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September 28, 2020

Ms. Brooke Gillispie
Northumberland County
555 Courthouse Rd
Cobourg, ON
K9A 5J6

Dear Ms. Gillispie,

Reference: Residential Development – Townhouses
265 – 327 Elgin St, Cobourg, ON
Traffic Brief
Project Nº 2141-20

Asurza Engineers Ltd. was retained by the proponent to undertake a traffic impact review for the proposed residential development to be located at the southeast quadrant of the Elgin St. E/D'Arcy St. intersection, Town of Cobourg. This analysis is required to meet the County of Northumberland requirement for such in relation to the developer application for the proposed development.

1. The proposed Development

The site currently holds 9 residential two-storey buildings. Each building with two dwelling units making a total of 18 units. All units are currently occupied. The developer is planning the redevelopment of the site by removing the existing buildings and construct 4 building blocks with 10 residential units each one (townhouse type); therefore, a total of 40 dwelling units is planned for the site.

The subject site will have a parking lot at the rear of the buildings. The site will be served with two driveways next to Elgin St E. for access.

Figure 1: *Site Location.*

2. Existing Traffic Conditions

Elgin St. E (CR20) is an arterial road with 4-lane (2 lanes per direction); the road reduces to two-lane (one lane per direction) easterly of D'Arcy St. Elgin St. E. shows an urban cross-section with sidewalks, curb & gutters and catchbasins for road drainage. The urban environment changes to rural further east. The posted speed is 50 km/h within the study area; however, the regulatory speed reduces to 40 km/h in proximity to D'Arcy St. when flashing beacons are active; this is given the school activity in the area.

D'Arcy St. is a two-lane urban road (one lane per direction). D'Arcy St. intersect Elgin St. E to form a 4-leg intersection controlled by stop signs for all approaches. South of Elgin St. E., the D'Arcy St. posted speed is 40 km/h; and North of Elgin St. E. is posted to 50 km/h.

Birchwood Trail is also an urban two-lane roadway that intersects Elgin St. E. to form a 4-leg intersection controlled by traffic signals. The south leg of the intersection is basically a long driveway for a set of businesses. The posted speed for Birchwood Trail is 40 km/h.

Brook Rd. N. is a two-lane rural road with granular shoulders and ditches for road drainage. Brook Rd. N. intersects Elgin St. E. to form a "T" type intersection; a stop sign is posted on Brook Rd. N. The road has a regulatory posted speed limit of 60 km/h.

The County of Northumberland provided traffic data for Elgin St. E.; however, the information was not proper to obtain traffic turning volumes at the involved intersections. Our company performed traffic movements counts on September 14 and 15 for the morning and afternoon peak hours.

Due to some disturbance to regular traffic volumes caused by Covid-19 and the restrictions imposed on the province, it was initially planned to use the field counts to obtain turning proportions and apply these proportions to the registered traffic data provided by the County; however, traffic volumes from our field counts resulted in a significant greater volumes for Elgin St. E. than those registered by the County; therefore, our counts were used for this analysis as they represent the worst case scenario.

The following intersections are part of this study:

- Elgin St. E / Birchwood Trail – Intersection controlled by traffic signals
- Elgin St. E / D'Arcy St – Intersection controlled by stop sign at all approaches
- Elgin St. E / Brook Rd. N – Intersection controlled by stop sign on Brook Rd. N

The existing traffic volumes for the morning and afternoon peak hours are shown in the following figures:

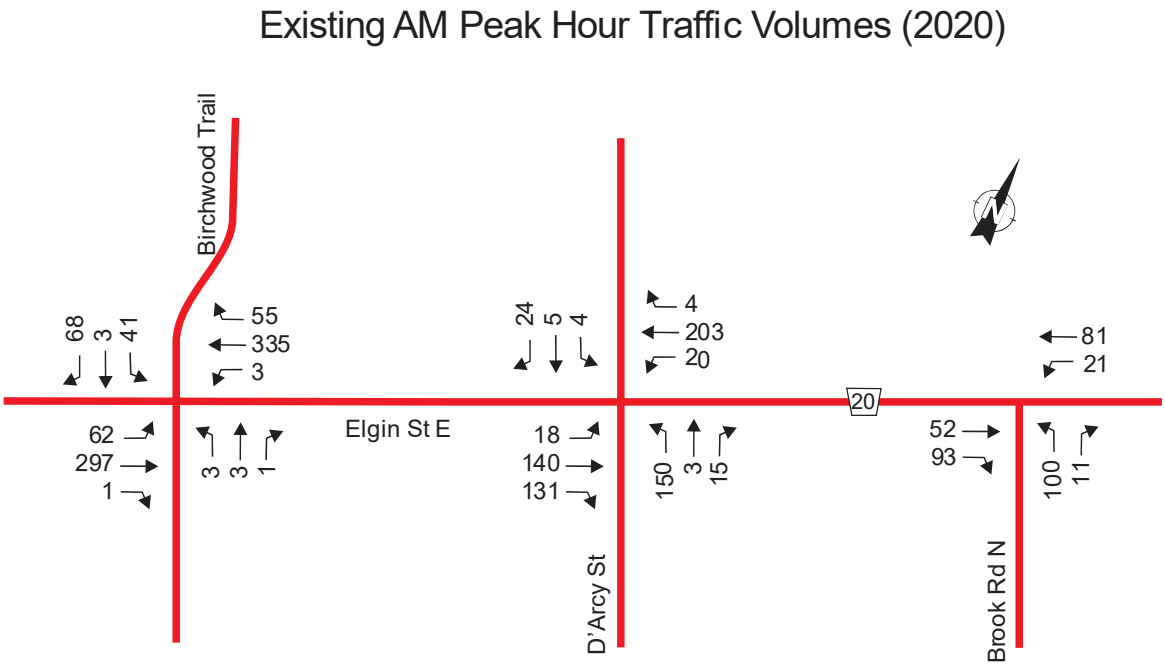


Figure 2: *Existing AM Peak Hour Volumes – Year 2020.*

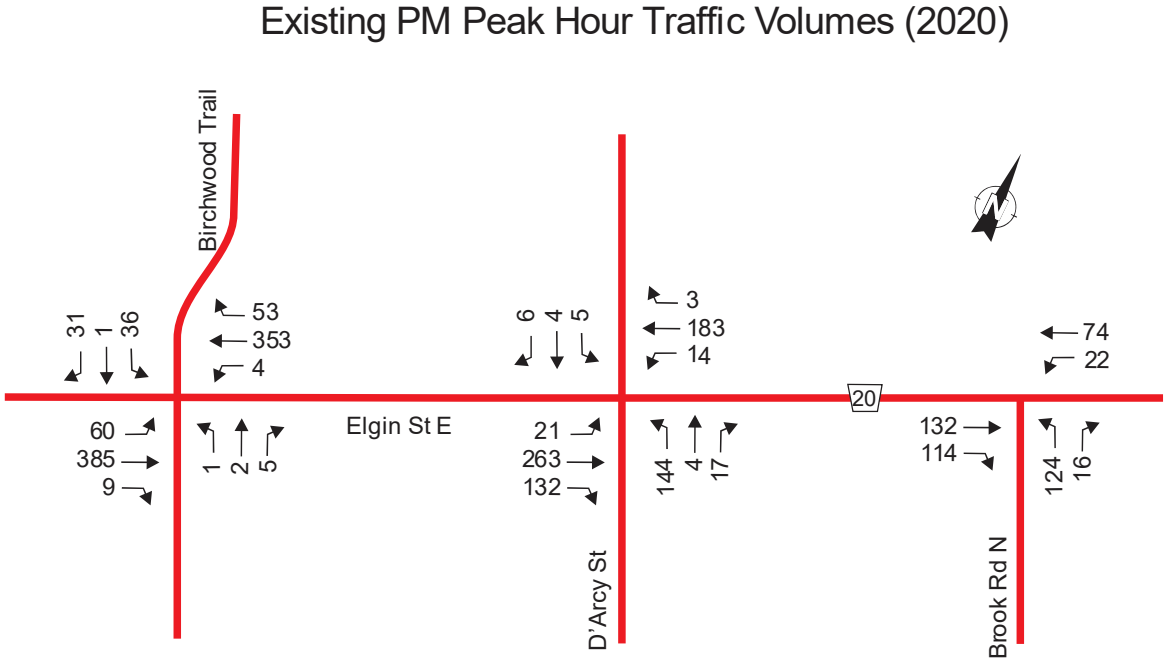


Figure 3: *Existing PM Peak Hour Volumes – Year 2020.*

Based on the existing traffic volumes, traffic operations for the involved intersections are shown in the following table:

		Intersection Capacity - Existing 2020							
		AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	Q_{95} (m)	LOS	V/C	Delay (s)	Q_{95} (m)	LOS
Elgin St E / Birchwood Trail	EB-L	0.13	6.0	7.0	A	0.09	5.3	6.6	A
	EB-TR	0.18	6.5	14.1	A	0.17	5.4	17.5	A
	WB-L	0.01	13.0	1.7	B	0.01	12.5	1.9	B
	WB-TR	0.23	11.4	26.6	B	0.2	10.4	27.0	B
	NB-LTR	0.02	16.3	3.1	B	0.02	13.1	3.0	B
	SB-TL	0.15	19.6	11.1	B	0.12	18.4	9.8	B
	SB-R	0.17	6.4	8.1	A	0.08	7.7	5.4	A
	Overall	0.23	9.4	-	A	0.20	8.2	-	A
Elgin St E / D'Arcy St	EB-LT	0.27	9.5	24.1	A	0.46	11.8	22.5	B
	EB-R	0.19	7.8	17.0	A	0.19	7.5	15.9	A
	WB-LTR	0.35	11.0	21.6	B	0.31	10.5	18.8	B
	NB-LTR	0.29	10.9	23.4	B	0.28	10.8	15.2	B
	SB-LTR	0.05	8.5	12.1	A	0.03	8.8	10.3	A
Elgin St E / Brook Rd N	EB-TR	0.09	0.0	0.0	A	0.16	0.0	0.0	A
	WB-TL	0.02	1.7	0.4	A	0.02	1.9	0.4	A
	NB-LR	0.16	10.8	4.4	B	0.23	12.0	6.7	B

Table 1: *Existing Intersection Capacity.*

The traffic signal timing for the Elgin St E / Birchwood Trail intersection was provided by the County; however, the timing sheet was not complete to determine the existing timing setup; for purposes of this study, an assumed cycle length of 70 s. was used. Minimum greens were based on the Ontario Traffic Manual (OTM) Book 12.

In general, results from current traffic intersection capacity analysis show good to very good operations for turning volumes, with level of service A or B for the morning and afternoon peak hours at all intersections.

3. Traffic Generation

Estimation of trips generated by the proposed development was derived from the Trip Generation Manual, 10th Edition, published by the Institute of Transportation Engineers (ITE). The land use which most closely describes the proposed development is Land Use 220 Multifamily Housing (Low Rise).

According to the ITE Trip Generation Manual, Low-rise multifamily housing includes apartments, townhouses, and condominiums with buildings that have one or two levels (floors).

Based on the proposed 40 units, the trip rates and estimated number of trips generated by the proposed development is shown in the following table:

TRIP GENERATION RATES BY LAND USE								
ITE Code	ITE Land Use	Unit of Measure	AM Peak Hour			PM Peak Hour		
			Rate	In	Out	Rate	In	Out
220	Multifamily Housing (Low Rise)	Dwelling Units	0.46	23%	77%	0.56	63%	37%

ESTIMATED NUMBER OF TRIPS BY LAND USE								
ITE Code	ITE Land Use	Total Units	AM Peak Hour			PM Peak Hour		
			Trips	In	Out	Trips	In	Out
220	Multifamily Housing (Low Rise)	40	18	4	14	22	14	8
220	Multifamily Housing (Low Rise)	18	8	2	6	10	6	4
Total New Trips			10	2	8	12	8	4

Table 2: *Estimation of Trips Generated by the Proposed Development.*

However, it is necessary to remove the trips from the existing residential units (18 units) which are currently occupied. As a result, the additional new trips is estimated to 10 for the morning peak hour and 12 for the afternoon peak hour.

4. Trip Distribution and Assignment

Distribution of the trips generated by the proposed residential development were distributed in the same proportion as the existing traffic patterns:

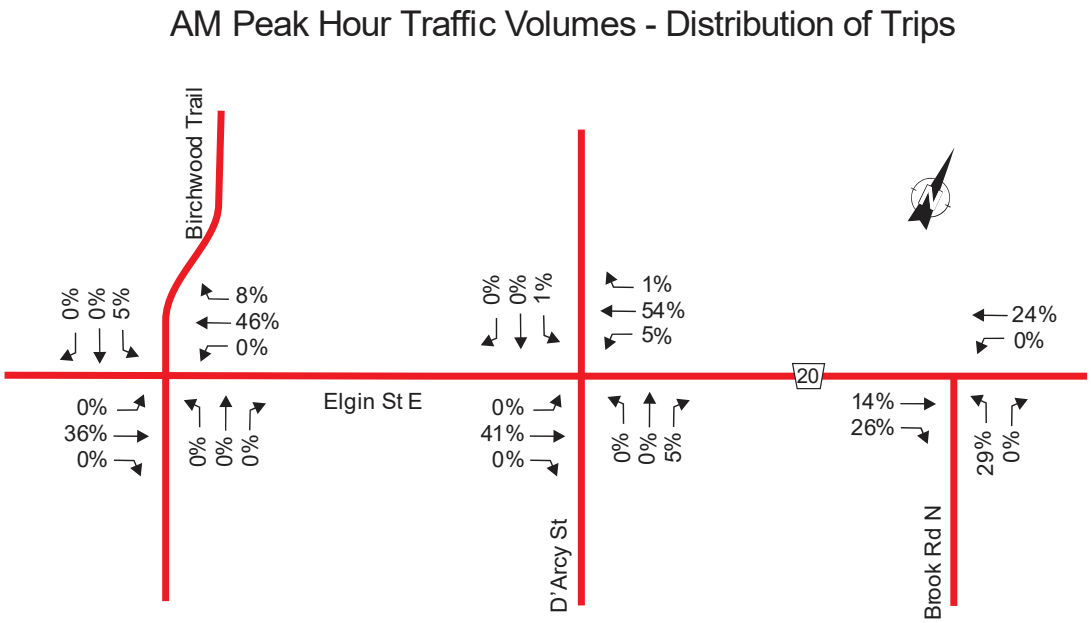


Figure 4: *AM Peak Hour Distribution of Generated Trips.*

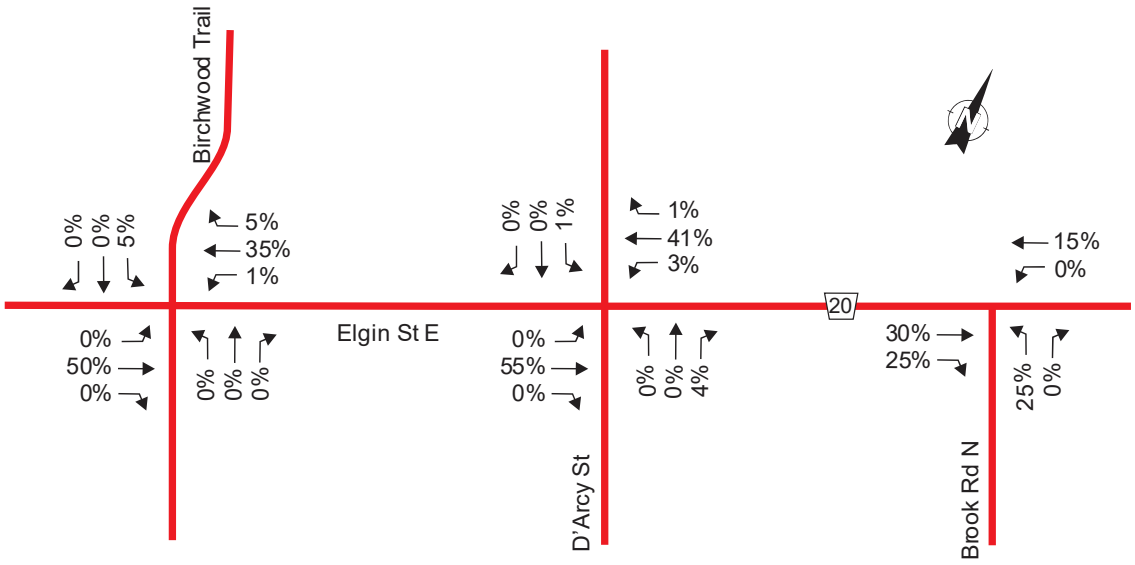


Figure 5: *PM Peak Hour Distribution of Generated Trips.*

Based on the distribution of trips, the estimated additional trips generated by the proposed development are shown in the following figures:

