The projection of new additional traffic volumes generated by the development proposal is estimated based on the *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers (ITE). The following land use codes (LUC) were selected:

- Building 1: LUC 937 “Coffee/Donut Shop with Drive-Through Window”
- Building 2: LUC 820 “Shopping Centre”
- Building 3: LUC 934 “Fast-Food Restaurant with Drive-Through Window”
- Building 4: LUC 945 “Gasoline/Service Station with Convenience Market”

The following adjustments were considered to estimate the primary trips associated with the proposed commercial development:

- Pass-by rates: based on the information from the ITE Trip Generation Manual Appendix E – Database on Pass-By, Diverted, and Primary Trips.
- Internal capture rates: calculated using the “Internal Trip Capture Estimation Tool” from the National Cooperative Highway Research Program (NCHRP) Report No. 684.

Table 4 summarizes the total site trip generation for the proposed development.

Table 4 Site Trip Generation

Land Use		Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Building 1 "Tim Horton's"	New Trips	125	120	245	60	59	119	121	120	241
	Rates	45.45	43.64	89.09	21.82	21.45	43.27	44.00	43.64	87.64
	Internal Trips	5%			30%			30% [1]		
		6	6	12	18	18	36	36	36	72
	Pass-by	45%			50%			50% [1]		
		55	55	110	30	30	60	60	60	120
	Net Trips	64	59	123	12	11	23	25	24	49
Building 2 "Retail"	New Trips	3	2	5	9	10	19	12	11	23
	Rates	0.60	0.40	1.00	1.80	2.00	3.80	2.40	2.20	4.60
	Internal Trips	5%			30%			30%		
		0	0	0	3	3	6	4	3	7
	Pass-by	0%			30%			25%		
		0	0	0	5	5	10	5	5	10
	Net Trips	3	2	5	1	2	3	3	3	6
Building 3 "Restaurant"	New Trips	74	71	145	61	57	118	100	97	197
	Rates	20.56	19.72	40.28	16.94	15.84	32.78	27.78	26.94	54.72
	Internal Trips	5%			30%			30%		
		4	4	8	18	17	35	30	29	59
	Pass-by	45%			50%			50% [1]		
		35	35	70	30	30	60	50	50	100
	Net Trips	35	32	67	13	10	23	20	18	38
Building 4 "Gas Station"	New Trips	78	74	152	90	87	177	122	122	244
	Rates	39.00	37.00	76.00	45.00	43.50	88.50	61.00	61.00	122.00
	Internal Trips	5%			30%			30%		
		4	4	8	27	26	53	37	37	74
	Pass-by	60%			55%			55% [1]		
		45	45	90	50	50	100	65	65	130
	Net Trips	29	25	54	13	11	24	20	20	40
Site Total New Trips		**131**	**118**	**249**	**39**	**34**	**73**	**68**	**65**	**133**

Notes: 1) Saturday information unavailable and therefore assumed the same rate as Weekday PM period.

2) All rates were rounded down to the nearest 5%.

Based on the foregoing, the development proposal is anticipated to generate 249 two-way primary trips during the weekday morning peak hour, 73 two-way primary trips during the afternoon peak hour and 133 two-way primary trips during the Saturday peak hour.

4.3.2 Trip Distribution

The assumed trip distribution rates are based on the existing travel patterns and adjacent land uses.

Table 5 summaries the applied trip distribution pattern.

Table 5 Site Trip Distribution

Direction	Via	Weekday AM Peak Hour		Weekday PM Peak Hour		Saturday Peak Hour	
		In	Out	In	Out	In	Out
North	Brook Road North	20%	15%	15%	15%	15%	15%
East	King Street East	50%	35%	45%	50%	45%	50%
West	King Street East	30%	50%	40%	35%	40%	35%
Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

New site traffic volumes are illustrated in Figure 7 and pass-by trips are shown in Figure 8.

Figure 7 New Site Traffic Volumes

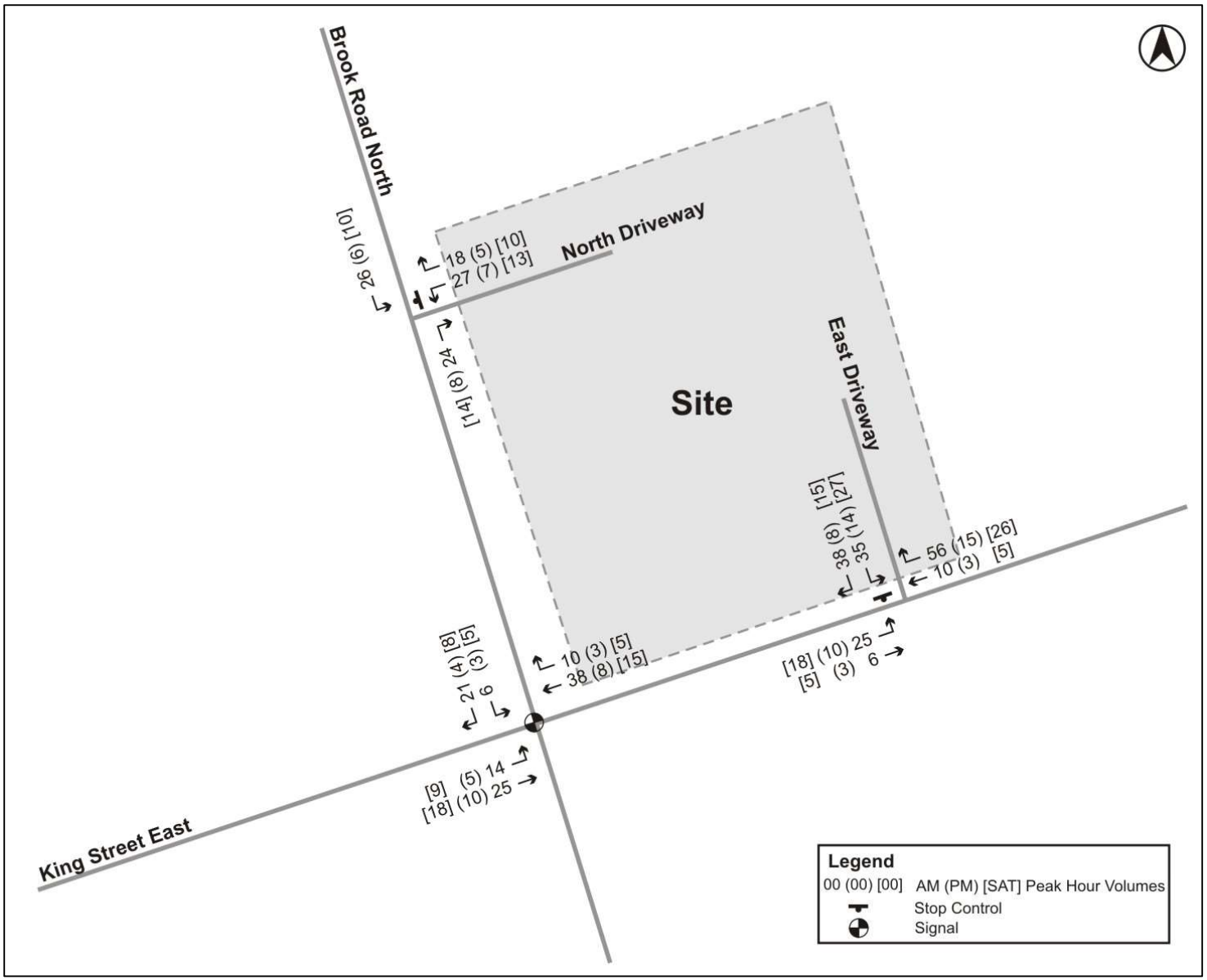
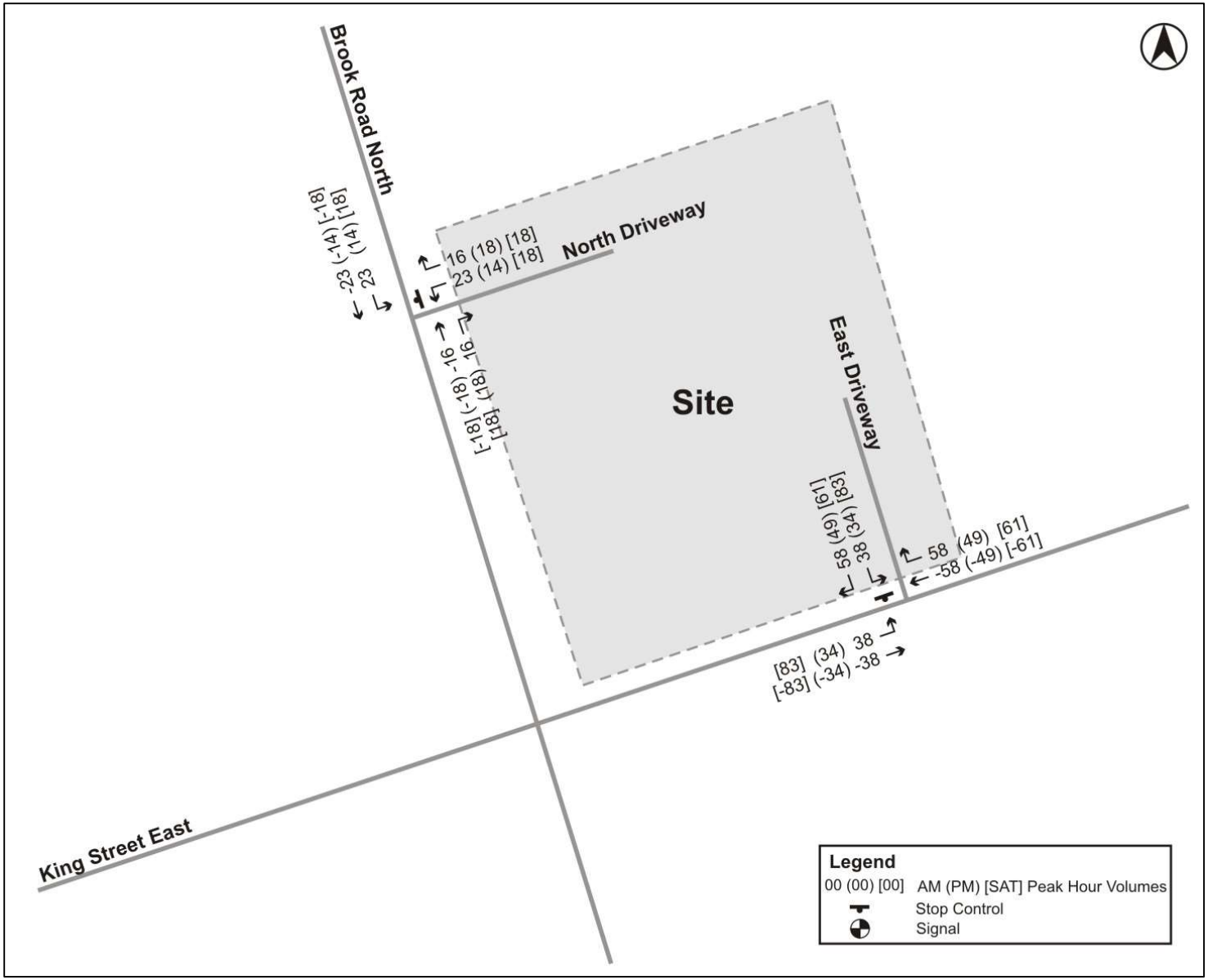


