TRANSPORTATION STUDY

March 2023

Proposed Mixed-use Development
535 Bayfield Street,
Barrie, Ontario

Prepared for
2709557 Ontario Inc.

c/o
Evans Planning Inc.

TRANS-PLAN
Transportation Engineering

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March 17, 2023

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Re: Proposed Mixed-use Development, 535 Bayfield Street, Barrie, ON – Transportation Study

TRANS-PLAN is pleased to submit this Transportation Study in support of the proposed mixed-use development located at 535 Bayfield Street, in the City of Barrie. The site is located on the southeast quadrant of Bayfield Street and Hanmer Street West, in the City of Barrie. The existing commercial one-storey building located on the north side will remain the same with a GFA of 2,954.50 sqm. Two new four-storey mixed-use buildings are proposed with a total of 48 units and 234 sq.m. ground floor retail area.

Our Traffic Impact Study findings indicate that the proposed development is acceptable for traffic operations. No further roadway improvements would be required to support the development. The accesses for the subject site are expected to operate well with the proposed design.

The expected peak parking demand would be 142 spaces, which could be accommodated by the proposed parking supply of 158 spaces resulting in a potential surplus of 16 spaces. A Transportation Demand Management plan has been included in this study to encourage travel by alternative modes and to increase tenants' awareness of the various travel options available.

Our Construction Management Plan describes how the site would operate during construction activities, including vehicle access points and truck routing. A traffic signage and pavement marking plan is included, showing the placement of on-site pavement markings and traffic signage, as per the Ontario Traffic Manual guidelines. Our Site Circulation Review shows that the proposed driveway and internal drive aisles can accommodate waste collection, loading / delivery, fire trucks and passenger vehicles.

Sincerely,

Anil Seegobin, P.Eng.
Partner, Engineer

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Traffic Analyst

Trans-Plan Transportation Inc.
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1. INTRODUCTION

Trans-Plan has been retained to complete a Transportation Study for a proposed mixed-use development. Our study includes the following scope of work:

Traffic Impact Study

- A review and assessment of the existing road network
- An assessment of boundary road operations under future background conditions, including a review of traffic growth, area developments and proposed transportation improvements in the study area
- An assessment of the impact of site-generated traffic on the study area intersections under future traffic conditions
- Recommendations to mitigate any identified traffic impacts on the boundary roadways, resulting from the proposed development

Traffic Demand Management (TDM) Plan

- A review of the study area roadways for transit and active transportation facilities
- A review of TDM guidelines to determine the TDM measures that would be appropriate for the planned development in terms of context, scale and land use

Parking Justification Study

- A review of the City's Zoning By-law for parking requirements in comparison to the proposed parking supply
- Parking utilization surveys of a similar commercial development (proxy site) located in the surrounding study area
- an estimation of future parking demands, based on surveys of the proxy site, applying surveyed rates
- providing parking recommendations for the proposed development, including confirmation that the existing / proposed on-site parking supply is sufficient to accommodate the uses

Signage and Pavement Markings Plan

- A traffic control and signage plan showing the placement of on-site pavement markings and traffic signage, as per the City's Site Plan Manual and Ontario Traffic Manual guidelines.

Construction Management Plan

- A review of construction truck routing to and from the site
- A traffic staging plan showing temporary signage and barriers within the site

Site Circulation Review

- A review of on-site circulation for passenger vehicles, loading/waste collection trucks, and fire trucks, including turning templates for all design vehicles

2. CORRESPONDENCE

Prior to commencing this study, Transportation Planning staff at the City of Barrie were contacted and provided with our study terms of reference for their approval and / or comments. Traffic data, such as signal timing plans and annual growth rate were provided for our study by the City. The report adheres to the Traffic Impact Study Requirements outlined in Appendix 2 of City of Barrie Urban Design Manual, dated October 2014.

3. CITY OF BARRIE PRE-CONSULTATION COMMENTS

Trans-plan has incorporated responses based on the pre consultation comments received from the City of Barrie dated May 10, 2022 into this report. Notable comments that were included within the report are listed as follows:

- The TIS includes turning lane warrants in accordance with Transportation Association of Canada and MTO Geometric Design Guide and is discussed in further detail in section 15 of the report.
- Discussion involving the use of a full moves site access as opposed to being restricted to a right-in/right-out access is discussed in section 10.
- With regard to the Transportation Demand Management measures, the client shall consider providing pre-purchased monthly transit passes to tenants to promote utilizing transit and reduce the dependence on single occupant vehicles. Further discussion is provided in section 12.
- A parking justification report has been provided within the report in support of the deviation from the zoning by-law requirements. We discussed with City staff and agreed upon a proxy site and surveyed for two days in our correspondence on July, 2022. The proxy sites used for the parking justification study are further discussed in section 11 of the report.

4. SITE LOCATION

The site, shown in Figure 1, is municipally known as 535 Bayfield Street, Barrie. The site is located on the southeast quadrant of Bayfield Street and Hanmer Street West, in the City of Barrie. The site is currently occupied by two one-storey buildings, including a Tim Hortons and an abandoned building. A total of 104 surface parking spaces are provided on site. Located in the vicinity of the site are mainly commercial uses surrounded by residential community. Several commercial plazas with a variety of restaurants and retailers are located on both sides of Bayfield Street. Georgian Mall is located 100m south of the subject site. Highway 400 is located approximately 2.0 km south of the site.