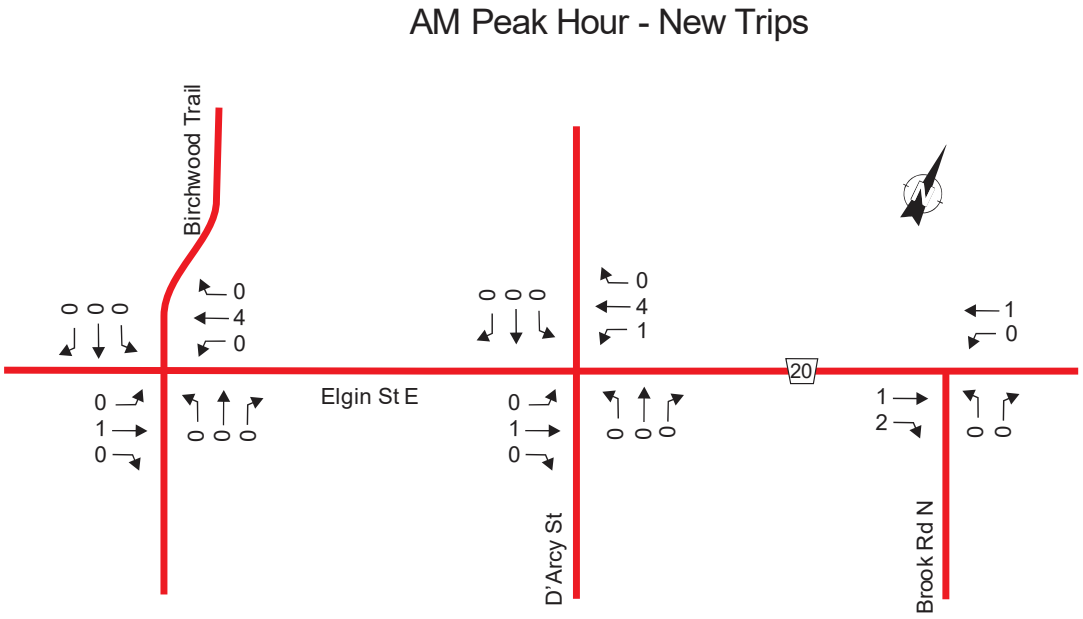


***Figure 6:** AM Peak Hour Generated New Trips.*

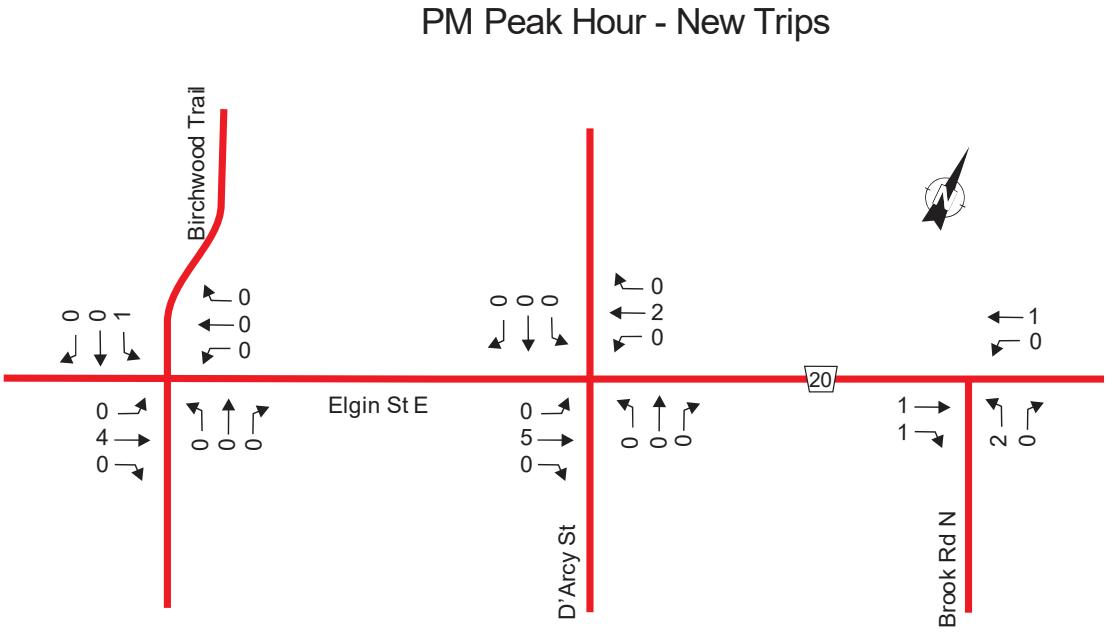


***Figure 7:** PM Peak Hour Generated New Trips.*

5. Background Traffic Volumes

It is expected the build out of the proposed development is for the year 2022. In order to obtain the background traffic volumes for the year 2022 and for the year 2027 (5 years after build out), existing traffic volumes were projected using the annual growth of 2.0%. Background traffic volumes for the year 2022 and 2027 are shown in the following figures:

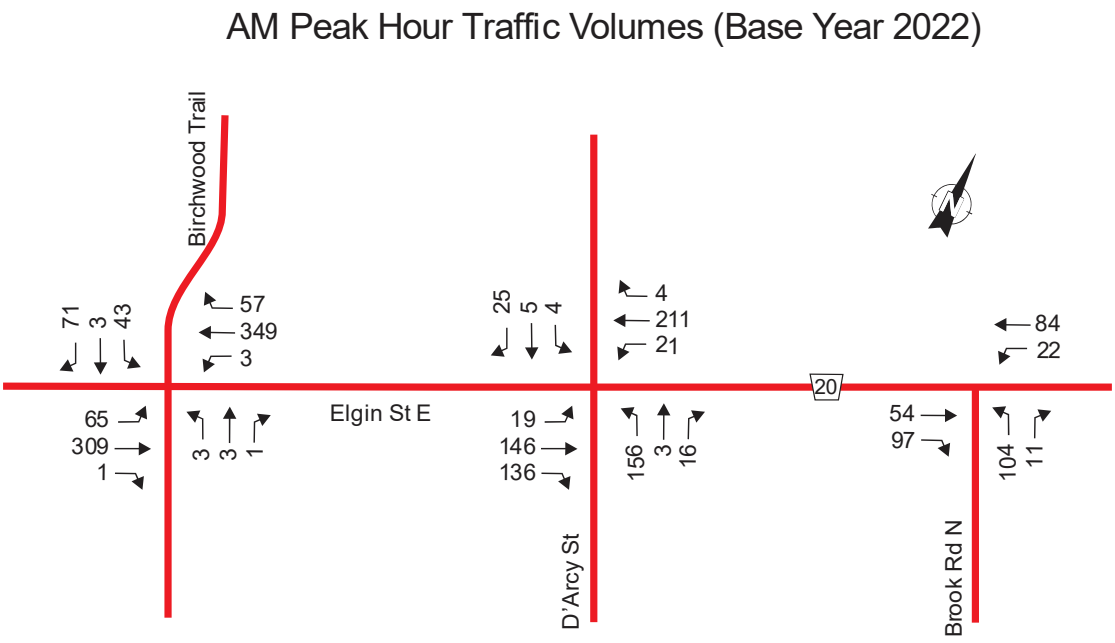


Figure 8: *AM Background Traffic Volumes – Year 2022.*

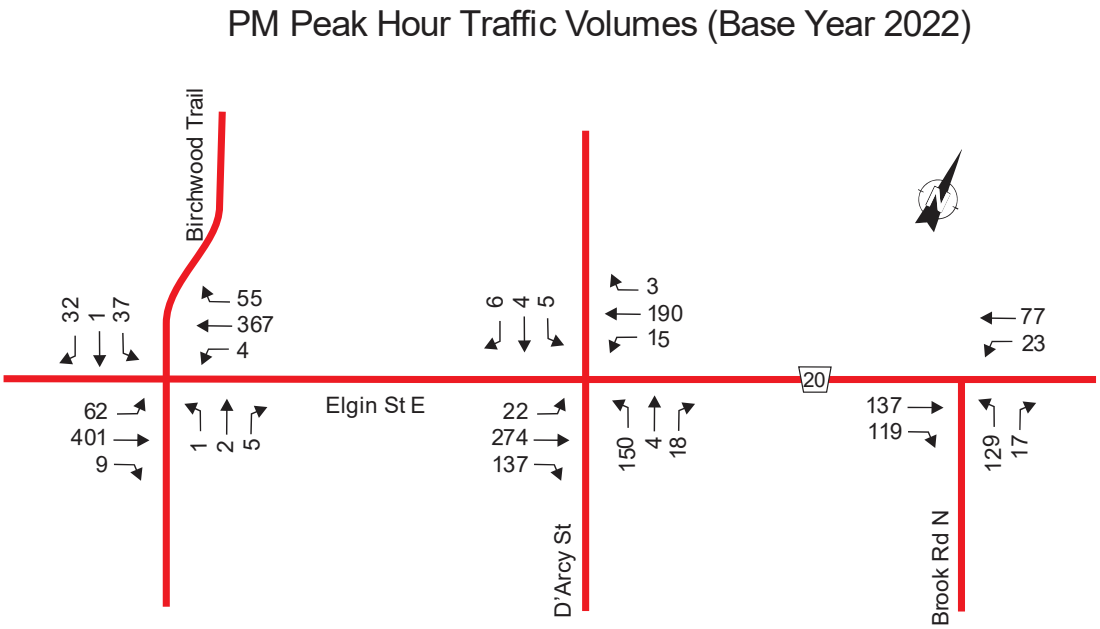


Figure 9: *PM Background Traffic Volumes – Year 2022.*

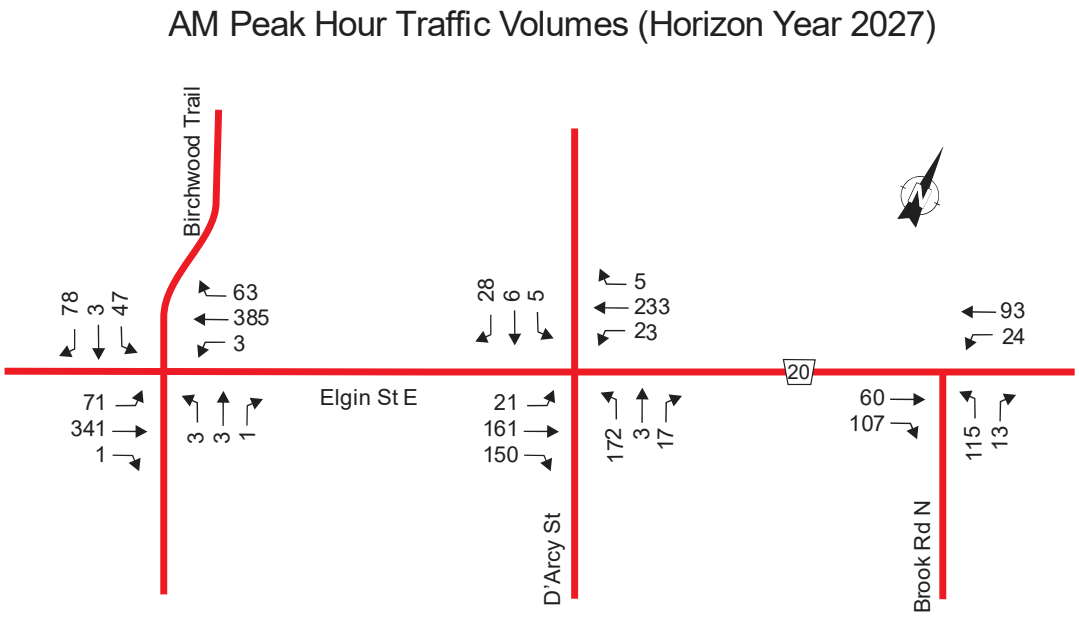


Figure 10: *AM Background Traffic Volumes – Year 2027.*

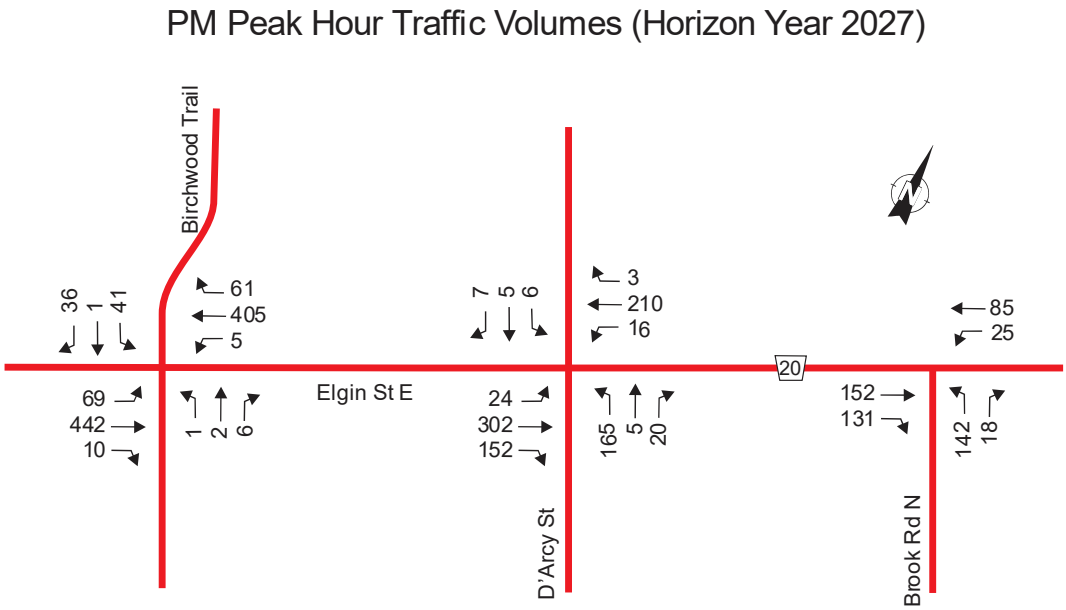


Figure 11: *PM Background Traffic Volumes – Year 2027.*

6. Total Traffic Volumes

The total traffic volumes are found by adding the background traffic volumes plus the estimated new trips. The total traffic volumes for the base year 2022 and horizon year 2027 are shown in the following figures:

AM Peak Hour Total Volumes (Base Year 2022)