Figure 8 New Site Pass-by Trips



4.4 Future Road Network

It is our understanding that there are no roadway improvements approved or scheduled within the study area. The assumed future road network is illustrated in Figure 9.

4.5 Future Total Traffic Volumes

Future total traffic volumes were established by adding site generated traffic to the future background traffic, and they are illustrated in Figure 10.

5.0 Operation Analysis

Analysis Methodology:

Intersection capacity analyses contained in this study were undertaken using the Synchro software (Version 8), which is based on the methodologies and procedures outlined in the Highway Capacity Manual (HCM) 2000 published by the Transportation Research Board.

Analysis Summary:

The analysis results are summarized in the following tables:

- Table 6: Intersection Analysis Summary (Weekday AM Peak Hour)
- Table 7: Intersection Analysis Summary (Weekday PM Peak Hour)
- Table 8: Intersection Analysis Summary (Saturday Peak Hour)

Detailed Synchro calculations are provided in Appendix C.

Under all analysis scenarios, the study intersections are operating with acceptable delays (LOS ‘D’ or better) and sufficient capacity (below v/c ratio of 0.57 or better).

Figure 9 Future Road Network

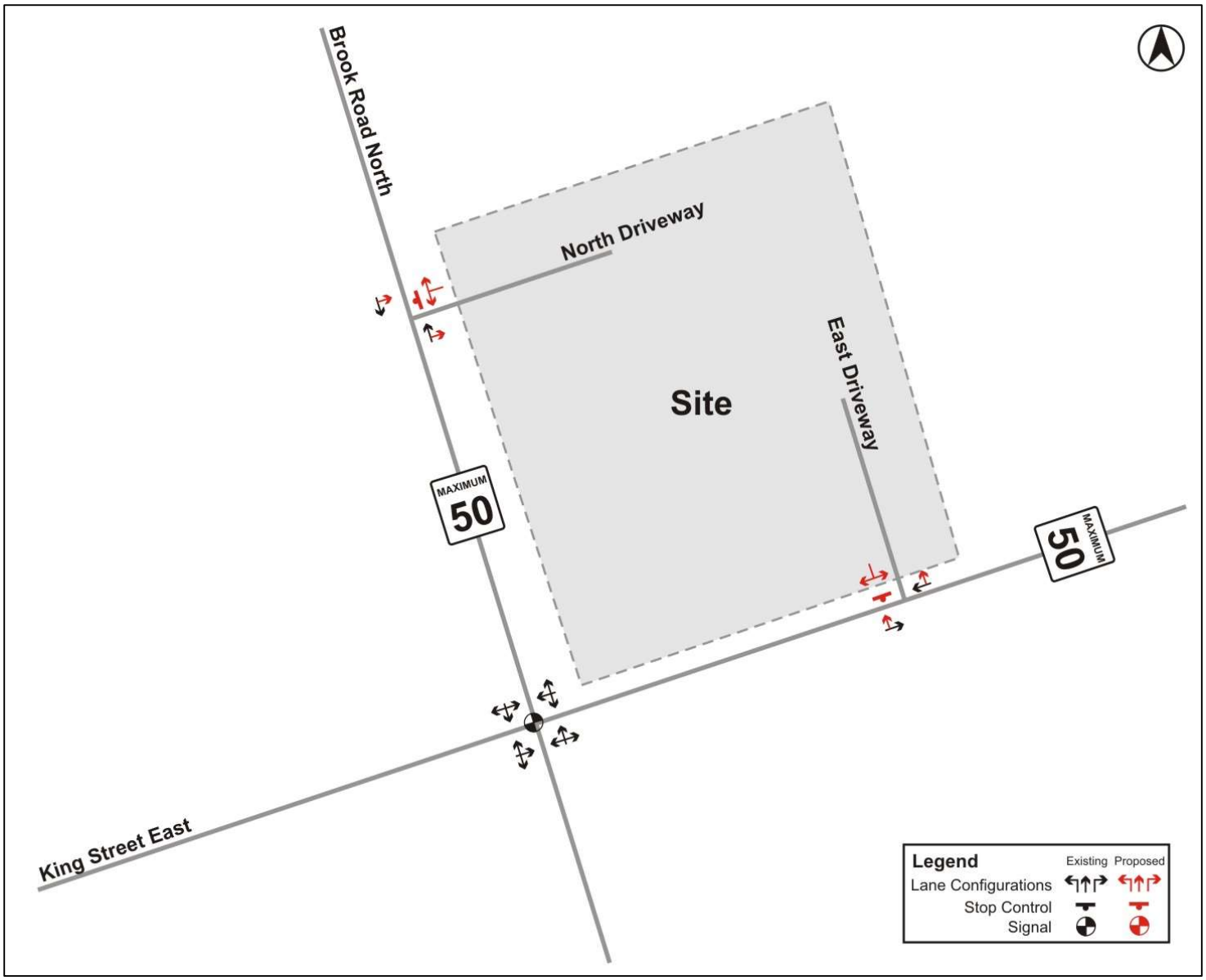


Figure 10 Future Total Traffic Volumes

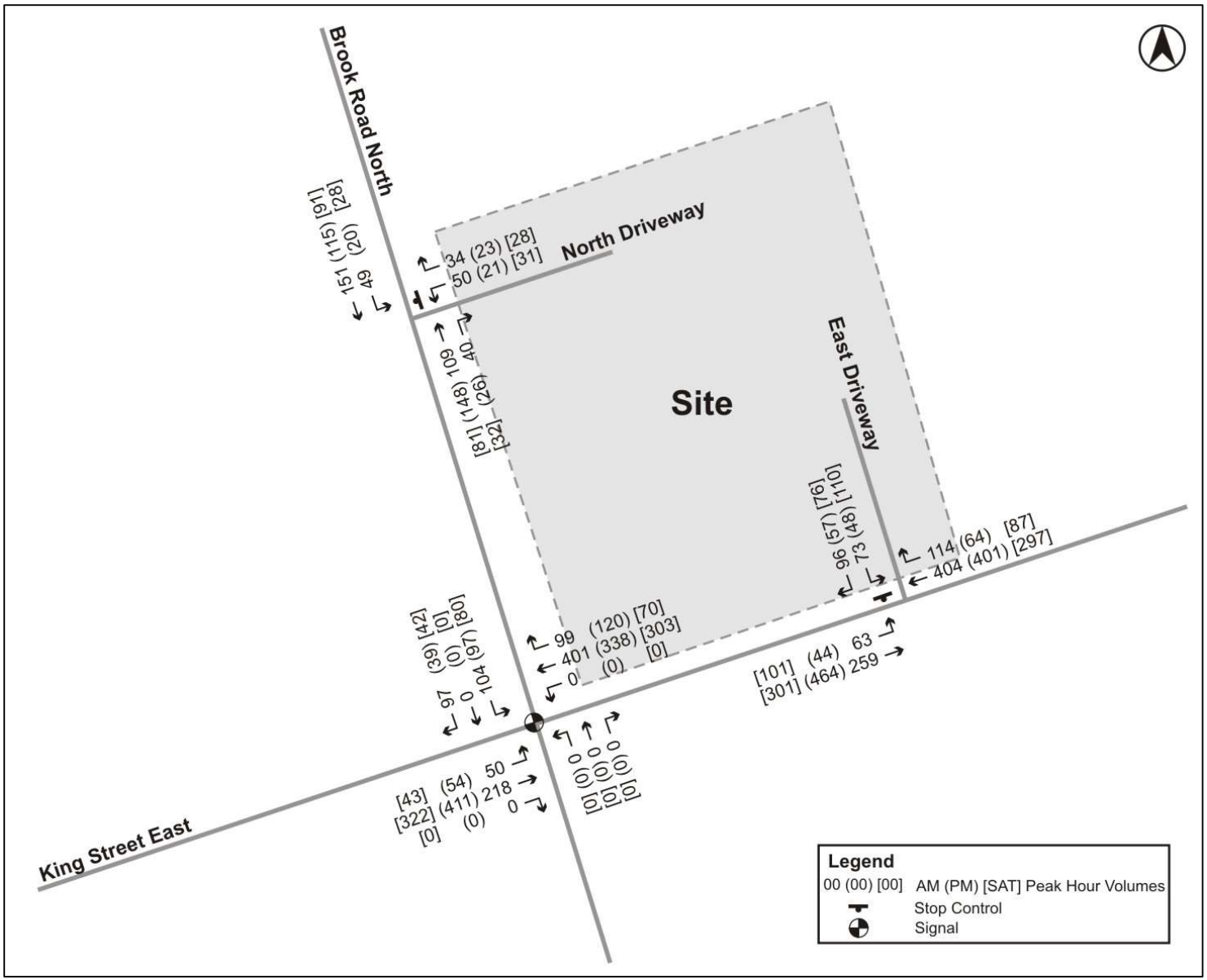


Table 6 Intersection Analysis Summary – Weekday AM Peak Hour

Intersection	Movement	Existing				Future Background				Future Total			
		LOS	v/c	Delays (s)	Queue (m)	LOS	v/c	Delays (s)	Queue (m)	LOS	v/c	Delays (s)	Queue (m)
King Street East and Brook Road North	EB LTR	B	0.30	13.6	38.1	B	0.34	14.0	42.4	B	0.48	16.7	54.9
	WB LTR	B	0.51	16.6	76.0	B	0.57	17.7	86.7	B	0.63	19.2	99.9
	NB LTR	A	0.00	0.0	0.0	A	0.00	0.0	0.0	A	0.00	0.0	0.0
	SB LTR	C	0.36	27.1	37.6	C	0.41	28.0	42.1	C	0.46	29.2	47.7
Brook Road North and North Driveway	WB LR	-								B	0.14	11.2	3.7
	NB TR									A	0.10	0.0	0.0
	SB LT									A	0.04	2.1	0.9
King Street East and East Driveway	EB LT	-								A	0.07	2.3	1.7
	WB TR									A	0.33	0.0	0.0
	SB LR									C	0.47	22.1	19.5

Note: signal timings were optimized at the King Street East and Brook Road North intersection.

Table 7 Intersection Analysis Summary – Weekday PM Peak Hour

Intersection	Movement	Existing				Future Background				Future Total			
		LOS	v/c	Delays (s)	Queue (m)	LOS	v/c	Delays (s)	Queue (m)	LOS	v/c	Delays (s)	Queue (m)
King Street East and Brook Road North	EB LTR	B	0.47	16.0	77.9	B	0.53	17.0	89.7	B	0.56	17.6	94.8
	WB LTR	B	0.44	15.3	71.7	B	0.48	16.1	81.5	B	0.50	16.3	84.2
	NB LTR	A	0.00	0.0	0.0	A	0.00	0.0	0.0	A	0.00	0.0	0.0
	SB LTR	C	0.21	24.5	27.6	C	0.24	24.9	30.9	C	0.26	25.2	32.5
Brook Road North and North Driveway	WB LR	-								B	0.06	10.2	1.6
	NB TR									A	0.11	0.0	0.0
	SB LT									A	0.02	1.2	0.4
King Street East and East Driveway	EB LT	-								A	0.05	1.2	1.1
	WB TR									A	0.30	0.0	0.0
	SB LR									C	0.34	21.3	11.9

Note: signal timings were optimized at the King Street East and Brook Road North intersection.

Table 8 Intersection Analysis Summary – Saturday Peak Hour

Intersection	Movement	Existing				Future Background				Future Total			
		LOS	v/c	Delays (s)	Queue (m)	LOS	v/c	Delays (s)	Queue (m)	LOS	v/c	Delays (s)	Queue (m)
King Street East and Brook Road North	EB LTR	B	0.33	13.8	52.3	B	0.37	14.3	58.5	B	0.40	14.8	64.2