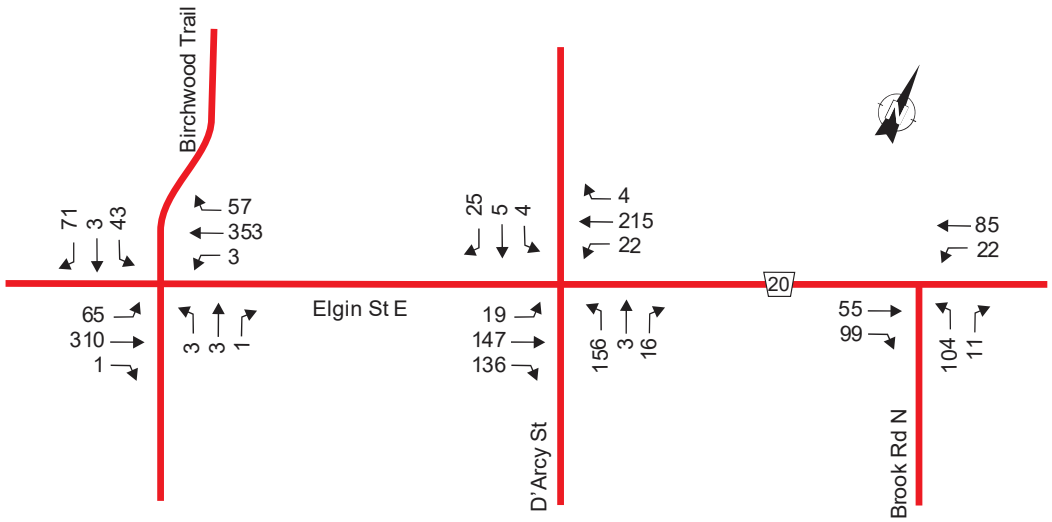


Figure 12: *AM Total Traffic Volumes – Base Year 2022.*

PM Peak Hour Total Volumes (Base Year 2022)

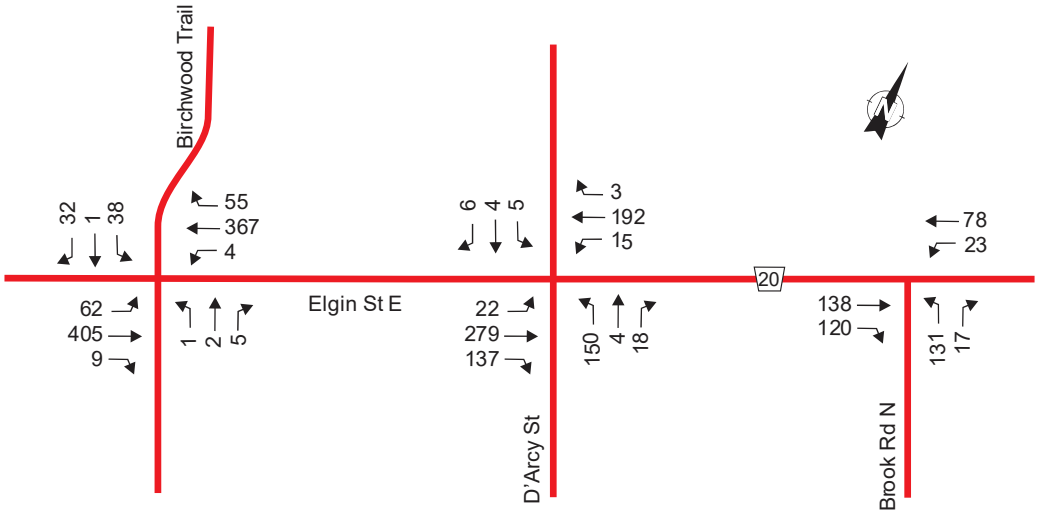


Figure 13: *PM Total Traffic Volumes – Base Year 2022.*

AM Peak Hour Total Volumes (Horizon Year 2027)

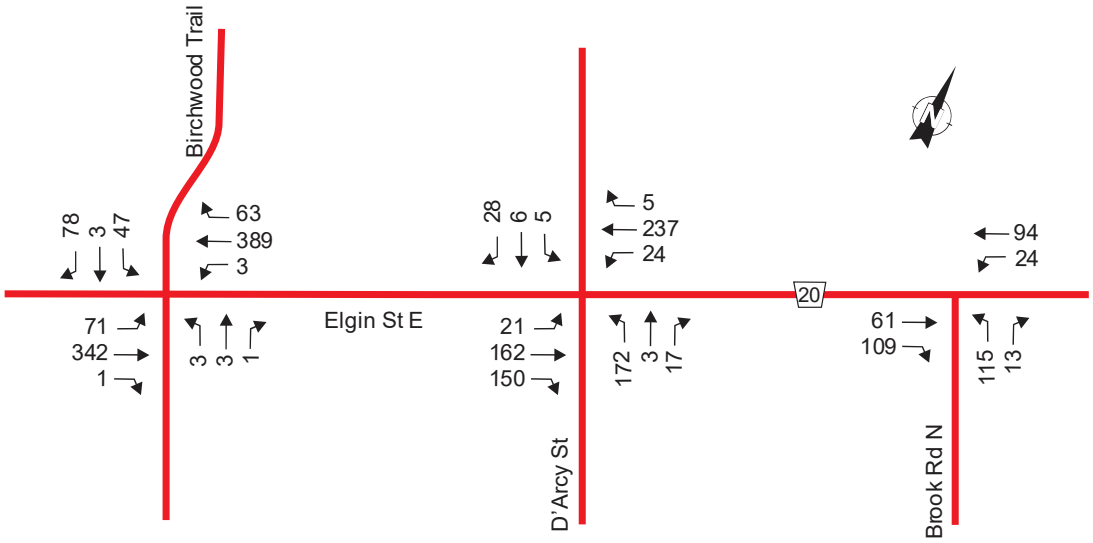


Figure 14: *AM Total Traffic Volumes – Horizon Year 2027.*

PM Peak Hour Total Volumes (Horizon Year 2027)

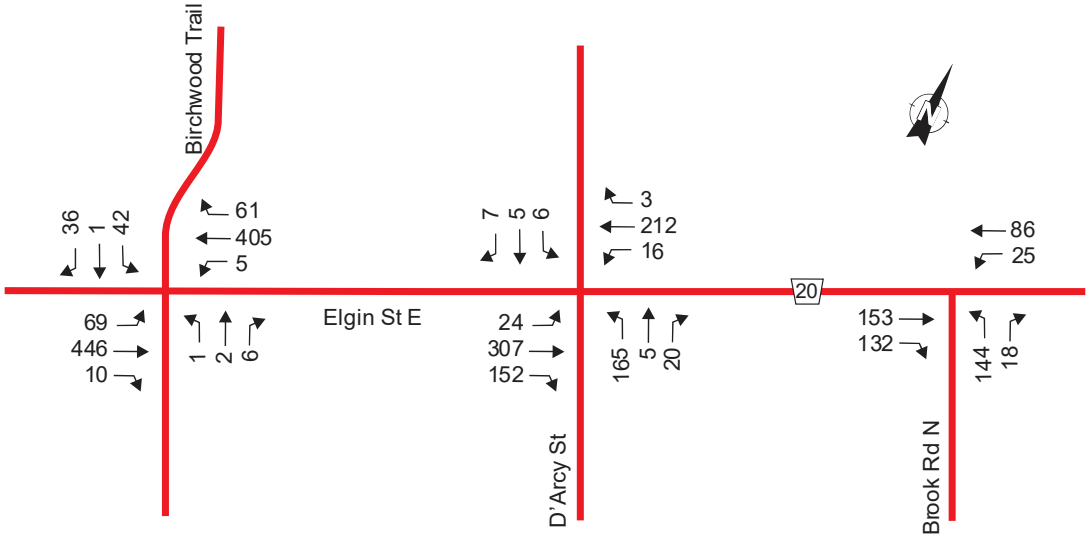


Figure 15: *PM Total Traffic Volumes – Horizon Year 2027.*

The total volumes traffic operations for the years 2022 and 2027 are shown in the following table:

		Intersection Capacity - Total Volumes 2022								Intersection Capacity - Total Volumes 2027							
		AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	Q_{95} (m)	LOS	V/C	Delay (s)	Q_{95} (m)	LOS	V/C	Delay (s)	Q_{95} (m)	LOS	V/C	Delay (s)	Q_{95} (m)	LOS
Elgin St E / Birchwood Trail	EB-L	0.14	6.2	7.3	A	0.09	5.3	6.8	A	0.16	6.3	7.8	A	0.11	5.4	7.4	A
	EB-TR	0.19	6.6	14.7	A	0.18	5.4	18.4	A	0.21	6.7	16.3	A	0.19	5.5	20.3	A
	WB-L	0.01	13.0	1.7	B	0.01	12.5	1.9	B	0.01	13.0	1.7	B	0.01	12.6	2.2	B
	WB-TR	0.26	12.6	26.8	B	0.21	10.4	28.2	B	0.27	12.0	31.5	B	0.24	10.6	31.5	B
	NB-LTR	0.02	16.3	3.1	B	0.02	13.1	3.0	B	0.02	16.3	3.1	B	0.02	12.3	3.2	B
	SB-TL	0.15	19.2	11.5	B	0.12	18.5	10.2	B	0.17	19.7	12.2	B	0.14	18.7	11.0	B
	SB-R	0.18	6.4	8.2	A	0.08	7.6	5.5	A	0.20	6.3	8.6	A	0.09	7.4	5.9	A
	Overall	0.26	9.9	-	A	0.21	8.3	-	A	0.27	9.7	-	A	0.24	8.4	-	A
Elgin St E / D'Arcy St	EB-LT	0.29	9.7	25.7	A	0.49	12.2	27.1	B	0.32	10.4	23.0	B	0.56	14.2	35.4	B
	EB-R	0.20	7.9	21.4	A	0.19	7.6	15.2	A	0.23	8.3	21.9	A	0.22	8.0	17.8	A
	WB-LTR	0.38	11.4	24.7	B	0.33	10.8	24.8	B	0.43	12.4	24.9	B	0.38	11.6	24.9	B
	NB-LTR	0.30	11.2	20.1	B	0.30	11.1	20.5	B	0.34	11.9	21.4	B	0.34	11.9	18.3	B
	SB-LTR	0.06	8.7	11.3	A	0.03	8.9	9.2	A	0.07	9.0	10.9	A	0.03	9.2	10.0	A
Elgin St E / Brook Rd N	EB-TR	0.10	0.0	0.0	A	0.16	0.0	0.0	A	0.11	0.0	0.0	A	0.18	0.0	0.0	A
	WB-TL	0.02	1.7	0.4	A	0.02	1.9	0.4	A	0.02	1.7	0.4	A	0.02	1.9	0.5	A
	NB-LR	0.17	11.0	4.7	B	0.25	12.3	7.3	B	0.20	11.4	5.6	B	0.28	13.1	8.8	B

Table 3: *Total Volumes Intersection Capacity Results.*

As noted in the above table, traffic operations for the subject intersections show basically not change with or without the new trips generated by the proposed development. With the new trips, minor changes in control delay over the years are noted but they are negligible to impact regular traffic operations. The same level of service "A" or "B" is maintained over the years regardless the added trips generated by the proposed development.

7. Auxiliary Lanes Warrants Review

The need for auxiliary lanes (right turn taper and left turn lane) was reviewed for Elgin St. E. at the proposed site accesses. However, volumes at entrances are very low that doesn't reach any threshold for the need of auxiliary lanes according the TAC Manual.

8. Sight Lines at Entrances

Sight distance was reviewed based on the design speed of the roadway. When the road vertical or horizontal curve do not constrain the design speed, as general practice has been assumed the following design speed:

- For low posted speeds of 60 km/h or less, increase by 10 km/h.
- For high posted speeds of 70 km/h or greater, increase by 20 km/h.

As indicated earlier in this report, the posted speed of Elgin St. E. within the study area is 50 km/h; therefore, the design speed of 60 km/h is adopted for this analysis. The minimum sight lines for a design speed of 60 km/h is 130 m.

Elgin St. E. within the site location is basically flat with no dramatic changes on the horizontal and vertical alignments. Based on the height of a driver eye at 1.1 m and the top of the approaching vehicle at 1.3 m above the pavement, sight lines exceed substantially the 130 m.

Sight lines were also reviewed from the CAD file to check potential visibility obstruction from main buildings. As described in the TAC Manual, the eye of a driver should be measure 3.0 m from the edge of the traveled way and be able to have good visibility for at least 130 m. The review found no obstructions in the visibility from building set-backs; it is important however to avoid visibility obstructions on the front yard by carefully planning the placement of shrubs, trees, mail boxes or any other street furniture.

9. On-Site Parking Demand Review

a. Parking Space Requirements under the Zoning By-Law

The current Town's Zoning by-law #85-2003, under the "Parking and Loading Provisions" shows the parking space rates for the different residential building facilities. The subject site falls into the Townhouse or Multiple Unit Dwelling type of use which requires 1.5 parking spaces per dwelling unit. The parking rates under the zoning by-law are general requirements within the Town limits as a mean to standardize the parking spaces. However, specific conditions or characteristics of a residential facility might provide a different outcome for the number of parking spaces requirement. Based on the noted requirement, a minimum of 60 parking spaces are required for a total of 40 dwelling units.

b. Parking Demand Based on the ITE Parking Rates

The "Parking Generation – 4th Edition" published by the Institute of Transportation Engineers (ITE) was reviewed for the type of intended development. As identified in the ITE report, Low/Mid-rise buildings are rental dwelling units. The targeted market is normally low-income families in need of affordable housing; therefore, it is expected that family owned cars are below the population average ratio.

According to the ITE Parking Generation Rates publication, the proposed development (Low/Mid-Rise Buildings) have a peak period parking demand overnight. Based on 40 study sites with an average of 70 dwelling units per site, a parking rate of 1.20 vehicles per dwelling unit was identified for urban conditions.

Based on the ITE parking rate, a minimum of 48 parking spaces are required to satisfy the parking demand for the 40 dwelling units.

c. Parking Demand Based on Survey

Video based parking survey was performed on Monday September 15, 2020 from 5:15 pm to 8:00 am of the following day. The selected site contains three residential buildings with a total of 24 dwelling units that share a single on-site parking area. The site is located just behind the subject site.

Figure 16: *Surveyed Site for Parking Demand.*

For the surveyed period, it was identified the initial number of parked cars on the site, parking occupancy was recorded (ins and outs) for every 15-minute period. It was identified that for the surveyed period, the maximum parking occupancy is 21 vehicles (see enclosed survey sheet).

Based on the maximum occupancy and the number of existing dwelling units, it was identified a parking rate of 0.88 per dwelling unit. This parking rate is representative of this specific site only.

Using the parking rate obtained from the survey, a total of 40 dwelling units would require as minimum 35 parking spaces.

The lower parking rate reflects the existing urban environment which offer different facilities like nearby schools, medical offices, commercial areas and the community centre, all of them within walking distance of the surveyed site.

10. Conclusions

Since the number of dwelling units for the proposed site falls within the ITE range of surveyed parking sites, and since sample (number of study sites, 40 sites) for parking demand provides better statistical outcome, it would be more appropriate to use the ITE rate (1.20 parking space per dwelling unit); therefore, the minimum recommended parking spaces for the total of 40 dwelling units is estimated to 48 spaces.

Based on the TAC Manual and our sight lines review, it has been identified no issues at proposed entrances. The need for auxiliary lanes or tapers has been also reviewed and found no need for them due to the very low of turning movements.

Due to the very limited scale of the proposed development, the additional trips will impose virtually no impact on the adjacent streets and intersections; any minor traffic increase as a result of the new trips will be negligible to the current traffic operations.

Should you require any further information in consideration of the above, please contact the undersigned.

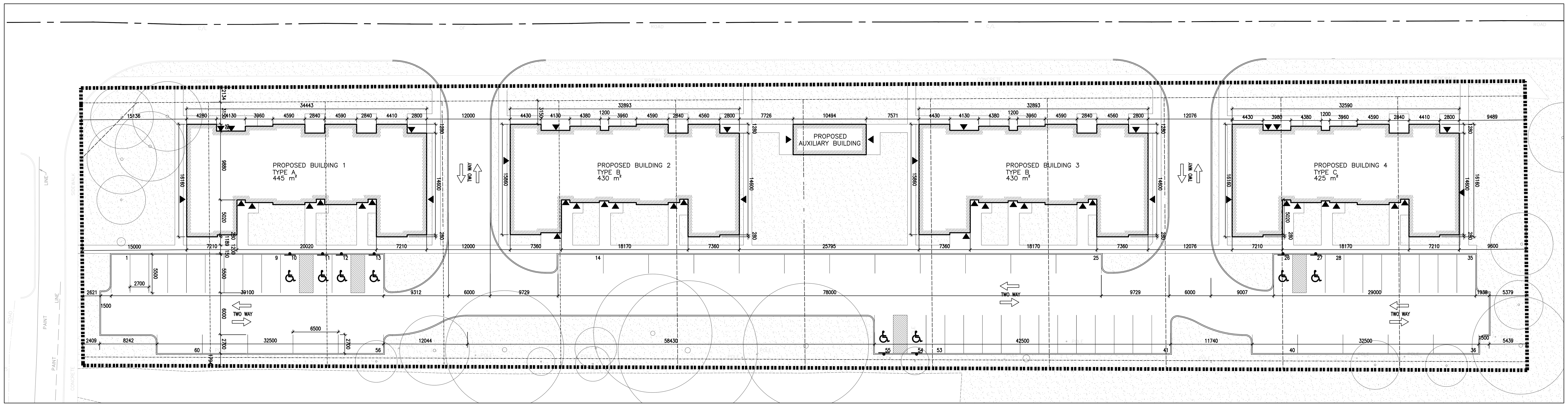
Respectfully submitted;

Martin Asurza, MEng, P.Eng.
Senior Transportation Engineer

Appendix A

Draft Site Plan

2 SP01 KEY PLAN
NTS



1 SP01 SITEPLAN
1:300

DO NOT SCALE THE DRAWINGS.

CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.

DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED AND SEALED BY THE CONSULTANT.

NO.	ISSUES	DATE	BY
1	ISSUED FOR REZONING	JUNE. 30 2020	BBA

NO.	REVISIONS	DATE	BY

PROJECT:

Elgin Park Redevelopment Project

287-327 Elgin Street East
Coburg, Ontario

Town of Coburg

DRAWING:

SITE PLAN

BARRY BRYAN ASSOCIATES
Architects
Engineers
Project Managers
250 Water Street
Suite 201
Whitby, Ontario
L1N 0G5
Tel: (905) 666-5252
Fax: (905) 666-5256
e-mail: bba@bba-archeng.com

DESIGN BY: NS	DOC. CONTROL: DATE:
DRAWN BY: HS	% COMPLETE:
CHECKED BY:	INITIAL:
DATE: JUNE 2020	
SCALE: AS NOTED	
FILE:	

PROJECT NO: **19284**

DRAWING NO: **SP01**

Appendix B

Traffic Data, Field Counts & Projections

Basic Volume Report: 212002 EB

Station ID : 212002 EB

Info Line 1 : CR 20, 0.6 km East of
Info Line 2 : Division St

GPS Lat/Lon :

DB File : DBFILE 050618 - 137.DB

Last Connected Device Type : Unicorn
Version Number : 4.31
Serial Number : 24131

Number of Lanes : 2
Posted Speed Limit : 50.0 kph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.	E	EB 1 LANE	Normal	Veh.	No	

Lane #1 Basic Volume Data From: 00:00 - 04/28/2018 To: 23:59 - 05/04/2018

Date	Time	:00	:15	:30	:45	Total
04/28/18	00:00	9	3	5	9	26
Sat	01:00	3	4	5	3	15
	02:00	4	1	1	1	7
	03:00	1	2	1	1	5
	04:00	2	0	5	1	8
	05:00	3	0	3	1	7
	06:00	6	8	9	10	33
	07:00	6	14	16	20	56
	08:00	19	16	20	33	88
	09:00	27	32	39	43	141
	10:00	41	39	26	44	150
	11:00	44	38	53	45	180
	12:00	49	44	41	46	180
	13:00	49	55	44	45	193
	14:00	61	49	50	40	200
	15:00	50	48	49	53	200
	16:00	49	39	42	37	167
	17:00	45	41	45	34	165
	18:00	52	49	36	26	163
	19:00	29	32	26	20	107
	20:00	34	16	17	27	94
	21:00	24	16	16	26	82
	22:00	14	12	15	10	51
	23:00	15	14	8	7	44
Day Total :						2362

AM Total :	716 (30.3%)	Peak AM Hour : 11:00 =	180 (7.6%)	Peak AM Factor : 0.849	Average Period :	24.6
PM Total :	1646 (69.7%)	Peak PM Hour : 13:15 =	205 (8.7%)	Peak PM Factor : 0.840	Average Hour :	98.4

Date	Time	:00	:15	:30	:45	Total
04/29/18	00:00	4	6	13	4	27
Sun	01:00	2	2	9	8	21
	02:00	4	4	1	5	14
	03:00	2	3	1	0	6
	04:00	0	1	0	1	2
	05:00	2	2	3	2	9
	06:00	8	8	5	2	23
	07:00	4	9	15	16	44
	08:00	13	13	14	18	58
	09:00	21	14	37	43	115
	10:00	40	25	34	34	133
	11:00	36	38	46	26	146
	12:00	30	63	50	54	197
	13:00	55	44	52	47	198
	14:00	50	46	53	53	202
	15:00	48	53	41	43	185
	16:00	43	44	45	41	173
	17:00	53	41	25	28	147
	18:00	28	45	33	23	129
	19:00	30	29	28	25	112
	20:00	24	25	18	17	84
	21:00	26	16	19	14	75
	22:00	9	11	7	4	31
	23:00	9	15	2	6	32
Day Total :						2163

AM Total :	598 (27.6%)	Peak AM Hour :	10:45 =	154 (7.1%)	Peak AM Factor : 0.837	Average Period :	22.5
PM Total :	1565 (72.4%)	Peak PM Hour :	12:15 =	222 (10.3%)	Peak PM Factor : 0.881	Average Hour :	90.1

Date	Time	:00	:15	:30	:45	Total
04/30/18	00:00	5	3	4	4	16
Mon	01:00	1	3	0	3	7
	02:00	3	1	1	1	6
	03:00	2	2	3	0	7
	04:00	1	0	1	5	7
	05:00	0	9	8	15	32
	06:00	20	25	44	39	128
	07:00	27	33	35	45	140
	08:00	47	54	43	46	190
	09:00	22	41	36	44	143
	10:00	33	39	38	43	153
	11:00	41	47	36	47	171
	12:00	57	52	53	59	221
	13:00	49	53	51	46	199
	14:00	58	60	71	53	242
	15:00	49	66	65	58	238
	16:00	75	57	67	58	257
	17:00	65	64	64	49	242
	18:00	57	47	54	44	202
	19:00	49	35	31	32	147
	20:00	27	27	29	36	119
	21:00	30	28	14	14	86
	22:00	15	8	12	6	41
	23:00	11	12	7	3	33
Day Total :						3027

AM Total :	1000 (33.0%)	Peak AM Hour : 08:00 =	190 (6.3%)	Peak AM Factor : 0.880	Average Period : 31.5
PM Total :	2027 (67.0%)	Peak PM Hour : 15:15 =	264 (8.7%)	Peak PM Factor : 0.880	Average Hour : 126.1

Date	Time	:00	:15	:30	:45	Total
05/01/18	00:00	3	5	0	4	12
Tue	01:00	2	1	0	1	4
	02:00	0	1	0	0	1
	03:00	1	3	2	0	6
	04:00	2	1	1	4	8
	05:00	2	6	8	11	27
	06:00	14	33	29	51	127
	07:00	22	36	44	48	150
	08:00	58	52	42	41	193
	09:00	26	43	39	50	158
	10:00	35	42	56	38	171
	11:00	42	44	40	41	167
	12:00	48	50	69	49	216
	13:00	56	47	41	40	184
	14:00	71	57	65	76	269
	15:00	59	59	59	60	237
	16:00	52	71	58	73	254
	17:00	68	57	66	60	251
	18:00	69	65	52	54	240
	19:00	32	50	32	31	145
	20:00	33	29	31	28	121
	21:00	35	26	24	17	102
	22:00	25	17	18	11	71
	23:00	26	13	9	8	56
Day Total :						3170

AM Total :	1024 (32.3%)	Peak AM Hour : 07:30 =	202 (6.4%)	Peak AM Factor : 0.871	Average Period : 33.0
PM Total :	2146 (67.7%)	Peak PM Hour : 16:15 =	270 (8.5%)	Peak PM Factor : 0.888	Average Hour : 132.1

Date	Time	:00	:15	:30	:45	Total
05/02/18	00:00	4	6	4	3	17
Wed	01:00	6	2	3	1	12
	02:00	1	1	2	4	8
	03:00	0	1	2	2	5
	04:00	1	3	3	1	8
	05:00	4	5	9	12	30
	06:00	13	26	39	41	119
	07:00	20	31	26	40	117
	08:00	63	57	35	57	212
	09:00	42	53	51	57	203
	10:00	34	43	38	54	169
	11:00	62	56	36	52	206
	12:00	52	54	47	58	211
	13:00	50	46	44	44	184
	14:00	63	73	61	58	255
	15:00	55	55	54	65	229
	16:00	79	64	76	56	275
	17:00	68	64	50	53	235
	18:00	52	47	45	49	193
	19:00	33	32	33	42	140
	20:00	36	50	33	42	161
	21:00	32	24	25	10	91
	22:00	15	17	16	10	58
	23:00	16	15	12	8	51
Day Total :						3189

AM Total :	1106 (34.7%)	Peak AM Hour : 08:00 =	212 (6.6%)	Peak AM Factor : 0.841	Average Period : 33.2
PM Total :	2083 (65.3%)	Peak PM Hour : 15:45 =	284 (8.9%)	Peak PM Factor : 0.899	Average Hour : 132.9

Date	Time	:00	:15	:30	:45	Total
05/03/18	00:00	2	1	5	2	10
Thu	01:00	5	1	3	1	10
	02:00	1	2	3	1	7
	03:00	3	4	1	3	11
	04:00	6	1	2	1	10
	05:00	3	6	10	13	32
	06:00	18	28	39	33	118
	07:00	21	31	30	54	136
	08:00	39	60	31	54	184
	09:00	30	47	32	46	155
	10:00	46	45	36	30	157
	11:00	42	52	48	52	194
	12:00	45	42	47	68	202
	13:00	43	57	45	54	199
	14:00	61	57	56	55	229
	15:00	63	66	72	62	263
	16:00	65	75	59	65	264
	17:00	76	69	61	43	249
	18:00	53	46	47	43	189
	19:00	45	33	32	32	142
	20:00	34	28	31	33	126
	21:00	25	25	19	17	86
	22:00	16	21	14	10	61
	23:00	12	8	15	2	37
Day Total :						3071

AM Total :	1024 (33.3%)	Peak AM Hour : 11:00 =	194 (6.3%)	Peak AM Factor : 0.808	Average Period : 32.0
PM Total :	2047 (66.7%)	Peak PM Hour : 16:15 =	275 (9.0%)	Peak PM Factor : 0.905	Average Hour : 128.0

Date	Time	:00	:15	:30	:45	Total
05/04/18	00:00	3	5	4	2	14
Fri	01:00	1	4	2	2	9
	02:00	0	3	0	1	4
	03:00	0	2	0	3	5
	04:00	1	1	1	2	5
	05:00	1	5	10	11	27
	06:00	16	24	35	45	120
	07:00	21	30	31	37	119
	08:00	38	45	35	39	157
	09:00	31	42	35	43	151
	10:00	42	28	37	51	158
	11:00	25	35	32	51	143
	12:00	47	57	65	61	230
	13:00	61	57	53	47	218
	14:00	51	66	55	55	227
	15:00	69	47	67	57	240
	16:00	75	70	71	49	265
	17:00	54	67	58	42	221
	18:00	60	52	50	45	207
	19:00	39	45	39	35	158
	20:00	35	31	38	28	132
	21:00	28	32	23	20	103
	22:00	15	16	12	15	58
	23:00	12	9	5	10	36
Day Total :						3007

AM Total :	912 (30.3%)	Peak AM Hour : 09:15 =	162 (5.4%)	Peak AM Factor : 0.794	Average Period : 31.3
PM Total :	2095 (69.7%)	Peak PM Hour : 15:45 =	273 (9.1%)	Peak PM Factor : 0.910	Average Hour : 125.3

Lane #2 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
2.	E	EB 2 LANE	Normal	Veh.	No	

Lane #2 Basic Volume Data From: 00:00 - 04/28/2018 To: 23:59 - 05/04/2018

Date	Time	:00	:15	:30	:45	Total
04/28/18	00:00	3	6	7	2	18
Sat	01:00	3	2	4	5	14
	02:00	3	6	0	1	10
	03:00	3	0	0	1	4
	04:00	0	0	1	0	1
	05:00	1	2	1	8	12
	06:00	6	10	18	21	55
	07:00	15	8	13	20	56
	08:00	12	14	22	34	82
	09:00	34	38	40	48	160
	10:00	46	44	42	40	172
	11:00	43	46	50	55	194
	12:00	60	56	43	38	197
	13:00	58	47	42	37	184
	14:00	44	52	38	38	172
	15:00	44	40	44	60	188
	16:00	27	30	43	37	137
	17:00	27	22	27	30	106
	18:00	27	43	39	26	135
	19:00	15	22	16	14	67
	20:00	12	7	11	20	50
	21:00	12	9	11	10	42
	22:00	9	6	6	6	27
	23:00	8	3	3	2	16
Day Total :						2099

AM Total :	778 (37.1%)	Peak AM Hour : 11:00 =	194 (9.2%)	Peak AM Factor : 0.882	Average Period :	21.9
PM Total :	1321 (62.9%)	Peak PM Hour : 12:00 =	197 (9.4%)	Peak PM Factor : 0.821	Average Hour :	87.5

Date	Time	:00	:15	:30	:45	Total
04/29/18	00:00	4	1	5	8	18
Sun	01:00	7	4	4	3	18
	02:00	2	2	1	2	7
	03:00	0	0	1	1	2
	04:00	0	1	0	0	1
	05:00	1	2	1	7	11
	06:00	9	11	18	16	54
	07:00	3	7	17	22	49
	08:00	15	21	19	15	70
	09:00	15	25	28	42	110
	10:00	34	27	36	29	126
	11:00	40	24	40	30	134
	12:00	28	41	24	41	134
	13:00	38	44	54	58	194
	14:00	52	36	35	57	180
	15:00	47	51	35	46	179
	16:00	44	39	35	33	151
	17:00	33	42	24	27	126
	18:00	31	24	24	25	104
	19:00	23	13	20	13	69
	20:00	13	15	13	15	56
	21:00	7	14	7	9	37
	22:00	6	9	11	6	32
	23:00	6	11	4	5	26
Day Total :						1888

AM Total :	600 (31.8%)	Peak AM Hour : 09:45 =	139 (7.4%)	Peak AM Factor : 0.827	Average Period : 19.7
PM Total :	1288 (68.2%)	Peak PM Hour : 13:15 =	208 (11.0%)	Peak PM Factor : 0.897	Average Hour : 78.7