	WB LTR	B	0.33	13.7	52.0	B	0.36	14.2	58.3	B	0.38	14.5	62.0
	NB LTR	A	0.00	0.0	0.0	A	0.00	0.0	0.0	A	0.00	0.0	0.0
	SB LTR	C	0.16	23.7	22.2	C	0.18	24.0	24.3	C	0.21	24.4	27.4
Brook Road North and North Driveway	WB LR	-								A	0.08	9.9	2.1
	NB TR									A	0.07	0.0	0.0
	SB LT									A	0.02	1.9	0.5
King Street East and East Driveway	EB LT	-								A	0.10	2.9	2.5
	WB TR									A	0.25	0.0	0.0
	SB LR									D	0.57	27.6	26.9

Note: signal timings were optimized at the King Street East and Brook Road North intersection.

6.0 AT-GRADE RAILWAY CROSSING ASSESSMENT

The existing at grade railway crossing located on Brook Road North (approximately 500 metres north of King Street East) is equipped with an automatic warning system and control gates.

The subject railway track is part of the network owned and operated by Canadian National Railway and the average daily volume is 44 trains including 24 freight trains and 20 VIA Rail trains.

The exposure index is calculated by multiplying the average annual daily traffic (AADT) by the average daily railway traffic, and has been commonly used by transportation agencies to assess safety and impacts to road users. Although there is no mandate, Transport Canada typically indicates that a grade separation should be considered when the exposure index for a grade crossing exceeds 200,000.

Table 9 provide the summary of the exposure index for the subject grade crossing.

Table 9 Grade Separation Railway Crossing Warrant Assessment

Location	AADT	Average Daily No. of Trains	Exposure Index		Grade Separation
			Subject Location	Minimum Threshold	
Brook Road North (Approx. 500 metres north of King Street East)	Approx. 3,000	44 Trains	132,000	200,000	No

Based on the results contained herein, the existing grade crossing on Brook Road North (approximately 500 meters north of King Street East) does not meet the minimum threshold and therefore grade separation is not required.

7.0 CONCLUSIONS

The site is bounded by low density residential to the north and east, King Street East to the south and Brook Road North to the west. It is currently vacant.

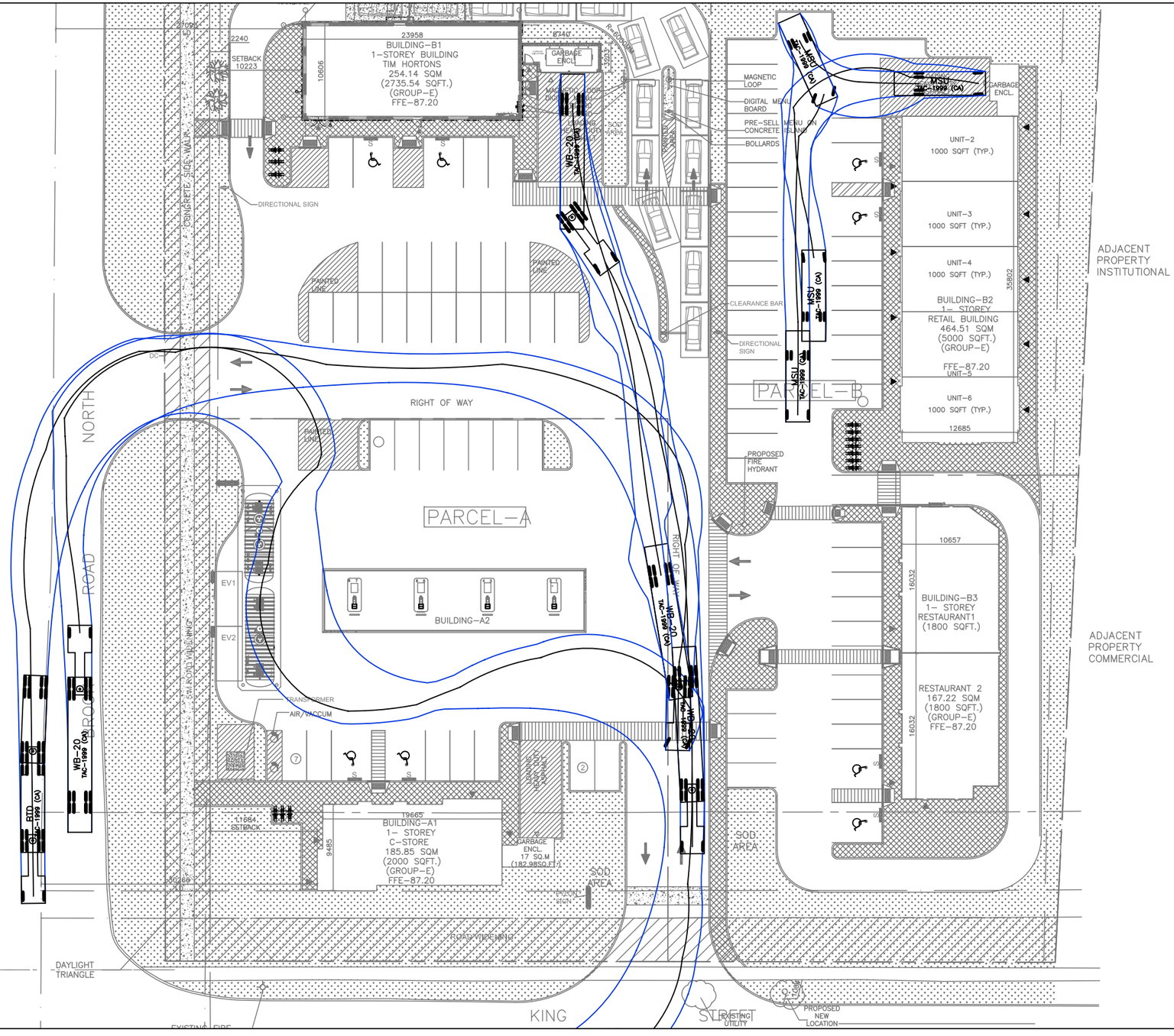
Based on the current version of the proposed site plan and information provided by the Owner, the development proposal consists of 2 phases with 4 buildings and the total floor area is 1,238.94 m² (13,335.54 ft²). Details are provided in Table 1. Vehicular access to the site will be accommodated by 2 full-movement driveways (1 via Brook Road North and 1 via King Street East). A total of 81 surface parking spaces will be provided.

The key findings are summarized below:

- Parking supply is adequate to support the expected parking demand generated by the development proposal.
- Based on the results contained herein, the existing grade crossing on Brook Road North (approximately 500 metres north of King Street East) does not meet the minimum threshold and therefore grade separation is not required.
- Under all analysis scenarios, the study intersections are operating with acceptable delays and sufficient capacity.
- New traffic generated by the development proposal can be accommodated at the study intersections. There are no mitigation measures required.
- The proposed site driveways are expected to operate with acceptable delays and sufficient capacity.

Appendix A:

AutoTURN Manoeuvring Diagram



428-432 King Street East, Town of Cobourg

AutoTURN - Manoeuvring Diagram

TRANSPORTATION CONSULTING

Date: March 2020

Revised: -

Drawing No.: A1

Scale 1:500

0 500 1000

Project North

Appendix B:

Traffic Data

Accu-Traffic Inc.

Morning Peak Diagram

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

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

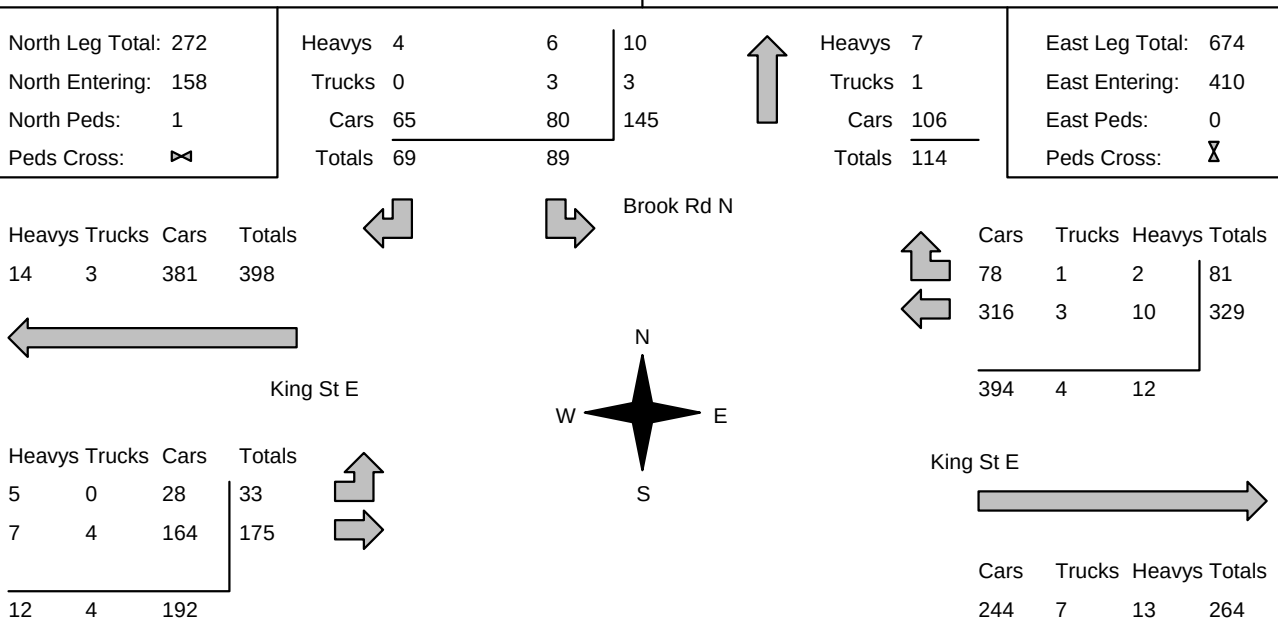
Municipality: Cobourg
Site #: 1914700001
Intersection: King St E & Brook Rd N
TFR File #: 1
Count date: 12-Sep-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: King St E runs W/E



Peds Cross:
West Peds: 7
West Entering: 208
West Leg Total: 606

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

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

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

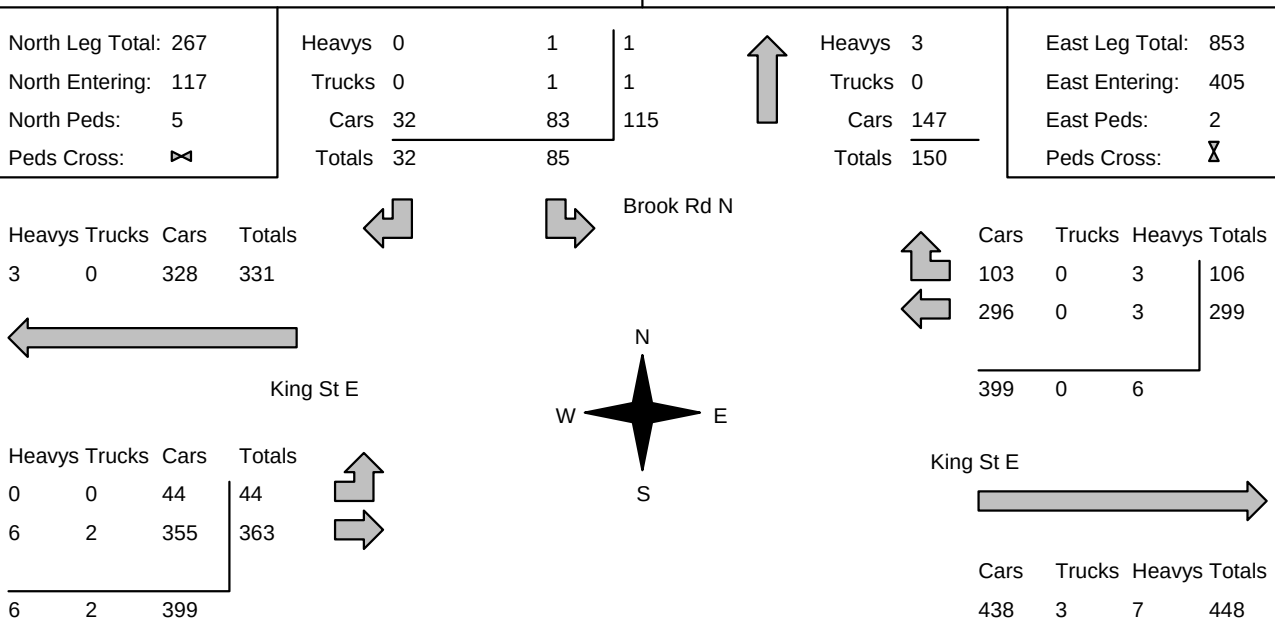
Municipality: Cobourg
Site #: 1914700001
Intersection: King St E & Brook Rd N
TFR File #: 1
Count date: 12-Sep-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: King St E runs W/E



Peds Cross:
West Peds: 0
West Entering: 407
West Leg Total: 738

Comments

Accu-Traffic Inc.

Total Count Diagram

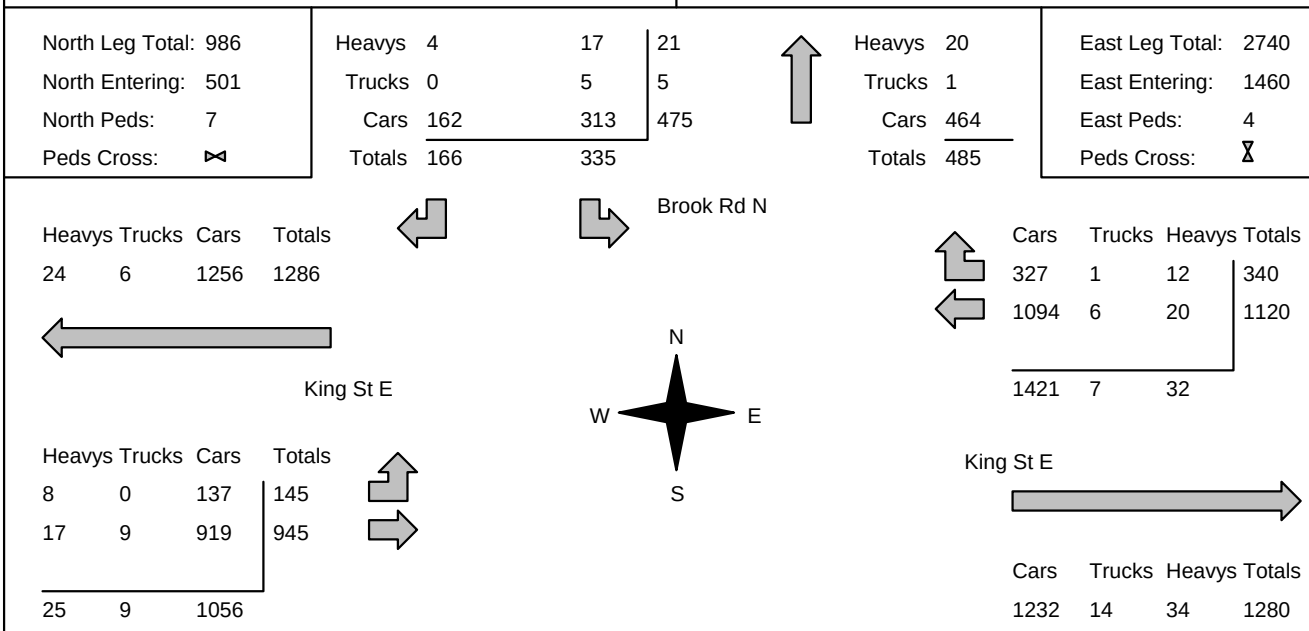
Municipality: Cobourg
Site #: 1914700001
Intersection: King St E & Brook Rd N
TFR File #: 1
Count date: 12-Sep-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: King St E runs W/E



Peds Cross:
West Peds: 7
West Entering: 1090
West Leg Total: 2376

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: King St E & Brook Rd N | **Count Date:** 12-Sep-19 | **Municipality:** Cobourg

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*72*	*0*	*39*	*111*	*0*
9:00:00	*89*	*0*	*69*	*158*	*1*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*87*	*0*	*36*	*123*	*2*
18:00:00	*87*	*0*	*22*	*109*	*4*
Totals:	335	0	166	501	7

North/South Total Approaches: 501

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*0*	*0*	*0*	*0*
9:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*0*	*0*	*0*	*0*	*0*
18:00:00	*0*	*0*	*0*	*0*	*0*
S Totals:	0	0	0	0	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*249*	*86*	*335*	*0*
9:00:00	*0*	*308*	*79*	*387*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*0*	*297*	*104*	*401*	*0*
18:00:00	*0*	*266*	*71*	*337*	*4*
Totals:	0	1120	340	1460	4