Date	Time	:00	:15	:30	:45	Total
04/30/18	00:00	4	4	1	3	12
Mon	01:00	4	5	2	5	16
	02:00	2	1	0	3	6
	03:00	2	3	3	2	10
	04:00	1	1	3	4	9
	05:00	6	5	6	21	38
	06:00	24	50	67	84	225
	07:00	31	46	38	82	197
	08:00	70	74	61	73	278
	09:00	48	47	44	59	198
	10:00	46	38	38	56	178
	11:00	56	39	58	46	199
	12:00	52	54	46	56	208
	13:00	55	46	39	44	184
	14:00	56	71	67	54	248
	15:00	54	52	52	50	208
	16:00	55	59	55	45	214
	17:00	42	43	49	48	182
	18:00	44	44	59	47	194
	19:00	29	23	25	25	102
	20:00	25	18	14	20	77
	21:00	20	24	10	4	58
	22:00	7	12	14	6	39
	23:00	6	7	3	3	19
Day Total :						3099

AM Total :	1366 (44.1%)	Peak AM Hour : 07:45 =	287 (9.3%)	Peak AM Factor : 0.854	Average Period : 32.3
PM Total :	1733 (55.9%)	Peak PM Hour : 14:00 =	248 (8.0%)	Peak PM Factor : 0.873	Average Hour : 129.1

Date	Time	:00	:15	:30	:45	Total
05/01/18	00:00	4	2	1	5	12
Tue	01:00	5	2	4	1	12
	02:00	2	1	1	2	6
	03:00	0	2	3	1	6
	04:00	2	0	5	4	11
	05:00	6	4	14	21	45
	06:00	28	53	61	89	231
	07:00	36	40	61	70	207
	08:00	93	87	53	59	292
	09:00	60	52	43	54	209
	10:00	52	47	40	48	187
	11:00	43	40	37	43	163
	12:00	56	48	52	62	218
	13:00	53	53	53	51	210
	14:00	55	60	72	57	244
	15:00	61	49	52	65	227
	16:00	63	60	52	54	229
	17:00	45	47	47	48	187
	18:00	39	38	35	47	159
	19:00	34	38	23	41	136
	20:00	21	20	16	14	71
	21:00	8	9	14	5	36
	22:00	14	8	20	6	48
	23:00	13	10	4	4	31
Day Total :						3177

AM Total :	1381 (43.5%)	Peak AM Hour : 07:30 =	311 (9.8%)	Peak AM Factor : 0.836	Average Period : 33.1
PM Total :	1796 (56.5%)	Peak PM Hour : 14:15 =	250 (7.9%)	Peak PM Factor : 0.868	Average Hour : 132.4

Date	Time	:00	:15	:30	:45	Total
05/02/18	00:00	3	4	1	5	13
Wed	01:00	2	8	4	1	15
	02:00	1	1	3	1	6
	03:00	1	0	2	1	4
	04:00	0	2	1	3	6
	05:00	4	6	7	20	37
	06:00	20	48	66	83	217
	07:00	33	54	45	71	203
	08:00	91	69	59	60	279
	09:00	61	86	64	51	262
	10:00	40	54	40	51	185
	11:00	47	56	45	55	203
	12:00	47	41	50	56	194
	13:00	54	51	64	57	226
	14:00	56	57	64	51	228
	15:00	54	51	47	42	194
	16:00	61	63	56	64	244
	17:00	62	57	51	64	234
	18:00	48	43	53	39	183
	19:00	37	24	24	22	107
	20:00	32	19	26	19	96
	21:00	16	11	11	7	45
	22:00	7	6	17	7	37
	23:00	8	9	1	6	24
Day Total :						3242

AM Total :	1430 (44.1%)	Peak AM Hour : 07:45 =	290 (8.9%)	Peak AM Factor : 0.797	Average Period : 33.8
PM Total :	1812 (55.9%)	Peak PM Hour : 16:15 =	245 (7.6%)	Peak PM Factor : 0.957	Average Hour : 135.1

Date	Time	:00	:15	:30	:45	Total
05/03/18	00:00	2	5	3	5	15
Thu	01:00	1	6	1	3	11
	02:00	0	1	2	1	4
	03:00	1	1	2	0	4
	04:00	2	1	4	2	9
	05:00	5	8	8	20	41
	06:00	25	42	66	87	220
	07:00	30	54	49	70	203
	08:00	96	77	57	64	294
	09:00	60	58	47	52	217
	10:00	50	46	47	39	182
	11:00	38	55	53	50	196
	12:00	47	65	62	54	228
	13:00	45	68	52	52	217
	14:00	67	79	67	60	273
	15:00	60	55	46	67	228
	16:00	61	50	54	50	215
	17:00	53	52	60	47	212
	18:00	45	53	50	59	207
	19:00	29	32	28	32	121
	20:00	23	22	12	20	77
	21:00	10	15	10	11	46
	22:00	12	9	14	4	39
	23:00	6	6	7	8	27
Day Total :						3286

AM Total :	1396 (42.5%)	Peak AM Hour : 07:45 =	300 (9.1%)	Peak AM Factor : 0.781	Average Period : 34.2
PM Total :	1890 (57.5%)	Peak PM Hour : 14:00 =	273 (8.3%)	Peak PM Factor : 0.864	Average Hour : 136.9

Date	Time	:00	:15	:30	:45	Total
05/04/18	00:00	4	7	4	1	16
Fri	01:00	3	1	1	1	6
	02:00	1	2	1	1	5
	03:00	1	0	5	0	6
	04:00	1	1	2	3	7
	05:00	3	5	9	22	39
	06:00	15	39	60	88	202
	07:00	34	34	55	61	184
	08:00	65	63	61	66	255
	09:00	62	62	58	51	233
	10:00	51	48	63	62	224
	11:00	36	41	32	49	158
	12:00	54	49	52	61	216
	13:00	63	62	47	46	218
	14:00	51	63	64	51	229
	15:00	65	57	46	48	216
	16:00	54	45	45	50	194
	17:00	43	33	30	42	148
	18:00	52	48	75	58	233
	19:00	43	30	31	15	119
	20:00	28	31	31	53	143
	21:00	38	24	20	4	86
	22:00	8	11	8	4	31
	23:00	4	3	8	6	21
Day Total :						3189

AM Total :	1335 (41.9%)	Peak AM Hour : 08:00 =	255 (8.0%)	Peak AM Factor : 0.724	Average Period : 33.2
PM Total :	1854 (58.1%)	Peak PM Hour : 14:15 =	243 (7.6%)	Peak PM Factor : 0.810	Average Hour : 132.9

Basic Volume Summary: 212002 EB

Grand Total For Data From: 00:00 - 04/28/2018 To: 23:59 - 05/04/2018

Lane	Total Count		# Of Days	ADT	Avg. Period	Avg. Hour	AM Total & Percent	PM Total & Percent
#1.	19989	(50.0%)	7.00	2856	29.7	119.0	6380 (31.9%)	13609 (68.1%)
#2.	19980	(50.0%)	7.00	2854	29.7	118.9	8286 (41.5%)	11694 (58.5%)
ALL	39969		7.00	5710	59.4	237.9	14666 (36.7%)	25303 (63.3%)

Lane	Peak AM Hour		Date	Peak AM Factor	Peak PM Hour		Date	Peak PM Factor
#1.	08:00 =	212	05/02/2018	0.841	15:45 =	284	05/02/2018	0.899
#2.	07:30 =	311	05/01/2018	0.836	14:00 =	273	05/03/2018	0.864

Basic Volume Report: 212002 WB

Station ID : 212002 WB
Info Line 1 : CR 20, 0.6 km East of
Info Line 2 : Division St
GPS Lat/Lon :
DB File : DBFILE 050618 - 138.DB

Last Connected Device Type : Unicorn
Version Number : 4.31
Serial Number : 24130

Number of Lanes : 2
Posted Speed Limit : 50.0 kph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.	W	WB 1 LANE	Normal	Veh.	No	

Lane #1 Basic Volume Data From: 00:00 - 04/28/2018 To: 23:59 - 05/04/2018

Date	Time	:00	:15	:30	:45	Total
04/28/18	00:00	6	5	5	4	20
Sat	01:00	3	4	5	1	13
	02:00	1	1	1	1	4
	03:00	1	0	0	1	2
	04:00	0	1	1	0	2
	05:00	3	2	7	3	15
	06:00	2	6	4	8	20
	07:00	21	11	17	12	61
	08:00	19	14	22	28	83
	09:00	32	23	38	45	138
	10:00	26	33	31	36	126
	11:00	53	47	35	49	184
	12:00	44	36	27	37	144
	13:00	44	55	43	49	191
	14:00	46	43	38	52	179
	15:00	40	29	44	52	165
	16:00	30	30	31	22	113
	17:00	52	44	31	28	155
	18:00	31	24	38	27	120
	19:00	18	13	17	8	56
	20:00	20	10	10	16	56
	21:00	8	13	8	8	37
	22:00	10	6	8	8	32
	23:00	5	4	7	8	24
Day Total :						1940

AM Total :	668 (34.4%)	Peak AM Hour : 11:00 =	184 (9.5%)	Peak AM Factor : 0.868	Average Period : 20.2
PM Total :	1272 (65.6%)	Peak PM Hour : 13:15 =	193 (9.9%)	Peak PM Factor : 0.877	Average Hour : 80.8

Date	Time	:00	:15	:30	:45	Total
04/29/18	00:00	5	3	4	0	12
Sun	01:00	1	0	3	1	5
	02:00	1	4	0	2	7
	03:00	1	0	2	1	4
	04:00	0	1	2	1	4
	05:00	1	0	4	2	7
	06:00	3	5	6	4	18
	07:00	6	5	6	9	26
	08:00	11	16	19	25	71
	09:00	30	20	27	30	107
	10:00	39	35	33	42	149
	11:00	47	41	32	35	155
	12:00	35	35	30	39	139
	13:00	36	40	39	37	152
	14:00	36	49	33	33	151
	15:00	38	29	32	47	146
	16:00	53	56	21	17	147
	17:00	29	31	17	45	122
	18:00	40	35	33	19	127
	19:00	26	20	12	32	90
	20:00	10	4	9	17	40
	21:00	10	10	9	6	35
	22:00	5	4	5	3	17
	23:00	2	3	3	0	8
Day Total :						1739

AM Total :	565 (32.5%)	Peak AM Hour : 10:30 =	163 (9.4%)	Peak AM Factor : 0.867	Average Period : 18.1
PM Total :	1174 (67.5%)	Peak PM Hour : 15:30 =	188 (10.8%)	Peak PM Factor : 0.839	Average Hour : 72.5

Date	Time	:00	:15	:30	:45	Total
04/30/18	00:00	0	1	4	1	6
Mon	01:00	1	0	0	2	3
	02:00	1	1	1	1	4
	03:00	3	1	0	3	7
	04:00	0	1	2	5	8
	05:00	4	4	10	7	25
	06:00	15	13	19	33	80
	07:00	29	22	43	27	121
	08:00	40	44	43	42	169
	09:00	49	38	38	56	181
	10:00	40	39	28	39	146
	11:00	47	34	41	37	159
	12:00	38	47	38	43	166
	13:00	39	37	38	29	143
	14:00	55	25	30	52	162
	15:00	60	34	64	42	200
	16:00	49	49	38	58	194
	17:00	56	34	35	35	160
	18:00	31	35	25	32	123
	19:00	30	19	23	24	96
	20:00	20	20	17	16	73
	21:00	9	9	2	24	44
	22:00	2	5	4	5	16
	23:00	7	5	2	2	16
Day Total :						2302

AM Total :	909 (39.5%)	Peak AM Hour :	09:00 =	181 (7.9%)	Peak AM Factor : 0.808	Average Period :	24.0
PM Total :	1393 (60.5%)	Peak PM Hour :	14:45 =	210 (9.1%)	Peak PM Factor : 0.820	Average Hour :	95.9

Date	Time	:00	:15	:30	:45	Total
05/01/18	00:00	5	3	1	0	9
Tue	01:00	1	0	0	3	4
	02:00	0	0	2	1	3
	03:00	1	2	3	1	7
	04:00	0	2	0	2	4
	05:00	1	2	10	8	21
	06:00	10	17	25	28	80
	07:00	36	27	30	43	136
	08:00	32	42	37	36	147
	09:00	49	42	41	54	186
	10:00	38	44	35	40	157
	11:00	41	43	36	43	163
	12:00	49	34	33	53	169
	13:00	36	23	34	35	128
	14:00	53	36	36	49	174
	15:00	62	49	56	44	211
	16:00	51	37	39	43	170
	17:00	55	38	28	37	158
	18:00	47	35	30	23	135
	19:00	37	30	25	25	117
	20:00	20	16	16	21	73
	21:00	11	15	9	7	42
	22:00	18	8	5	8	39
	23:00	12	2	4	2	20
Day Total :						2353

AM Total :	917 (39.0%)	Peak AM Hour : 09:00 =	186 (7.9%)	Peak AM Factor : 0.861	Average Period : 24.5
PM Total :	1436 (61.0%)	Peak PM Hour : 14:45 =	216 (9.2%)	Peak PM Factor : 0.871	Average Hour : 98.0

Date	Time	:00	:15	:30	:45	Total
05/02/18	00:00	6	1	2	1	10
Wed	01:00	2	0	0	2	4
	02:00	0	3	1	0	4
	03:00	0	1	0	2	3
	04:00	0	2	4	3	9
	05:00	4	2	16	14	36
	06:00	17	14	29	28	88
	07:00	40	32	34	37	143
	08:00	43	63	46	52	204
	09:00	54	58	48	43	203
	10:00	42	33	51	50	176
	11:00	49	37	41	64	191
	12:00	38	52	47	35	172
	13:00	68	46	36	31	181
	14:00	40	40	46	39	165
	15:00	64	30	53	51	198
	16:00	51	41	38	43	173
	17:00	41	42	46	38	167
	18:00	39	40	35	36	150
	19:00	47	39	25	32	143
	20:00	17	14	20	16	67
	21:00	27	21	11	6	65
	22:00	4	3	7	3	17
	23:00	12	1	2	2	17
Day Total :						2586

AM Total :	1071 (41.4%)	Peak AM Hour : 08:15 =	215 (8.3%)	Peak AM Factor : 0.840	Average Period : 26.9
PM Total :	1515 (58.6%)	Peak PM Hour : 12:15 =	202 (7.8%)	Peak PM Factor : 0.743	Average Hour : 107.8

Date	Time	:00	:15	:30	:45	Total
05/03/18	00:00	9	1	2	0	12
Thu	01:00	1	2	1	0	4
	02:00	0	0	1	1	2
	03:00	1	1	0	1	3
	04:00	2	2	3	2	9
	05:00	5	1	12	6	24
	06:00	17	17	23	33	90
	07:00	36	25	36	30	127
	08:00	34	49	47	47	177
	09:00	50	57	43	43	193
	10:00	34	36	41	44	155
	11:00	36	56	46	34	172
	12:00	35	45	52	40	172
	13:00	46	34	42	39	161
	14:00	55	41	39	51	186
	15:00	53	31	50	49	183
	16:00	61	47	59	50	217
	17:00	37	27	40	36	140
	18:00	44	32	36	26	138
	19:00	39	18	19	16	92
	20:00	27	18	12	31	88
	21:00	26	18	16	4	64
	22:00	2	5	10	5	22
	23:00	9	8	4	4	25
Day Total :						2456

AM Total :	968 (39.4%)	Peak AM Hour : 08:30 =	201 (8.2%)	Peak AM Factor : 0.882	Average Period : 25.6
PM Total :	1488 (60.6%)	Peak PM Hour : 16:00 =	217 (8.8%)	Peak PM Factor : 0.889	Average Hour : 102.3