East/West Total Approaches: 2550

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*18*	*133*	*0*	*151*	*0*
9:00:00	*40*	*175*	*0*	*215*	*7*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*52*	*350*	*0*	*402*	*0*
18:00:00	*35*	*287*	*0*	*322*	*0*
W Totals:	145	945	0	1090	7

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*16:00*	*17:00*	*18:00*	*0:00*	*0:00*
Crossing Values:	*0*	*72*	*96*	*0*	*87*	*91*	*0*	*0*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 12-Sep-19 Site #: 1914700001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	13	13	0	0	15	15	0	0	0	0	0	0	3	3	0	0	0	0	0	0
7:30:00	28	15	0	0	20	5	0	0	0	0	0	0	3	0	0	0	0	0	0	0
7:45:00	42	14	0	0	28	8	0	0	0	0	0	0	4	1	0	0	0	0	0	0
8:00:00	65	23	0	0	38	10	1	1	0	0	0	0	6	2	0	0	1	1	0	0
8:15:00	88	23	0	0	67	29	2	1	0	0	0	0	8	2	0	0	3	2	0	0
8:30:00	108	20	0	0	78	11	2	0	0	0	0	0	9	1	0	0	4	1	1	1
8:45:00	122	14	0	0	93	15	3	1	0	0	0	0	10	1	0	0	4	0	1	0
9:00:00	145	23	0	0	104	11	3	0	0	0	0	0	13	3	0	0	4	0	1	0
9:15:00	145	0	0	0	104	0	3	0	0	0	0	0	13	0	0	0	4	0	1	0
16:00:00	145	0	0	0	104	0	3	0	0	0	0	0	13	0	0	0	4	0	1	0
16:15:00	163	18	0	0	117	13	3	0	0	0	0	0	14	1	0	0	4	0	1	0
16:30:00	183	20	0	0	128	11	3	0	0	0	0	0	15	1	0	0	4	0	1	0
16:45:00	210	27	0	0	135	7	3	0	0	0	0	0	15	0	0	0	4	0	1	0
17:00:00	229	19	0	0	140	5	4	1	0	0	0	0	15	0	0	0	4	0	3	2
17:15:00	246	17	0	0	149	9	4	0	0	0	0	0	15	0	0	0	4	0	6	3
17:30:00	270	24	0	0	151	2	4	0	0	0	0	0	16	1	0	0	4	0	7	1
17:45:00	290	20	0	0	158	7	5	1	0	0	0	0	16	0	0	0	4	0	7	0
18:00:00	313	23	0	0	162	4	5	0	0	0	0	0	17	1	0	0	4	0	7	0
18:15:00	313	0	0	0	162	0	5	0	0	0	0	0	17	0	0	0	4	0	7	0
18:15:15	313	0	0	0	162	0	5	0	0	0	0	0	17	0	0	0	4	0	7	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 12-Sep-19 Site #: 1914700001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	61	61	29	29	0	0	0	0	0	0	0	0	2	2	0	0	0	0
7:30:00	0	0	119	58	39	10	0	0	2	2	0	0	0	0	2	0	2	2	0	0
7:45:00	0	0	166	47	59	20	0	0	2	0	0	0	0	0	2	0	5	3	0	0
8:00:00	0	0	241	75	80	21	0	0	3	1	0	0	0	0	5	3	6	1	0	0
8:15:00	0	0	344	103	100	20	0	0	4	1	1	1	0	0	11	6	6	0	0	0
8:30:00	0	0	411	67	120	20	0	0	5	1	1	0	0	0	12	1	7	1	0	0
8:45:00	0	0	482	71	137	17	0	0	5	0	1	0	0	0	12	0	7	0	0	0
9:00:00	0	0	539	57	157	20	0	0	5	0	1	0	0	0	13	1	7	0	0	0
9:15:00	0	0	539	0	157	0	0	0	5	0	1	0	0	0	13	0	7	0	0	0
16:00:00	0	0	539	0	157	0	0	0	5	0	1	0	0	0	13	0	7	0	0	0
16:15:00	0	0	611	72	179	22	0	0	5	0	1	0	0	0	15	2	8	1	0	0
16:30:00	0	0	677	66	207	28	0	0	5	0	1	0	0	0	15	0	9	1	0	0
16:45:00	0	0	759	82	237	30	0	0	5	0	1	0	0	0	16	1	11	2	0	0
17:00:00	0	0	832	73	257	20	0	0	5	0	1	0	0	0	17	1	11	0	0	0
17:15:00	0	0	907	75	282	25	0	0	5	0	1	0	0	0	18	1	11	0	2	2
17:30:00	0	0	979	72	302	20	0	0	5	0	1	0	0	0	19	1	11	0	2	0
17:45:00	0	0	1027	48	317	15	0	0	6	1	1	0	0	0	19	0	12	1	4	2
18:00:00	0	0	1094	67	327	10	0	0	6	0	1	0	0	0	20	1	12	0	4	0
18:15:00	0	0	1094	0	327	0	0	0	6	0	1	0	0	0	20	0	12	0	4	0
18:15:15	0	0	1094	0	327	0	0	0	6	0	1	0	0	0	20	0	12	0	4	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 12-Sep-19 Site #: 1914700001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 12-Sep-19 Site #: 1914700001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	6	6	23	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	9	3	53	30	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0
7:45:00	12	3	88	35	0	0	0	0	2	1	0	0	2	2	2	1	0	0	0	0
8:00:00	16	4	128	40	0	0	0	0	3	1	0	0	2	0	2	0	0	0	0	0
8:15:00	24	8	159	31	0	0	0	0	5	2	0	0	5	3	6	4	0	0	0	0
8:30:00	36	12	214	55	0	0	0	0	6	1	0	0	5	0	8	2	0	0	5	5
8:45:00	40	4	252	38	0	0	0	0	6	0	0	0	7	2	9	1	0	0	7	2
9:00:00	51	11	293	41	0	0	0	0	6	0	0	0	7	0	9	0	0	0	7	0
9:15:00	51	0	293	0	0	0	0	0	6	0	0	0	7	0	9	0	0	0	7	0
16:00:00	51	0	293	0	0	0	0	0	6	0	0	0	7	0	9	0	0	0	7	0
16:15:00	64	13	384	91	0	0	0	0	6	0	0	0	8	1	11	2	0	0	7	0
16:30:00	82	18	471	87	0	0	0	0	7	1	0	0	8	0	11	0	0	0	7	0
16:45:00	92	10	561	90	0	0	0	0	7	0	0	0	8	0	12	1	0	0	7	0
17:00:00	102	10	639	78	0	0	0	0	7	0	0	0	8	0	12	0	0	0	7	0
17:15:00	108	6	739	100	0	0	0	0	8	1	0	0	8	0	17	5	0	0	7	0
17:30:00	119	11	810	71	0	0	0	0	8	0	0	0	8	0	17	0	0	0	7	0
17:45:00	131	12	876	66	0	0	0	0	9	1	0	0	8	0	17	0	0	0	7	0
18:00:00	137	6	919	43	0	0	0	0	9	0	0	0	8	0	17	0	0	0	7	0
18:15:00	137	0	919	0	0	0	0	0	9	0	0	0	8	0	17	0	0	0	7	0
18:15:15	137	0	919	0	0	0	0	0	9	0	0	0	8	0	17	0	0	0	7	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:45:00
To: 12:45:00

Municipality: Cobourg
Site #: 1914700001
Intersection: King St E & Brook Rd N
TFR File #: 1
Count date: 7-Sep-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

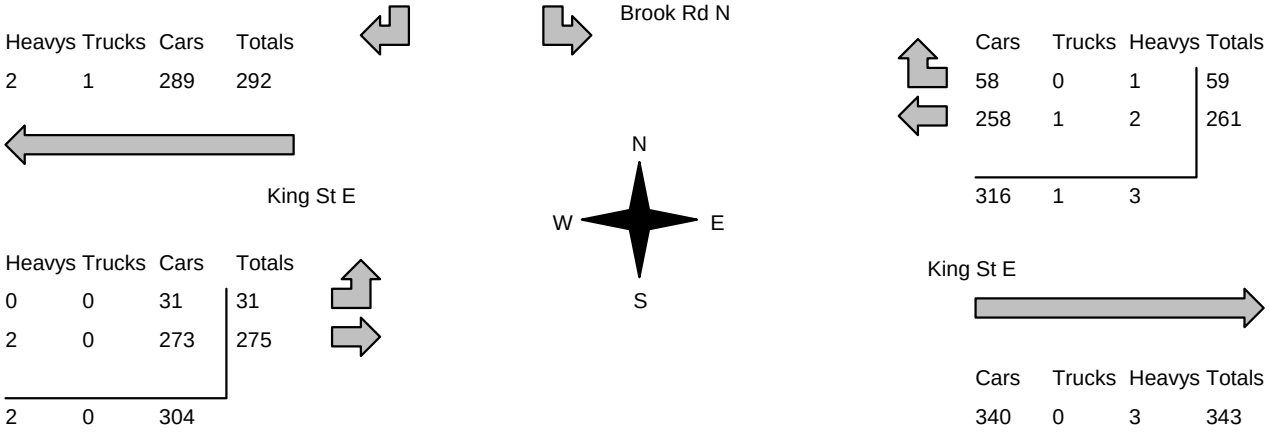
Major Road: King St E runs W/E

North Leg Total: 189
North Entering: 99
North Peds: 4
Peds Cross: ⋈

Heavys	0	1	1
Trucks	0	0	0
Cars	31	67	98
Totals	31	68	

Heavys	1
Trucks	0
Cars	89
Totals	90

East Leg Total: 663
East Entering: 320
East Peds: 0
Peds Cross: ⧖



Heavys	Trucks	Cars	Totals
2	1	289	292

Cars	Trucks	Heavys	Totals
58	0	1	59
258	1	2	261
316	1	3	

Heavys	Trucks	Cars	Totals
0	0	31	31
2	0	273	275
2	0	304	

Cars	Trucks	Heavys	Totals
340	0	3	343

Peds Cross: ⧖
West Peds: 0
West Entering: 306
West Leg Total: 598

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Total Count Diagram

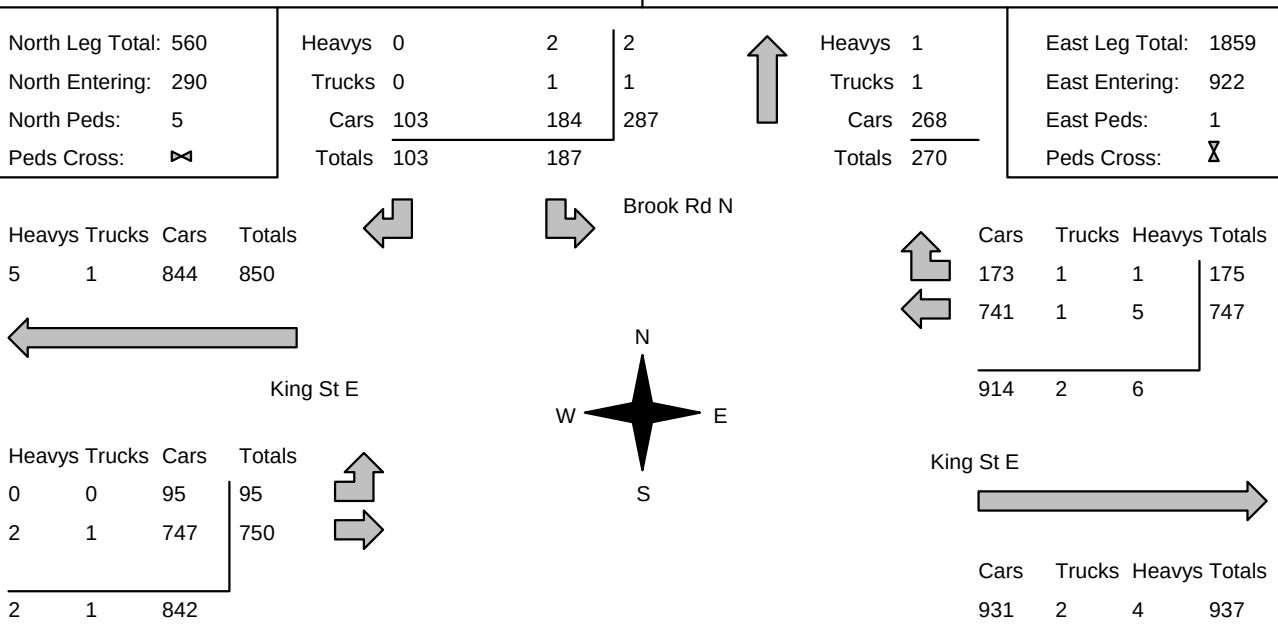
Municipality: Cobourg
Site #: 1914700001
Intersection: King St E & Brook Rd N
TFR File #: 1
Count date: 7-Sep-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: King St E runs W/E



Peds Cross:
West Peds: 0
West Entering: 845
West Leg Total: 1695

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: King St E & Brook Rd N | **Count Date:** 7-Sep-19 | **Municipality:** Cobourg

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
11:00:00	*0*	*0*	*0*	*0*	*0*
12:00:00	*64*	*0*	*39*	*103*	*0*
13:00:00	*73*	*0*	*30*	*103*	*4*
14:00:00	*50*	*0*	*34*	*84*	*1*
Totals:	187	0	103	290	5

North/South Total Approaches: 290

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
11:00:00	*0*	*0*	*0*	*0*	*0*
12:00:00	*0*	*0*	*0*	*0*	*0*
13:00:00	*0*	*0*	*0*	*0*	*0*
14:00:00	*0*	*0*	*0*	*0*	*0*
S Totals:	0	0	0	0	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
11:00:00	*0*	*0*	*0*	*0*	*0*
12:00:00	*0*	*251*	*74*	*325*	*1*
13:00:00	*0*	*251*	*58*	*309*	*0*
14:00:00	*0*	*245*	*43*	*288*	*0*
Totals:	0	747	175	922	1

East/West Total Approaches: 1767

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
11:00:00	*0*	*0*	*0*	*0*	*0*
12:00:00	*36*	*236*	*0*	*272*	*0*
13:00:00	*31*	*261*	*0*	*292*	*0*
14:00:00	*28*	*253*	*0*	*281*	*0*
W Totals:	95	750	0	845	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*11:00*	*12:00*	*13:00*	*14:00*	*0:00*	*0:00*	*0:00*	*0:00*
Crossing Values:	*0*	*65*	*73*	*50*	*0*	*0*	*0*	*0*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 7-Sep-19 Site #: 1914700001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
11:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15:00	16	16	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30:00	30	14	0	0	22	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45:00	44	14	0	0	30	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00:00	64	20	0	0	39	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	80	16	0	0	49	10	0	0	0	0	0	0	0	0	0	0	0	0	3	3
12:30:00	104	24	0	0	55	6	0	0	0	0	0	0	1	1	0	0	0	0	4	1
12:45:00	111	7	0	0	61	6	0	0	0	0	0	0	1	0	0	0	0	0	4	0
13:00:00	136	25	0	0	69	8	0	0	0	0	0	0	1	0	0	0	0	0	4	0
13:15:00	151	15	0	0	76	7	1	1	0	0	0	0	1	0	0	0	0	0	4	0
13:30:00	159	8	0	0	85	9	1	0	0	0	0	0	1	0	0	0	0	0	4	0
13:45:00	169	10	0	0	93	8	1	0	0	0	0	0	2	1	0	0	0	0	4	0
14:00:00	184	15	0	0	103	10	1	0	0	0	0	0	2	0	0	0	0	0	5	1
14:15:00	184	0	0	0	103	0	1	0	0	0	0	0	2	0	0	0	0	0	5	0
14:15:15	184	0	0	0	103	0	1	0	0	0	0	0	2	0	0	0	0	0	5	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 7-Sep-19 Site #: 1914700001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
11:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15:00	0	0	54	54	21	21	0	0	0	0	0	0	0	0	1	1	0	0	0	0
11:30:00	0	0	127	73	39	18	0	0	0	0	0	0	0	0	1	0	0	0	0	0
11:45:00	0	0	183	56	56	17	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:00:00	0	0	247	64	74	18	0	0	1	1	0	0	0	0	3	2	0	0	1	0
12:15:00	0	0	311	64	88	14	0	0	1	0	0	0	0	0	3	0	0	0	1	0
12:30:00	0	0	364	53	102	14	0	0	1	0	0	0	0	0	3	0	0	0	1	0
12:45:00	0	0	441	77	114	12	0	0	1	0	0	0	0	0	3	0	1	1	1	0
13:00:00	0	0	496	55	131	17	0	0	1	0	0	0	0	0	5	2	1	0	1	0
13:15:00	0	0	547	51	142	11	0	0	1	0	0	0	0	0	5	0	1	0	1	0
13:30:00	0	0	613	66	153	11	0	0	1	0	0	0	0	0	5	0	1	0	1	0
13:45:00	0	0	686	73	165	12	0	0	1	0	1	1	0	0	5	0	1	0	1	0
14:00:00	0	0	741	55	173	8	0	0	1	0	1	0	0	0	5	0	1	0	1	0
14:15:00	0	0	741	0	173	0	0	0	1	0	1	0	0	0	5	0	1	0	1	0
14:15:15	0	0	741	0	173	0	0	0	1	0	1	0	0	0	5	0	1	0	1	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 7-Sep-19 Site #: 1914700001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
11:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 7-Sep-19 Site #: 1914700001

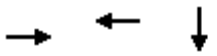
Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
11:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15:00	10	10	49	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30:00	19	9	110	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45:00	30	11	169	59	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
12:00:00	36	6	234	65	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0
12:15:00	51	15	300	66	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
12:30:00	57	6	366	66	0	0	0	0	1	0	0	0	0	0	2	1	0	0	0	0
12:45:00	61	4	442	76	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
13:00:00	67	6	494	52	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
13:15:00	75	8	545	51	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
13:30:00	80	5	602	57	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
13:45:00	85	5	665	63	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
14:00:00	95	10	747	82	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
14:15:00	95	0	747	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
14:15:15	95	0	747	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0

Appendix C:

Synchro Analysis Output

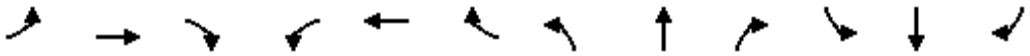
Appendix C1

Existing Condition



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	253	500	193
v/c Ratio	0.30	0.52	0.40
Control Delay	13.9	16.5	22.4
Queue Delay	0.0	0.0	0.0
Total Delay	13.9	16.5	22.4
Queue Length 50th (m)	26.9	59.3	22.9
Queue Length 95th (m)	38.1	76.0	37.6
Internal Link Dist (m)	302.5	49.7	86.1
Turn Bay Length (m)			
Base Capacity (vph)	839	964	482
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.30	0.52	0.40

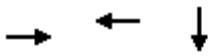
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	175	0	0	329	81	0	0	0	89	0	69
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	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			1.00						0.98	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		1.00			0.97						0.94	
Flt Protected		0.99			1.00						0.97	
Satd. Flow (prot)		1755			1770						1578	
Flt Permitted		0.88			1.00						0.82	
Satd. Flow (perm)		1554			1770						1338	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	40	213	0	0	401	99	0	0	0	109	0	84
RTOR Reduction (vph)	0	0	0	0	9	0	0	0	0	0	28	0
Lane Group Flow (vph)	0	253	0	0	491	0	0	0	0	0	165	0
Confl. Peds. (#/hr)	1					1	7					7
Heavy Vehicles (%)	15%	6%	0%	0%	4%	4%	0%	0%	0%	10%	0%	6%
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.0			54.0						34.0	
Effective Green, g (s)		54.0			54.0						34.0	
Actuated g/C Ratio		0.54			0.54						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		839			955						454	
v/s Ratio Prot					c0.28							
v/s Ratio Perm		0.16									c0.12	
v/c Ratio		0.30			0.51						0.36	
Uniform Delay, d1		12.6			14.6						24.9	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.9			2.0						2.3	
Delay (s)		13.6			16.6						27.1	
Level of Service		B			B						C	
Approach Delay (s)		13.6			16.6			0.0			27.1	
Approach LOS		B			B			A			C	