Date	Time	:00	:15	:30	:45	Total
05/04/18	00:00	4	1	2	2	9
Fri	01:00	1	2	2	1	6
	02:00	0	0	0	0	0
	03:00	0	0	1	1	2
	04:00	0	0	2	2	4
	05:00	5	5	9	8	27
	06:00	6	7	27	30	70
	07:00	20	32	32	45	129
	08:00	31	42	33	45	151
	09:00	47	40	42	51	180
	10:00	40	36	46	54	176
	11:00	40	54	43	37	174
	12:00	54	43	43	31	171
	13:00	39	42	43	43	167
	14:00	41	49	49	56	195
	15:00	58	38	46	35	177
	16:00	56	60	55	35	206
	17:00	46	42	32	32	152
	18:00	42	32	58	35	167
	19:00	36	31	25	19	111
	20:00	20	14	15	21	70
	21:00	30	29	16	6	81
	22:00	22	6	4	5	37
	23:00	7	4	3	9	23
Day Total :						2485

AM Total :	928 (37.3%)	Peak AM Hour :	10:30 =	194 (7.8%)	Peak AM Factor :	0.898	Average Period : 25.9
PM Total :	1557 (62.7%)	Peak PM Hour :	14:15 =	212 (8.5%)	Peak PM Factor :	0.883	Average Hour : 103.5

Lane #2 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
2.	W	WB 2 LANE	Normal	Veh.	No	

Lane #2 Basic Volume Data From: 00:00 - 04/28/2018 To: 23:59 - 05/04/2018

Date	Time	:00	:15	:30	:45	Total
04/28/18	00:00	9	3	3	2	17
Sat	01:00	2	3	2	0	7
	02:00	1	5	5	2	13
	03:00	3	1	1	1	6
	04:00	2	4	3	1	10
	05:00	4	9	10	6	29
	06:00	10	8	9	10	37
	07:00	27	22	14	31	94
	08:00	31	27	33	28	119
	09:00	38	37	50	60	185
	10:00	39	47	36	45	167
	11:00	49	63	58	62	232
	12:00	50	49	49	41	189
	13:00	59	58	37	32	186
	14:00	54	62	45	33	194
	15:00	42	39	57	54	192
	16:00	43	30	39	34	146
	17:00	84	43	29	28	184
	18:00	28	24	56	35	143
	19:00	28	15	21	12	76
	20:00	23	14	9	18	64
	21:00	11	13	15	17	56
	22:00	17	10	11	13	51
	23:00	11	5	4	9	29
Day Total :						2426

AM Total :	916 (37.8%)	Peak AM Hour : 11:00 =	232 (9.6%)	Peak AM Factor : 0.921	Average Period : 25.3
PM Total :	1510 (62.2%)	Peak PM Hour : 12:30 =	207 (8.5%)	Peak PM Factor : 0.616	Average Hour : 101.1

Date	Time	:00	:15	:30	:45	Total
04/29/18	00:00	1	1	2	3	7
Sun	01:00	2	4	2	1	9
	02:00	7	4	2	2	15
	03:00	2	0	1	0	3
	04:00	1	1	1	4	7
	05:00	1	4	10	7	22
	06:00	7	9	10	5	31
	07:00	7	13	14	17	51
	08:00	15	17	23	29	84
	09:00	42	27	31	41	141
	10:00	61	44	41	59	205
	11:00	58	42	44	42	186
	12:00	52	42	40	41	175
	13:00	43	41	48	54	186
	14:00	51	43	45	41	180
	15:00	54	45	42	59	200
	16:00	75	62	44	40	221
	17:00	43	34	27	43	147
	18:00	60	37	30	24	151
	19:00	41	19	30	38	128
	20:00	17	18	6	20	61
	21:00	13	8	8	8	37
	22:00	10	5	3	4	22
	23:00	7	4	3	3	17
Day Total :						2286

AM Total :	761 (33.3%)	Peak AM Hour :	10:00 =	205 (9.0%)	Peak AM Factor : 0.840	Average Period :	23.8
PM Total :	1525 (66.7%)	Peak PM Hour :	15:45 =	240 (10.5%)	Peak PM Factor : 0.800	Average Hour :	95.3

Date	Time	:00	:15	:30	:45	Total
04/30/18	00:00	3	3	0	1	7
Mon	01:00	0	1	3	6	10
	02:00	4	3	1	1	9
	03:00	1	0	5	3	9
	04:00	5	4	6	13	28
	05:00	12	15	23	32	82
	06:00	29	28	26	37	120
	07:00	66	37	42	68	213
	08:00	73	100	69	49	291
	09:00	54	41	58	51	204
	10:00	41	33	59	43	176
	11:00	50	59	61	48	218
	12:00	64	52	43	48	207
	13:00	62	47	41	28	178
	14:00	52	48	60	73	233
	15:00	92	66	60	62	280
	16:00	79	65	65	71	280
	17:00	61	60	51	43	215
	18:00	50	39	49	34	172
	19:00	41	34	43	31	149
	20:00	24	34	25	23	106
	21:00	21	22	7	13	63
	22:00	15	4	5	11	35
	23:00	14	6	6	2	28
Day Total :						3313

AM Total :	1367 (41.3%)	Peak AM Hour : 07:45 =	310 (9.4%)	Peak AM Factor : 0.775	Average Period : 34.5
PM Total :	1946 (58.7%)	Peak PM Hour : 14:30 =	291 (8.8%)	Peak PM Factor : 0.791	Average Hour : 138.0

Date	Time	:00	:15	:30	:45	Total
05/01/18	00:00	7	3	2	3	15
Tue	01:00	2	5	2	2	11
	02:00	0	2	1	2	5
	03:00	3	2	2	4	11
	04:00	2	5	8	10	25
	05:00	16	15	16	24	71
	06:00	16	29	27	34	106
	07:00	59	57	48	64	228
	08:00	95	93	61	84	333
	09:00	51	56	51	56	214
	10:00	59	38	34	52	183
	11:00	58	54	48	51	211
	12:00	60	55	44	47	206
	13:00	51	51	41	37	180
	14:00	66	46	65	75	252
	15:00	85	57	59	67	268
	16:00	75	56	68	58	257
	17:00	68	46	48	50	212
	18:00	47	34	40	42	163
	19:00	53	39	28	27	147
	20:00	29	21	28	19	97
	21:00	19	15	19	16	69
	22:00	23	8	7	6	44
	23:00	22	6	3	4	35
Day Total :						3343

AM Total :	1413 (42.3%)	Peak AM Hour : 08:00 =	333 (10.0%)	Peak AM Factor : 0.876	Average Period : 34.8
PM Total :	1930 (57.7%)	Peak PM Hour : 14:30 =	282 (8.4%)	Peak PM Factor : 0.829	Average Hour : 139.3

Date	Time	:00	:15	:30	:45	Total
05/02/18	00:00	7	2	5	2	16
Wed	01:00	2	3	1	5	11
	02:00	5	2	0	0	7
	03:00	0	2	2	4	8
	04:00	7	4	4	10	25
	05:00	17	9	21	17	64
	06:00	22	33	26	37	118
	07:00	64	55	48	65	232
	08:00	81	98	71	49	299
	09:00	53	58	55	59	225
	10:00	51	54	48	48	201
	11:00	56	34	55	66	211
	12:00	62	54	45	47	208
	13:00	54	56	51	51	212
	14:00	72	55	69	56	252
	15:00	74	59	55	61	249
	16:00	75	52	67	60	254
	17:00	68	58	47	50	223
	18:00	47	36	36	34	153
	19:00	59	39	34	35	167
	20:00	27	21	16	21	85
	21:00	24	28	15	14	81
	22:00	10	2	16	9	37
	23:00	19	5	4	4	32
Day Total :						3370

AM Total :	1417 (42.0%)	Peak AM Hour : 07:45 =	315 (9.3%)	Peak AM Factor : 0.804	Average Period : 35.1
PM Total :	1953 (58.0%)	Peak PM Hour : 14:30 =	258 (7.7%)	Peak PM Factor : 0.860	Average Hour : 140.4

Date	Time	:00	:15	:30	:45	Total
05/03/18	00:00	7	2	4	4	17
Thu	01:00	5	2	1	2	10
	02:00	4	3	1	2	10
	03:00	2	1	2	5	10
	04:00	5	2	3	6	16
	05:00	11	18	16	20	65
	06:00	30	27	28	45	130
	07:00	54	48	64	68	234
	08:00	92	86	64	49	291
	09:00	47	52	44	38	181
	10:00	47	42	51	49	189
	11:00	51	48	67	39	205
	12:00	68	44	40	41	193
	13:00	54	58	38	47	197
	14:00	65	56	63	65	249
	15:00	77	60	73	66	276
	16:00	65	46	75	66	252
	17:00	79	40	51	39	209
	18:00	55	33	35	25	148
	19:00	51	31	21	15	118
	20:00	28	23	22	19	92
	21:00	26	22	17	13	78
	22:00	6	3	18	15	42
	23:00	24	3	2	6	35
Day Total :						3247

AM Total :	1358 (41.8%)	Peak AM Hour : 07:30 =	310 (9.5%)	Peak AM Factor : 0.842	Average Period : 33.8
PM Total :	1889 (58.2%)	Peak PM Hour : 15:00 =	276 (8.5%)	Peak PM Factor : 0.873	Average Hour : 135.3

Date	Time	:00	:15	:30	:45	Total
05/04/18	00:00	8	1	5	2	16
Fri	01:00	8	2	4	1	15
	02:00	2	1	1	1	5
	03:00	0	0	2	3	5
	04:00	2	6	5	5	18
	05:00	16	14	20	18	68
	06:00	18	26	38	31	113
	07:00	55	45	48	55	203
	08:00	50	80	70	49	249
	09:00	50	52	52	52	206
	10:00	48	53	45	50	196
	11:00	64	48	50	55	217
	12:00	58	46	67	58	229
	13:00	52	44	41	45	182
	14:00	55	53	61	61	230
	15:00	89	64	68	61	282
	16:00	79	56	69	59	263
	17:00	62	44	43	41	190
	18:00	48	30	58	28	164
	19:00	38	32	27	18	115
	20:00	18	21	27	18	84
	21:00	44	27	8	17	96
	22:00	45	11	6	8	70
	23:00	13	3	5	10	31
Day Total :						3247

AM Total :	1311 (40.4%)	Peak AM Hour : 07:45 =	255 (7.9%)	Peak AM Factor : 0.797	Average Period : 33.8
PM Total :	1936 (59.6%)	Peak PM Hour : 14:45 =	282 (8.7%)	Peak PM Factor : 0.792	Average Hour : 135.3

Basic Volume Summary: 212002 WB

Grand Total For Data From: 00:00 - 04/28/2018 To: 23:59 - 05/04/2018

Lane	Total Count		# Of Days	ADT	Avg. Period	Avg. Hour	AM Total & Percent	PM Total & Percent
#1.	15861	(42.8%)	7.00	2266	23.6	94.4	6026 (38.0%)	9835 (62.0%)
#2.	21232	(57.2%)	7.00	3033	31.6	126.4	8543 (40.2%)	12689 (59.8%)
ALL	37093		7.00	5299	55.2	220.8	14569 (39.3%)	22524 (60.7%)

Lane	Peak AM Hour		Date	Peak AM Factor	Peak PM Hour		Date	Peak PM Factor
#1.	08:15 =	215	05/02/2018	0.840	16:00 =	217	05/03/2018	0.889
#2.	08:00 =	333	05/01/2018	0.876	14:30 =	291	04/30/2018	0.791

Registered Traffic Volumes & Projections

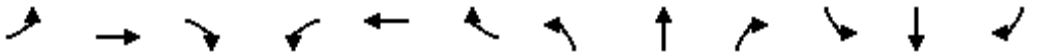
Volumes at AM and PM Peak Hours															
Elgin St E/Birchwood Trail			Eastbound			Northbound			Westbound			Southbound			Volume Type
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Sep 15	2020	AM	62	297	1	3	3	1	3	335	55	41	3	68	Registered Volumes
Sep 14	2020	PM	60	385	9	1	2	5	4	353	53	36	1	31	Registered Volumes
Annual Growth Rate 2.00%															
	2022	AM	65	309	1	3	3	1	3	349	57	43	3	71	Projected
	2022	PM	62	401	9	1	2	5	4	367	55	37	1	32	Projected
	2027	AM	71	341	1	3	3	1	3	385	63	47	3	78	Projected
	2027	PM	69	442	10	1	2	6	5	405	61	41	1	36	Projected

Volumes at AM and PM Peak Hours															
Elgin St E/D'Arcy St			Eastbound			Northbound			Westbound			Southbound			Volume Type
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Sep 15	2020	AM	18	140	131	150	3	15	20	203	4	4	5	24	Registered Volumes
Sep 14	2020	PM	21	263	132	144	4	17	14	183	3	5	4	6	Registered Volumes
Annual Growth Rate 2.00%															
	2022	AM	19	146	136	156	3	16	21	211	4	4	5	25	Projected
	2022	PM	22	274	137	150	4	18	15	190	3	5	4	6	Projected
	2027	AM	21	161	150	172	3	17	23	233	5	5	6	28	Projected
	2027	PM	24	302	152	165	5	20	16	210	3	6	5	7	Projected

Volumes at AM and PM Peak Hours															
Elgin St E/Brook Rd N			Eastbound			Northbound			Westbound			Southbound			Volume Type
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Sep 15	2020	AM	0	52	93	100	0	11	21	81	0	0	0	0	Registered Volumes
Sep 14	2020	PM	0	132	114	124	0	16	22	74	0	0	0	0	Registered Volumes
Annual Growth Rate 2.00%															
	2022	AM	0	54	97	104	0	11	22	84	0	0	0	0	Projected
	2022	PM	0	137	119	129	0	17	23	77	0	0	0	0	Projected
	2027	AM	0	60	107	115	0	13	24	93	0	0	0	0	Projected
	2027	PM	0	152	131	142	0	18	25	85	0	0	0	0	Projected