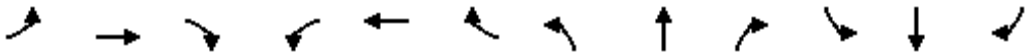
Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	437	436	125
v/c Ratio	0.47	0.45	0.25
Control Delay	16.4	14.7	18.9
Queue Delay	0.0	0.0	0.0
Total Delay	16.4	14.7	18.9
Queue Length 50th (m)	52.2	47.5	13.1
Queue Length 95th (m)	77.9	71.7	27.6
Internal Link Dist (m)	302.5	49.7	86.1
Turn Bay Length (m)			
Base Capacity (vph)	923	978	505
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.47	0.45	0.25

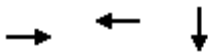
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	363	0	0	299	106	0	0	0	85	0	32
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	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			0.99						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		1.00			0.96						0.96	
Flt Protected		0.99			1.00						0.96	
Satd. Flow (prot)		1855			1789						1733	
Flt Permitted		0.92			1.00						0.79	
Satd. Flow (perm)		1711			1789						1424	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	47	390	0	0	322	114	0	0	0	91	0	34
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	0	0	22	0
Lane Group Flow (vph)	0	437	0	0	423	0	0	0	0	0	103	0
Confl. Peds. (#/hr)	5					5			2	2		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	3%	0%	0%	0%	2%	0%	0%
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.0			54.0						34.0	
Effective Green, g (s)		54.0			54.0						34.0	
Actuated g/C Ratio		0.54			0.54						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		923			966						484	
v/s Ratio Prot					0.24							
v/s Ratio Perm		c0.26									c0.07	
v/c Ratio		0.47			0.44						0.21	
Uniform Delay, d1		14.2			13.9						23.5	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		1.7			1.4						1.0	
Delay (s)		16.0			15.3						24.5	
Level of Service		B			B						C	
Approach Delay (s)		16.0			15.3			0.0			24.5	
Approach LOS		B			B			A			C	

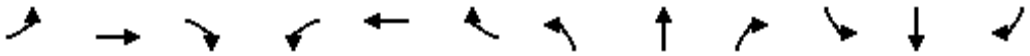
Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	316	330	102
v/c Ratio	0.33	0.33	0.20
Control Delay	14.1	13.3	17.2
Queue Delay	0.0	0.0	0.0
Total Delay	14.1	13.3	17.2
Queue Length 50th (m)	34.2	33.6	9.7
Queue Length 95th (m)	52.3	52.0	22.2
Internal Link Dist (m)	302.5	49.7	86.1
Turn Bay Length (m)			
Base Capacity (vph)	958	991	522
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.33	0.33	0.20

Intersection Summary



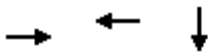
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	275	0	0	261	59	0	0	0	68	0	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0						6.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			0.99						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		1.00			0.98						0.96	
Flt Protected		0.99			1.00						0.97	
Satd. Flow (prot)		1872			1820						1747	
Flt Permitted		0.94			1.00						0.81	
Satd. Flow (perm)		1774			1820						1471	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	32	284	0	0	269	61	0	0	0	70	0	32
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	22	0
Lane Group Flow (vph)	0	316	0	0	322	0	0	0	0	0	80	0
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	2%	0%	0%	0%	1%	0%	0%
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.0			54.0						34.0	
Effective Green, g (s)		54.0			54.0						34.0	
Actuated g/C Ratio		0.54			0.54						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		957			982						500	
v/s Ratio Prot					0.18							
v/s Ratio Perm		c0.18									c0.05	
v/c Ratio		0.33			0.33						0.16	
Uniform Delay, d1		12.9			12.9						23.0	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.9			0.9						0.7	
Delay (s)		13.8			13.7						23.7	
Level of Service		B			B						C	
Approach Delay (s)		13.8			13.7			0.0			23.7	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Appendix C2

Background Condition



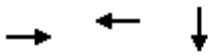
Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	279	552	213
v/c Ratio	0.34	0.57	0.44
Control Delay	14.4	17.7	23.8
Queue Delay	0.0	0.0	0.0
Total Delay	14.4	17.7	23.8
Queue Length 50th (m)	30.4	68.5	26.5
Queue Length 95th (m)	42.4	86.7	42.1
Internal Link Dist (m)	302.5	49.7	86.1
Turn Bay Length (m)			
Base Capacity (vph)	827	964	482
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.34	0.57	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	193	0	0	363	89	0	0	0	98	0	76
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	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			1.00						0.98	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		1.00			0.97						0.94	
Flt Protected		0.99			1.00						0.97	
Satd. Flow (prot)		1755			1770						1577	
Flt Permitted		0.87			1.00						0.83	
Satd. Flow (perm)		1531			1770						1338	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	44	235	0	0	443	109	0	0	0	120	0	93
RTOR Reduction (vph)	0	0	0	0	9	0	0	0	0	0	28	0
Lane Group Flow (vph)	0	279	0	0	543	0	0	0	0	0	185	0
Confl. Peds. (#/hr)	1					1	7					7
Heavy Vehicles (%)	15%	6%	0%	0%	4%	4%	0%	0%	0%	10%	0%	6%
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.0			54.0						34.0	
Effective Green, g (s)		54.0			54.0						34.0	
Actuated g/C Ratio		0.54			0.54						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		826			955						454	
v/s Ratio Prot					c0.31							
v/s Ratio Perm		0.18									c0.14	
v/c Ratio		0.34			0.57						0.41	
Uniform Delay, d1		12.9			15.3						25.3	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		1.1			2.5						2.7	
Delay (s)		14.0			17.7						28.0	
Level of Service		B			B						C	
Approach Delay (s)		14.0			17.7			0.0			28.0	
Approach LOS		B			B			A			C	

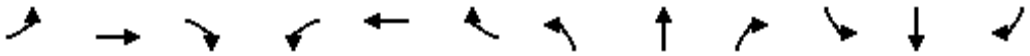
Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	484	481	139
v/c Ratio	0.53	0.49	0.28
Control Delay	17.5	15.6	19.9
Queue Delay	0.0	0.0	0.0
Total Delay	17.5	15.6	19.9
Queue Length 50th (m)	60.3	54.6	15.3
Queue Length 95th (m)	89.7	81.5	30.9
Internal Link Dist (m)	302.5	49.7	86.1
Turn Bay Length (m)			
Base Capacity (vph)	912	978	503
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.53	0.49	0.28

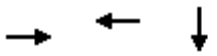
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	401	0	0	330	117	0	0	0	94	0	35
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	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			0.99						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		1.00			0.96						0.96	
Flt Protected		0.99			1.00						0.96	
Satd. Flow (prot)		1856			1789						1733	
Flt Permitted		0.91			1.00						0.79	
Satd. Flow (perm)		1690			1789						1416	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	53	431	0	0	355	126	0	0	0	101	0	38
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	0	0	22	0
Lane Group Flow (vph)	0	484	0	0	468	0	0	0	0	0	117	0
Confl. Peds. (#/hr)	5					5			2	2		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	3%	0%	0%	0%	2%	0%	0%
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.0			54.0						34.0	
Effective Green, g (s)		54.0			54.0						34.0	
Actuated g/C Ratio		0.54			0.54						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		912			966						481	
v/s Ratio Prot					0.26							
v/s Ratio Perm		c0.29									c0.08	
v/c Ratio		0.53			0.48						0.24	
Uniform Delay, d1		14.8			14.3						23.7	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		2.2			1.7						1.2	
Delay (s)		17.0			16.1						24.9	
Level of Service		B			B						C	
Approach Delay (s)		17.0			16.1			0.0			24.9	
Approach LOS		B			B			A			C	

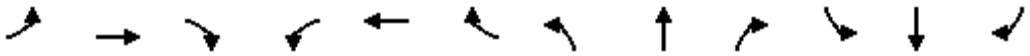
Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	348	364	112
v/c Ratio	0.37	0.37	0.22
Control Delay	14.6	13.8	17.8
Queue Delay	0.0	0.0	0.0
Total Delay	14.6	13.8	17.8
Queue Length 50th (m)	38.6	38.2	11.2
Queue Length 95th (m)	58.5	58.3	24.3
Internal Link Dist (m)	302.5	49.7	86.1
Turn Bay Length (m)			
Base Capacity (vph)	952	991	518
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.37	0.22

Intersection Summary



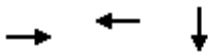
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	304	0	0	288	65	0	0	0	75	0	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0						6.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			0.99						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		1.00			0.98						0.96	
Flt Protected		0.99			1.00						0.97	
Satd. Flow (prot)		1872			1820						1747	
Flt Permitted		0.94			1.00						0.81	
Satd. Flow (perm)		1764			1820						1463	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	35	313	0	0	297	67	0	0	0	77	0	35
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	22	0
Lane Group Flow (vph)	0	348	0	0	356	0	0	0	0	0	90	0
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	2%	0%	0%	0%	1%	0%	0%
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.0			54.0						34.0	
Effective Green, g (s)		54.0			54.0						34.0	
Actuated g/C Ratio		0.54			0.54						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		952			982						497	
v/s Ratio Prot					0.20							
v/s Ratio Perm		c0.20									c0.06	
v/c Ratio		0.37			0.36						0.18	
Uniform Delay, d1		13.2			13.2						23.2	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		1.1			1.0						0.8	
Delay (s)		14.3			14.2						24.0	
Level of Service		B			B						C	
Approach Delay (s)		14.3			14.2			0.0			24.0	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