Appendix C

Synchro Reports – Existing Conditions 2020

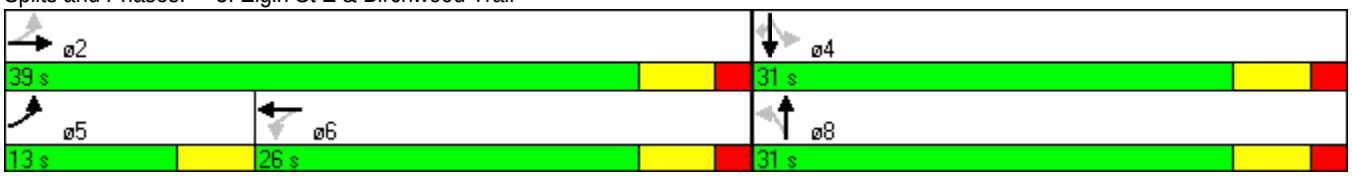


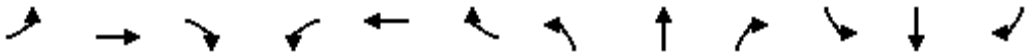
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	297	1	3	335	55	3	3	1	41	3	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (m)	75.0		2.5	75.0		2.5	2.5		2.5	2.5		20.0
Satd. Flow (prot)	1362	2767	0	1825	3318	0	0	1616	0	0	1722	1498
Flt Permitted	0.449			0.556				0.897			0.735	
Satd. Flow (perm)	644	2767	0	1068	3318	0	0	1481	0	0	1325	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			27			1				74
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		384.8			561.7			262.3			261.2	
Travel Time (s)		27.7			40.4			23.6			23.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	34%	32%	0%	0%	6%	18%	33%	0%	0%	7%	0%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	324	0	3	424	0	0	7	0	0	48	74
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Minimum Split (s)	11.0	22.0		22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (s)	13.0	39.0	0.0	26.0	26.0	0.0	31.0	31.0	0.0	31.0	31.0	31.0
Total Split (%)	18.6%	55.7%	0.0%	37.1%	37.1%	0.0%	44.3%	44.3%	0.0%	44.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	None
Act Effct Green (s)	41.3	40.7		33.5	33.5			15.2			15.2	15.2
Actuated g/C Ratio	0.67	0.66		0.54	0.54			0.25			0.25	0.25
v/c Ratio	0.13	0.18		0.01	0.23			0.02			0.15	0.17
Control Delay	6.0	6.5		13.0	11.4			16.3			19.6	6.4
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	6.0	6.5		13.0	11.4			16.3			19.6	6.4
LOS	A	A		B	B			B			B	A
Approach Delay		6.4			11.5			16.3			11.6	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	2.8	8.5		0.2	16.0			0.5			4.1	0.0
Queue Length 95th (m)	7.0	14.1		1.7	26.6			3.1			11.1	8.1
Internal Link Dist (m)		360.8			537.7			238.3			237.2	
Turn Bay Length (m)	30.0			30.0								10.0
Base Capacity (vph)	536	1821		579	1811			607			542	657
Starvation Cap Reductn	0	0		0	0			0			0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.13	0.18		0.01	0.23			0.01			0.09	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 61.8			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.23			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Elgin St E & Birchwood Trail





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	18	140	131	20	203	4	150	3	15	4	5	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	152	142	22	221	4	163	3	16	4	5	26

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	172	142	247	183	36
Volume Left (vph)	20	0	22	163	4
Volume Right (vph)	0	142	4	16	26
Hadj (s)	0.20	-0.58	0.13	0.32	-0.36
Departure Headway (s)	5.6	4.8	5.2	5.6	5.3
Degree Utilization, x	0.27	0.19	0.35	0.29	0.05
Capacity (veh/h)	608	710	664	594	597
Control Delay (s)	9.5	7.8	11.0	10.9	8.5
Approach Delay (s)	8.7		11.0	10.9	8.5
Approach LOS	A		B	B	A

Intersection Summary				
Delay	9.9			
HCM Level of Service	A			
Intersection Capacity Utilization	46.4%	ICU Level of Service	A	
Analysis Period (min)	15			

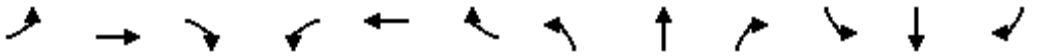
Intersection: 6: Elgin St E & D'Arcy St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	LTR	LTR
Maximum Queue (m)	20.6	16.8	19.8	22.6	9.4
Average Queue (m)	14.5	11.3	15.2	13.5	5.0
95th Queue (m)	24.1	17.0	21.6	23.4	12.1
Link Distance (m)	551.0	551.0	854.6	268.2	257.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	52	93	21	81	100	11
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)	57	101	23	88	109	12
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			158		241	107
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			158		241	107
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			98		85	99
cM capacity (veh/h)			1404		723	952

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	158	111	121
Volume Left	0	23	109
Volume Right	101	0	12
cSH	1700	1404	740
Volume to Capacity	0.09	0.02	0.16
Queue Length 95th (m)	0.0	0.4	4.4
Control Delay (s)	0.0	1.7	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	1.7	10.8
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

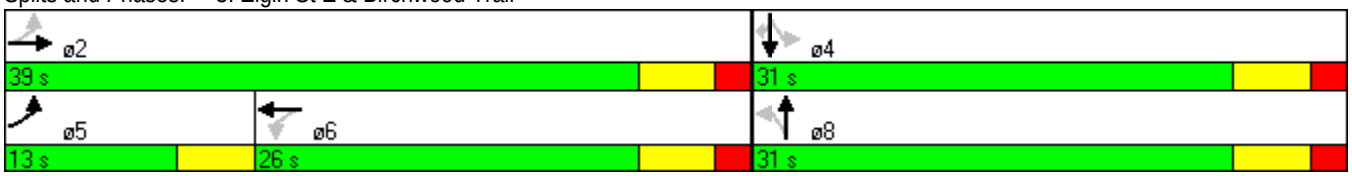


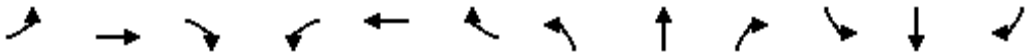
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	385	9	4	353	53	1	2	5	36	1	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (m)	75.0		2.5	75.0		2.5	2.5		2.5	2.5		20.0
Satd. Flow (prot)	1825	3499	0	1825	3473	0	0	1749	0	0	1731	1633
Flt Permitted	0.442			0.503				0.961			0.726	
Satd. Flow (perm)	849	3499	0	966	3473	0	0	1691	0	0	1318	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			24			5				34
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		384.8			561.7			262.3			261.2	
Travel Time (s)		27.7			40.4			23.6			23.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	3%	3%	0%	0%	0%	6%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	428	0	4	442	0	0	8	0	0	40	34
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Minimum Split (s)	11.0	22.0		22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (s)	13.0	39.0	0.0	26.0	26.0	0.0	31.0	31.0	0.0	31.0	31.0	31.0
Total Split (%)	18.6%	55.7%	0.0%	37.1%	37.1%	0.0%	44.3%	44.3%	0.0%	44.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	None
Act Effct Green (s)	41.5	42.0		35.6	35.6			15.0			15.0	15.0
Actuated g/C Ratio	0.72	0.73		0.62	0.62			0.26			0.26	0.26
v/c Ratio	0.09	0.17		0.01	0.20			0.02			0.12	0.08
Control Delay	5.3	5.4		12.5	10.4			13.1			18.4	7.7
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	5.3	5.4		12.5	10.4			13.1			18.4	7.7
LOS	A	A		B	B			B			B	A
Approach Delay		5.4			10.4			13.1			13.5	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	2.7	11.2		0.3	16.9			0.3			3.4	0.0
Queue Length 95th (m)	6.6	17.5		1.9	27.0			3.0			9.8	5.4
Internal Link Dist (m)		360.8			537.7			238.3			237.2	
Turn Bay Length (m)	30.0			30.0								10.0
Base Capacity (vph)	765	2556		597	2157			739			573	730
Starvation Cap Reductn	0	0		0	0			0			0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.08	0.17		0.01	0.20			0.01			0.07	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 57.6			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.20			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Elgin St E & Birchwood Trail





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	21	263	132	14	183	3	144	4	17	5	4	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	286	143	15	199	3	157	4	18	5	4	7

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	309	143	217	179	16
Volume Left (vph)	23	0	15	157	5
Volume Right (vph)	0	143	3	18	7
Hadj (s)	0.07	-0.67	0.05	0.15	-0.17
Departure Headway (s)	5.4	4.7	5.2	5.6	5.7
Degree Utilization, x	0.46	0.19	0.31	0.28	0.03
Capacity (veh/h)	642	747	664	593	551
Control Delay (s)	11.8	7.5	10.5	10.8	8.8
Approach Delay (s)	10.4		10.5	10.8	8.8
Approach LOS	B		B	B	A

Intersection Summary				
Delay	10.5			
HCM Level of Service	B			
Intersection Capacity Utilization	43.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 6: Elgin St E & D'Arcy St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	LTR	LTR
Maximum Queue (m)	20.8	15.6	16.4	13.5	8.1
Average Queue (m)	15.2	10.6	13.1	8.9	3.8
95th Queue (m)	22.5	15.9	18.8	15.2	10.3
Link Distance (m)	551.0	551.0	854.6	268.2	257.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

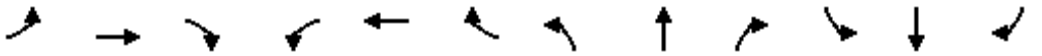
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	132	114	22	74	124	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	143	124	24	80	135	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			267		334	205
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			267		334	205
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		79	98
cM capacity (veh/h)			1308		649	840

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	267	104	152
Volume Left	0	24	135
Volume Right	124	0	17
cSH	1700	1308	667
Volume to Capacity	0.16	0.02	0.23
Queue Length 95th (m)	0.0	0.4	6.7
Control Delay (s)	0.0	1.9	12.0
Lane LOS		A	B
Approach Delay (s)	0.0	1.9	12.0
Approach LOS			B

Intersection Summary			
Average Delay		3.9	
Intersection Capacity Utilization		36.9%	ICU Level of Service
Analysis Period (min)		15	

Appendix D

Synchro Reports – Total Volumes 2022

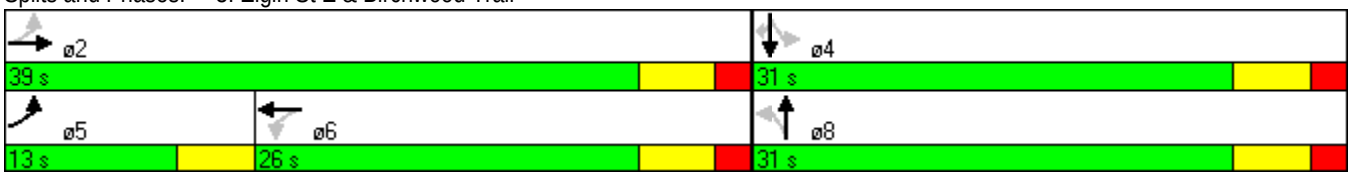


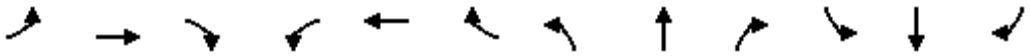
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	310	1	3	335	57	3	3	1	43	3	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (m)	75.0		2.5	75.0		2.5	2.5		2.5	2.5		20.0
Satd. Flow (prot)	1362	2767	0	1825	3313	0	0	1616	0	0	1721	1498
Flt Permitted	0.441			0.548				0.897			0.734	
Satd. Flow (perm)	632	2767	0	1053	3313	0	0	1481	0	0	1323	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			28			1				77
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		384.8			561.7			262.3			261.2	
Travel Time (s)		27.7			40.4			23.6			23.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	34%	32%	0%	0%	6%	18%	33%	0%	0%	7%	0%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	338	0	3	426	0	0	7	0	0	50	77
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Minimum Split (s)	11.0	22.0		22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (s)	13.0	39.0	0.0	26.0	26.0	0.0	31.0	31.0	0.0	31.0	31.0	31.0
Total Split (%)	18.6%	55.7%	0.0%	37.1%	37.1%	0.0%	44.3%	44.3%	0.0%	44.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	None
Act Effct Green (s)	39.4	38.7		29.7	29.7			15.0			15.0	15.0
Actuated g/C Ratio	0.66	0.65		0.50	0.50			0.25			0.25	0.25
v/c Ratio	0.14	0.19		0.01	0.26			0.02			0.15	0.18
Control Delay	6.2	6.6		13.0	12.6			16.3			19.2	6.4
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	6.2	6.6		13.0	12.6			16.3			19.2	6.4
LOS	A	A		B	B			B			B	A
Approach Delay		6.6			12.6			16.3			11.4	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	3.0	9.0		0.2	16.0			0.5			4.3	0.0
Queue Length 95th (m)	7.3	14.7		1.7	26.8			3.1			11.5	8.2
Internal Link Dist (m)		360.8			537.7			238.3			237.2	
Turn Bay Length (m)	30.0			30.0								10.0
Base Capacity (vph)	526	1791		523	1660			622			555	673
Starvation Cap Reductn	0	0		0	0			0			0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.13	0.19		0.01	0.26			0.01			0.09	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 59.8			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 9.9		Intersection LOS: A	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Elgin St E & Birchwood Trail





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	19	147	136	22	215	4	156	3	16	4	5	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	160	148	24	234	4	170	3	17	4	5	27

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	180	148	262	190	37
Volume Left (vph)	21	0	24	170	4
Volume Right (vph)	0	148	4	17	27
Hadj (s)	0.20	-0.58	0.13	0.32	-0.37
Departure Headway (s)	5.7	4.9	5.2	5.7	5.4
Degree Utilization, x	0.29	0.20	0.38	0.30	0.06
Capacity (veh/h)	602	701	657	576	582
Control Delay (s)	9.7	7.9	11.4	11.2	8.7
Approach Delay (s)	8.9		11.4	11.2	8.7
Approach LOS	A		B	B	A

Intersection Summary				
Delay	10.2			
HCM Level of Service	B			
Intersection Capacity Utilization	48.0%	ICU Level of Service	A	
Analysis Period (min)	15			

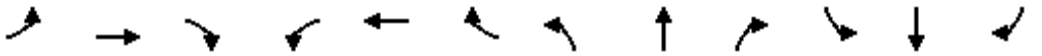
Intersection: 6: Elgin St E & D'Arcy St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	LTR	LTR
Maximum Queue (m)	22.6	19.2	22.7	17.5	8.2
Average Queue (m)	14.6	13.6	17.6	11.6	4.8
95th Queue (m)	25.7	21.4	24.7	20.1	11.3
Link Distance (m)	551.0	551.0	854.6	268.2	257.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	55	99	22	85	104	11
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)	60	108	24	92	113	12
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			167		254	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			167		254	114
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			98		84	99
cM capacity (veh/h)			1392		710	945

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	167	116	125
Volume Left	0	24	113
Volume Right	108	0	12
cSH	1700	1392	727
Volume to Capacity	0.10	0.02	0.17
Queue Length 95th (m)	0.0	0.4	4.7
Control Delay (s)	0.0	1.7	11.0
Lane LOS		A	B
Approach Delay (s)	0.0	1.7	11.0
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		

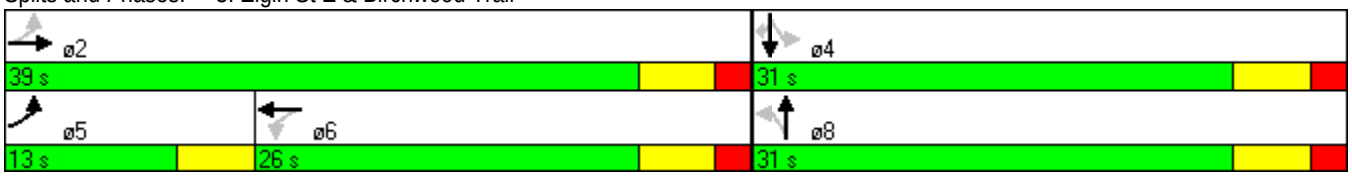


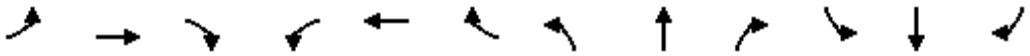
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	405	9	4	367	55	1	2	5	38	1	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (m)	75.0		2.5	75.0		2.5	2.5		2.5	2.5		20.0
Satd. Flow (prot)	1825	3502	0	1825	3473	0	0	1749	0	0	1730	1633
Flt Permitted	0.435			0.492				0.960			0.726	
Satd. Flow (perm)	836	3502	0	945	3473	0	0	1689	0	0	1318	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			24			5				35
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		384.8			561.7			262.3			261.2	
Travel Time (s)		27.7			40.4			23.6			23.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	3%	3%	0%	0%	0%	6%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	450	0	4	459	0	0	8	0	0	42	35
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Minimum Split (s)	11.0	22.0		22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (s)	13.0	39.0	0.0	26.0	26.0	0.0	31.0	31.0	0.0	31.0	31.0	31.0
Total Split (%)	18.6%	55.7%	0.0%	37.1%	37.1%	0.0%	44.3%	44.3%	0.0%	44.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	None
Act Effct Green (s)	41.5	42.0		35.6	35.6			15.0			15.0	15.0
Actuated g/C Ratio	0.72	0.73		0.62	0.62			0.26			0.26	0.26
v/c Ratio	0.09	0.18		0.01	0.21			0.02			0.12	0.08
Control Delay	5.3	5.4		12.5	10.4			13.1			18.5	7.6
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	5.3	5.4		12.5	10.4			13.1			18.5	7.6
LOS	A	A		B	B			B			B	A
Approach Delay		5.4			10.5			13.1			13.5	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	2.8	11.8		0.3	17.6			0.3			3.6	0.0
Queue Length 95th (m)	6.8	18.4		1.9	28.2			3.0			10.2	5.5
Internal Link Dist (m)		360.8			537.7			238.3			237.2	
Turn Bay Length (m)	30.0			30.0								10.0
Base Capacity (vph)	757	2558		584	2156			738			573	731
Starvation Cap Reductn	0	0		0	0			0			0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.09	0.18		0.01	0.21			0.01			0.07	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 57.6			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.21			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Elgin St E & Birchwood Trail





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	22	279	137	15	192	3	150	4	18	5	4	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	303	149	16	209	3	163	4	20	5	4	7

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	327	149	228	187	16
Volume Left (vph)	24	0	16	163	5
Volume Right (vph)	0	149	3	20	7
Hadj (s)	0.07	-0.67	0.05	0.15	-0.17
Departure Headway (s)	5.4	4.7	5.2	5.7	5.8
Degree Utilization, x	0.49	0.19	0.33	0.30	0.03
Capacity (veh/h)	637	739	655	575	536
Control Delay (s)	12.5	7.6	10.8	11.1	8.9
Approach Delay (s)	11.0		10.8	11.1	8.9
Approach LOS	B		B	B	A

Intersection Summary				
Delay	10.9			
HCM Level of Service	B			
Intersection Capacity Utilization	45.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 6: Elgin St E & D'Arcy St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	LTR	LTR
Maximum Queue (m)	24.8	13.5	22.5	18.7	8.2
Average Queue (m)	18.0	10.4	15.3	11.8	2.9
95th Queue (m)	27.1	15.2	24.8	20.5	9.2
Link Distance (m)	551.0	551.0	854.6	268.2	257.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

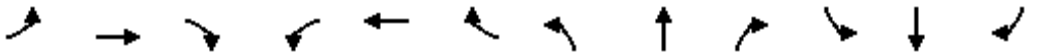
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	138	120	23	78	131	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	150	130	25	85	142	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			280		350	215
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			280		350	215
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		78	98
cM capacity (veh/h)			1294		635	830

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	280	110	161
Volume Left	0	25	142
Volume Right	130	0	18
cSH	1700	1294	652
Volume to Capacity	0.16	0.02	0.25
Queue Length 95th (m)	0.0	0.4	7.3
Control Delay (s)	0.0	1.9	12.3
Lane LOS		A	B
Approach Delay (s)	0.0	1.9	12.3
Approach LOS			B

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E

Synchro Reports – Total Volumes 2027

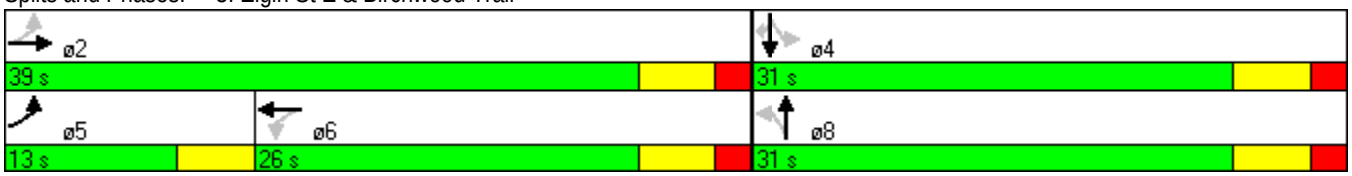


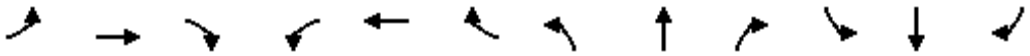
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	342	1	3	389	63	3	3	1	47	3	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (m)	75.0		2.5	75.0		2.5	2.5		2.5	2.5		20.0
Satd. Flow (prot)	1362	2767	0	1825	3319	0	0	1616	0	0	1721	1498
Flt Permitted	0.419			0.530				0.895			0.733	
Satd. Flow (perm)	601	2767	0	1018	3319	0	0	1478	0	0	1321	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					26			1				85
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		384.8			561.7			262.3			261.2	
Travel Time (s)		27.7			40.4			23.6			23.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	34%	32%	0%	0%	6%	18%	33%	0%	0%	7%	0%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	373	0	3	491	0	0	7	0	0	54	85
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Minimum Split (s)	11.0	22.0		22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (s)	13.0	39.0	0.0	26.0	26.0	0.0	31.0	31.0	0.0	31.0	31.0	31.0
Total Split (%)	18.6%	55.7%	0.0%	37.1%	37.1%	0.0%	44.3%	44.3%	0.0%	44.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	None
Act Effct Green (s)	40.5	39.9		32.7	32.7			15.1			15.1	15.1
Actuated g/C Ratio	0.66	0.65		0.54	0.54			0.25			0.25	0.25
v/c Ratio	0.16	0.21		0.01	0.27			0.02			0.17	0.20
Control Delay	6.3	6.7		13.0	12.0			16.3			19.7	6.3
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	6.3	6.7		13.0	12.0			16.3			19.7	6.3
LOS	A	A		B	B			B			B	A
Approach Delay		6.6			12.0			16.3			11.5	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	3.3	10.1		0.2	19.2			0.5			4.6	0.0
Queue Length 95th (m)	7.8	16.3		1.7	31.5			3.1			12.2	8.6
Internal Link Dist (m)		360.8			537.7			238.3			237.2	
Turn Bay Length (m)	30.0			30.0								10.0
Base Capacity (vph)	513	1809		546	1792			611			546	669
Starvation Cap Reductn	0	0		0	0			0			0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.15	0.21		0.01	0.27			0.01			0.10	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 61			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.27			
Intersection Signal Delay: 9.7		Intersection LOS: A	
Intersection Capacity Utilization 52.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Elgin St E & Birchwood Trail





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	21	162	150	24	237	5	172	3	17	5	6	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	176	163	26	258	5	187	3	18	5	7	30

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	199	163	289	209	42
Volume Left (vph)	23	0	26	187	5
Volume Right (vph)	0	163	5	18	30
Hadj (s)	0.20	-0.58	0.13	0.32	-0.36
Departure Headway (s)	5.8	5.1	5.4	5.9	5.6
Degree Utilization, x	0.32	0.23	0.43	0.34	0.07
Capacity (veh/h)	586	680	638	559	549
Control Delay (s)	10.4	8.3	12.4	11.9	9.0
Approach Delay (s)	9.5		12.4	11.9	9.0
Approach LOS	A		B	B	A

Intersection Summary				
Delay	11.0			
HCM Level of Service	B			
Intersection Capacity Utilization	51.2%	ICU Level of Service	A	
Analysis Period (min)	15			

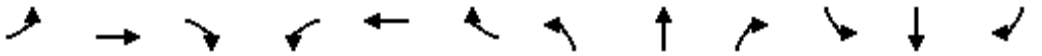
Intersection: 6: Elgin St E & D'Arcy St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	LTR	LTR
Maximum Queue (m)	20.7	19.6	23.9	19.4	8.2
Average Queue (m)	14.3	13.5	16.5	12.9	4.4
95th Queue (m)	23.0	21.9	24.9	21.4	10.9
Link Distance (m)	551.0	551.0	854.6	268.2	257.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	61	109	24	94	115	13
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)	66	118	26	102	125	14
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			185		280	126
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			185		280	126
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			98		82	98
cM capacity (veh/h)			1372		684	930

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	185	128	139
Volume Left	0	26	125
Volume Right	118	0	14
cSH	1700	1372	703
Volume to Capacity	0.11	0.02	0.20
Queue Length 95th (m)	0.0	0.4	5.6
Control Delay (s)	0.0	1.7	11.4
Lane LOS		A	B
Approach Delay (s)	0.0	1.7	11.4
Approach LOS			B

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

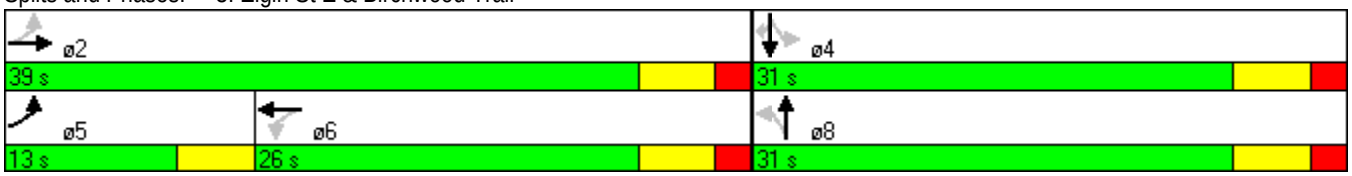


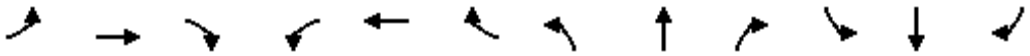
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	446	10	5	405	61	1	2	6	42	1	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (m)	75.0		2.5	75.0		2.5	2.5		2.5	2.5		20.0
Satd. Flow (prot)	1825	3502	0	1825	3473	0	0	1732	0	0	1729	1633
Flt Permitted	0.416			0.470				0.967			0.724	
Satd. Flow (perm)	799	3502	0	903	3473	0	0	1683	0	0	1314	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			24			7				39
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		384.8			561.7			262.3			261.2	
Travel Time (s)		27.7			40.4			23.6			23.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	3%	3%	0%	0%	0%	6%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	496	0	5	506	0	0	10	0	0	47	39
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Minimum Split (s)	11.0	22.0		22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (s)	13.0	39.0	0.0	26.0	26.0	0.0	31.0	31.0	0.0	31.0	31.0	31.0
Total Split (%)	18.6%	55.7%	0.0%	37.1%	37.1%	0.0%	44.3%	44.3%	0.0%	44.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	None
Act Effct Green (s)	41.5	42.0		35.6	35.6			15.0			15.0	15.0
Actuated g/C Ratio	0.72	0.73		0.62	0.62			0.26			0.26	0.26
v/c Ratio	0.11	0.19		0.01	0.24			0.02			0.14	0.09
Control Delay	5.4	5.5		12.6	10.6			12.3			18.7	7.4
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	5.4	5.5		12.6	10.6			12.3			18.7	7.4
LOS	A	A		B	B			B			B	A
Approach Delay		5.5			10.7			12.3			13.5	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	3.1	13.3		0.4	19.8			0.3			4.0	0.0
Queue Length 95th (m)	7.4	20.3		2.2	31.5			3.2			11.0	5.9
Internal Link Dist (m)		360.8			537.7			238.3			237.2	
Turn Bay Length (m)	30.0			30.0								10.0
Base Capacity (vph)	736	2558		557	2153			736			572	733
Starvation Cap Reductn	0	0		0	0			0			0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.10	0.19		0.01	0.24			0.01			0.08	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 57.6			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.24			
Intersection Signal Delay: 8.4		Intersection LOS: A	
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Elgin St E & Birchwood Trail





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	24	307	152	16	212	3	165	5	20	6	5	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	334	165	17	230	3	179	5	22	7	5	8

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	360	165	251	207	20
Volume Left (vph)	26	0	17	179	7
Volume Right (vph)	0	165	3	22	8
Hadj (s)	0.07	-0.67	0.05	0.15	-0.17
Departure Headway (s)	5.6	4.8	5.4	5.9	6.0
Degree Utilization, x	0.56	0.22	0.38	0.34	0.03
Capacity (veh/h)	623	719	635	559	506
Control Delay (s)	14.2	8.0	11.6	11.9	9.2
Approach Delay (s)	12.3		11.6	11.9	9.2
Approach LOS	B		B	B	A

Intersection Summary				
Delay	12.0			
HCM Level of Service	B			
Intersection Capacity Utilization	48.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 6: Elgin St E & D'Arcy St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	LTR	LTR
Maximum Queue (m)	31.8	15.2	21.6	15.2	6.5
Average Queue (m)	20.9	11.9	17.1	10.5	3.5
95th Queue (m)	35.4	17.8	24.9	18.3	10.0
Link Distance (m)	551.0	551.0	854.6	268.2	257.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	153	132	25	86	144	18
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)	166	143	27	93	157	20
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			310		386	238
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			310		386	238
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		74	98
cM capacity (veh/h)			1262		604	806

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	310	121	176
Volume Left	0	27	157
Volume Right	143	0	20
cSH	1700	1262	621
Volume to Capacity	0.18	0.02	0.28
Queue Length 95th (m)	0.0	0.5	8.8
Control Delay (s)	0.0	1.9	13.1
Lane LOS		A	B
Approach Delay (s)	0.0	1.9	13.1
Approach LOS			B

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix F

Parking Survey Sheet

D'Arcy St Apartments (Cobourg)
Unit Block 906 - 920, Unit Block 492 - 478, Unit Block 462 -476
(Total Number of Units = 24)

Date: Sep 15, 2020 (Mon - Tue) **Parked Cars at beginning of time:** 12

From	To	IN	OUT	Total
16:45	17:00			
17:00	17:15			
17:15	17:30	1	2	11
17:30	17:45	2	1	12
17:45	18:00	2	1	13
18:00	18:15	1	0	14
18:15	18:30	3	2	15
18:30	18:45	1	0	16
18:45	19:00	0	1	15
19:00	19:15	1	2	14
19:15	19:30	0	0	14
19:30	19:45	1	0	15
19:45	20:00	2	1	16
20:00	20:15	2	0	18
20:15	20:30	3	3	18
20:30	20:45	6	8	16
20:45	21:00	5	2	19
21:00	21:15	1	1	19
21:15	21:30	2	1	20
21:30	21:45	1	1	20
21:45	22:00	1	2	19
22:00	22:15	2	0	21
22:15	22:30	0	1	20
22:30	22:45	0	0	20
22:45	23:00	0	0	20
23:00	23:15	0	0	20
23:15	23:30	0	0	20
23:30	23:45	0	0	20
23:45	0:00	1	0	21
0:00	0:15	0	0	21
0:15	0:30	0	0	21
0:30	0:45	0	0	21
0:45	1:00	0	1	20

From	To	IN	OUT	Total
1:00	1:15	0	0	20
1:15	1:30	0	0	20
1:30	1:45	0	0	20
1:45	2:00	0	0	20
2:00	2:15	0	0	20
2:15	2:30	0	0	20
2:30	2:45	0	0	20
2:45	3:00	0	0	20
3:00	3:15	0	0	20
3:15	3:30	0	0	20
3:30	3:45	0	0	20
3:45	4:00	0	0	20
4:00	4:15	0	1	19
4:15	4:30	0	0	19
4:30	4:45	0	0	19
4:45	5:00	0	1	18
5:00	5:15	0	0	18
5:15	5:30	0	1	17
5:30	5:45	0	0	17
5:45	6:00	0	0	17
6:00	6:15	0	0	17
6:15	6:30	0	2	15
6:30	6:45	0	1	14
6:45	7:00	0	1	13
7:00	7:15	0	1	12
7:15	7:30	1	1	12
7:30	7:45	0	0	12
7:45	8:00	0	0	12