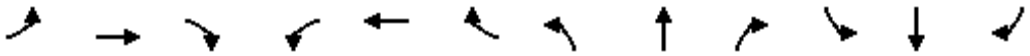
Appendix C3

Total Condition



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	327	610	245
v/c Ratio	0.48	0.63	0.50
Control Delay	17.3	19.2	24.6
Queue Delay	0.0	0.0	0.0
Total Delay	17.3	19.2	24.6
Queue Length 50th (m)	39.3	79.9	30.8
Queue Length 95th (m)	54.9	99.9	47.7
Internal Link Dist (m)	302.5	49.7	86.1
Turn Bay Length (m)			
Base Capacity (vph)	679	964	491
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.48	0.63	0.50

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	218	0	0	401	99	0	0	0	104	0	97
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	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			1.00						0.98	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		1.00			0.97						0.93	
Flt Protected		0.99			1.00						0.97	
Satd. Flow (prot)		1748			1770						1570	
Flt Permitted		0.71			1.00						0.84	
Satd. Flow (perm)		1258			1770						1348	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	61	266	0	0	489	121	0	0	0	127	0	118
RTOR Reduction (vph)	0	0	0	0	9	0	0	0	0	0	34	0
Lane Group Flow (vph)	0	327	0	0	601	0	0	0	0	0	211	0
Confl. Peds. (#/hr)	1					1	7					7
Heavy Vehicles (%)	15%	6%	0%	0%	4%	4%	0%	0%	0%	10%	0%	6%
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.0			54.0						34.0	
Effective Green, g (s)		54.0			54.0						34.0	
Actuated g/C Ratio		0.54			0.54						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		679			955						458	
v/s Ratio Prot					c0.34							
v/s Ratio Perm		0.26									c0.16	
v/c Ratio		0.48			0.63						0.46	
Uniform Delay, d1		14.3			16.0						25.8	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		2.4			3.1						3.3	
Delay (s)		16.7			19.2						29.2	
Level of Service		B			B						C	
Approach Delay (s)		16.7			19.2			0.0			29.2	
Approach LOS		B			B			A			C	

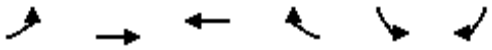
Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	50	34	109	40	49	151
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)	54	37	118	43	53	164
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			110			
pX, platoon unblocked						
vC, conflicting volume	411	140			162	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	411	140			162	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	96			96	
cM capacity (veh/h)	575	908			1417	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	91	162	217
Volume Left	54	0	53
Volume Right	37	43	0
cSH	675	1700	1417
Volume to Capacity	0.14	0.10	0.04
Queue Length 95th (m)	3.7	0.0	0.9
Control Delay (s)	11.2	0.0	2.1
Lane LOS	B		A
Approach Delay (s)	11.2	0.0	2.1
Approach LOS	B		

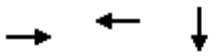
Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	63	259	404	114	73	96
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	68	282	439	124	79	104
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		74				
pX, platoon unblocked					0.92	
vC, conflicting volume	563				920	501
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	563				868	501
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				71	82
cM capacity (veh/h)	1008				276	570

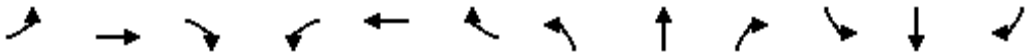
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	350	563	184
Volume Left	68	0	79
Volume Right	0	124	104
cSH	1008	1700	391
Volume to Capacity	0.07	0.33	0.47
Queue Length 95th (m)	1.7	0.0	19.5
Control Delay (s)	2.3	0.0	22.1
Lane LOS	A		C
Approach Delay (s)	2.3	0.0	22.1
Approach LOS			C

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	500	492	146
v/c Ratio	0.56	0.50	0.29
Control Delay	18.2	15.8	20.4
Queue Delay	0.0	0.0	0.0
Total Delay	18.2	15.8	20.4
Queue Length 50th (m)	63.6	56.4	16.4
Queue Length 95th (m)	94.8	84.2	32.5
Internal Link Dist (m)	302.5	49.7	86.1
Turn Bay Length (m)			
Base Capacity (vph)	896	978	503
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.56	0.50	0.29

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	411	0	0	338	120	0	0	0	97	0	39
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	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			0.99						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		1.00			0.96						0.96	
Flt Protected		0.99			1.00						0.97	
Satd. Flow (prot)		1855			1789						1731	
Flt Permitted		0.89			1.00						0.79	
Satd. Flow (perm)		1662			1789						1418	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	58	442	0	0	363	129	0	0	0	104	0	42
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	0	0	22	0
Lane Group Flow (vph)	0	500	0	0	479	0	0	0	0	0	124	0
Confl. Peds. (#/hr)	5					5			2	2		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	3%	0%	0%	0%	2%	0%	0%
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.0			54.0						34.0	
Effective Green, g (s)		54.0			54.0						34.0	
Actuated g/C Ratio		0.54			0.54						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		897			966						482	
v/s Ratio Prot					0.27							
v/s Ratio Perm		c0.30									c0.09	
v/c Ratio		0.56			0.50						0.26	
Uniform Delay, d1		15.1			14.5						23.9	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		2.5			1.8						1.3	
Delay (s)		17.6			16.3						25.2	
Level of Service		B			B						C	
Approach Delay (s)		17.6			16.3			0.0			25.2	
Approach LOS		B			B			A			C	

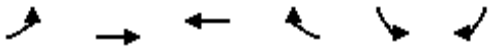
Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	21	23	148	26	20	115
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)	23	25	161	28	22	125
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			110			
pX, platoon unblocked						
vC, conflicting volume	343	175			189	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	343	175			189	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	97			98	
cM capacity (veh/h)	643	868			1385	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	48	189	147
Volume Left	23	0	22
Volume Right	25	28	0
cSH	744	1700	1385
Volume to Capacity	0.06	0.11	0.02
Queue Length 95th (m)	1.6	0.0	0.4
Control Delay (s)	10.2	0.0	1.2
Lane LOS	B		A
Approach Delay (s)	10.2	0.0	1.2
Approach LOS	B		

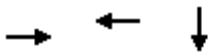
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	44	464	401	64	48	57
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	504	436	70	52	62
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		74				
pX, platoon unblocked					0.83	
vC, conflicting volume	505				1071	471
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	505				985	471
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				76	90
cM capacity (veh/h)	1059				219	593

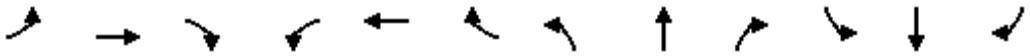
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	552	505	114
Volume Left	48	0	52
Volume Right	0	70	62
cSH	1059	1700	333
Volume to Capacity	0.05	0.30	0.34
Queue Length 95th (m)	1.1	0.0	11.9
Control Delay (s)	1.2	0.0	21.3
Lane LOS	A		C
Approach Delay (s)	1.2	0.0	21.3
Approach LOS			C

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	376	384	125
v/c Ratio	0.40	0.39	0.24
Control Delay	15.2	14.1	18.7
Queue Delay	0.0	0.0	0.0
Total Delay	15.2	14.1	18.7
Queue Length 50th (m)	42.8	41.0	13.1
Queue Length 95th (m)	64.2	62.0	27.4
Internal Link Dist (m)	302.5	49.7	86.1
Turn Bay Length (m)			
Base Capacity (vph)	935	991	520
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.40	0.39	0.24

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	322	0	0	303	70	0	0	0	80	0	42
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	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			0.99						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		1.00			0.97						0.95	
Flt Protected		0.99			1.00						0.97	
Satd. Flow (prot)		1871			1819						1743	
Flt Permitted		0.92			1.00						0.81	
Satd. Flow (perm)		1731			1819						1465	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	44	332	0	0	312	72	0	0	0	82	0	43
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	22	0
Lane Group Flow (vph)	0	376	0	0	376	0	0	0	0	0	103	0
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	2%	0%	0%	0%	1%	0%	0%
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.0			54.0						34.0	
Effective Green, g (s)		54.0			54.0						34.0	
Actuated g/C Ratio		0.54			0.54						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		934			982						498	
v/s Ratio Prot					0.21							
v/s Ratio Perm		c0.22									c0.07	
v/c Ratio		0.40			0.38						0.21	
Uniform Delay, d1		13.5			13.3						23.4	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		1.3			1.1						0.9	
Delay (s)		14.8			14.5						24.4	
Level of Service		B			B						C	
Approach Delay (s)		14.8			14.5			0.0			24.4	
Approach LOS		B			B			A			C	

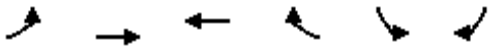
Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	31	28	81	32	28	91
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)	34	30	88	35	30	99
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			110			
pX, platoon unblocked						
vC, conflicting volume	265	105			123	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	265	105			123	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	97			98	
cM capacity (veh/h)	709	949			1464	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	64	123	129
Volume Left	34	0	30
Volume Right	30	35	0
cSH	806	1700	1464
Volume to Capacity	0.08	0.07	0.02
Queue Length 95th (m)	2.1	0.0	0.5
Control Delay (s)	9.9	0.0	1.9
Lane LOS	A		A
Approach Delay (s)	9.9	0.0	1.9
Approach LOS	A		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	101	301	297	87	110	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	327	323	95	120	83
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		74				
pX, platoon unblocked					0.89	
vC, conflicting volume	417				917	370
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	417				844	370
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				55	88
cM capacity (veh/h)	1142				268	676

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	437	417	202
Volume Left	110	0	120
Volume Right	0	95	83
cSH	1142	1700	356
Volume to Capacity	0.10	0.25	0.57
Queue Length 95th (m)	2.5	0.0	26.9
Control Delay (s)	2.9	0.0	27.6
Lane LOS	A		D
Approach Delay (s)	2.9	0.0	27.6
Approach LOS			D

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		