5. PROPOSED DEVELOPMENT

The site plan, prepared Keith Loffer McAlpine Architects, is shown in Figure 2. The existing commercial one-storey building located on the north side (Building 1, currently vacant) will remain the same with a GFA of 2,954.50 sqm inclusive of a Day Care Centre with a proposed GFA of 759 sqm. The existing Tim Hortons currently in operation (Building 2) is to remain the same aswell. Two new four-storey mixed-use buildings are proposed with a total of 48 units and 234 sq.m. ground floor retail area. The site plan includes a total of 158 surface parking spaces. The existing full-moves site access off Bayfield Street and all internal connections with neighboring parking lots remain unchanged.

6. EXISTING CONDITIONS

6.1 Road Network

The major roadways located in the study area are described as follows:

Bayfield Street is classified as an arterial road under the jurisdiction of the City of Barrie. The roadway generally runs in a north-south direction and forms signalized intersections at Hanmer Street, Georgian Mall accesses and Livingstone Street. It consists of seven travel lanes, three lanes in each direction and one centre two-way left turn lane. The posted speed limit is 50 km/h within the vicinity of the subject site.

Hanmer Street is a local road under the jurisdiction of the City of Barrie. The roadway generally runs in an east-west direction. The roadway consists of two travel lanes east of Bayview Street (one in each direction) and four travel lanes west of Bayview Street (two in each direction). The posted speed limit of 50 km/h.

Livingstone Street is classified as an arterial road under the jurisdiction of the City of Barrie. The roadway generally runs in an east-west direction. It consists of four travel lanes, two lanes in each. The posted speed limit is 50 km/h within the vicinity of the subject site.

Bayfield Street forms signalized intersections at Hanmer Street, Georgian Mall accesses and Livingstone Street. The existing roadway characteristics in the study area are shown in Figure 3.

6.2 Traffic Counts

To determine existing operating conditions in the study area, Trans-Plan conducted intersection turning movement counts (TMCs) in the study area. Additionally, Trans-Plan obtained current signal timing plans from the City of Barrie. Table 1 provides a summary of the count date, count hours and peak hours obtained for each intersection counted. Detailed TMC data and current signal timing plans provided by the City are also included in Appendix A.

Table 1 – Intersection Turning Movement Count Details

Intersection	Count Date	Count Hours	Peak Hours
Bayfield Street at Hanmer Street	Tuesday July 13, 2021	7:00am – 9:30am 4:00pm – 6:30pm	8:00am – 9:00am 4:00pm – 5:00pm
Bayfield Street at site access			8:30am – 9:30am 4:00pm – 5:00pm
Bayfield Street at Georgian Mall North Access			8:30am – 9:30am 4:00pm – 5:00pm
Bayfield Street at Georgian Mall South Access	Tuesday December 11, 2018		8:00am – 9:00am 3:15pm – 4:15pm
Bayfield Street at Livingston Street			8:00am – 9:00am 4:30pm – 5:30pm

Source: City of Barrie and Trans-Plan

The existing traffic volumes along the study intersection corridors were reviewed for consistency of upstream and downstream traffic volumes and increased appropriately where required. The traffic

volumes were grown to the current 2023 year at a growth rate of 2 percent. The existing traffic volumes for the weekday AM and PM peak hours are shown in Figure 4.

6.3 Transit Service

The site is served by three transit routes connecting riders to major locations in Barrie. The transit system is operated by the City of Barrie, with the following bus routes within the study area:

Route 1B, Welham runs generally in a north-south direction. The route connects riders to several major locations, such as the Georgian Mall, Allandale Go station and Park Place. The nearest stop is located at Georgian Mall, approximately 150m north of the site.

Route 4, East Bayfield/South GO runs generally in a north-south direction. The route connects riders to several major locations, such as the Georgian Mall, Allandale Go station and Barrie South GO Station. The nearest stop is located at the intersection of Hanmer Street and Bayfield Street, approximately 350m south of the site.

Route 6, Letitia/College runs generally in a loop. The route connects riders to several major locations, such as the Downtown Terminal, Georgian Mall and Georgian College. The nearest stop is located at the intersection of Livingstone Street at Bayfield Street, approximately 700m south of the site.

Route 8B, Crosstown/Essa runs generally in a north-south direction. The route connects riders to several major locations, such as the Georgian College, Downtown Terminal, Allandale GO Station and Barrie South Go station. The nearest stop is located at the intersection of Livingstone Street at Bayfield Street, approximately 700m south of the site.

Route 100, Express runs in a loop. The route connects riders to several major locations, such as the Downtown Terminal, Georgian Mall and Georgian College. The nearest stop is located at Georgian Mall, approximately 150m south of the site.

Service details for each transit route are provided in Table 2. Figure 5 provides the local transit service map of Barrie within the study area.

Table 2 – Transit Service in the Study Area

Route	No.	Nearest Bus Stop at Site	Approximate Service Times		Approximate Peak Service Frequency (min)		
			Weekdays	Weekends	AM	PM	SAT
Welham	1	Georgian Mall	5:20am -11:20pm	7:00am -11:00pm	30	30	30
East Bayfield	4	Hanmer at Bayfield	5:35am – 11:06pm	7:26an – 11:06pm	50	50	60
Letitia/ College	6	Bayfield at Livingstone	6:16am -11:58pm	7:46am -11:46pm	30	30	30
Crosstown/ Essa	8B	Bayfield at Livingstone	5:33am - 11:33pm	7:11am - 11:41pm	30	30	30
Express	100	Georgian Mall	7:18am – 9:51pm	8:03am – 9:16pm	23	23	45

Source: Barrie Transit Website

7. FUTURE BACKGROUND CONDITIONS

Future background traffic volumes were determined based on a review of planned developments, road improvements and future traffic volume growth in the study area.

7.1 Horizon Years

The horizon years used for our analysis are described as follows:

- Existing conditions, year 2023
- 7-year horizon period, year 2030: five years after build-out

7.2 Background Growth Rate

Based on our correspondence with City staff, an annual growth rate of 2.0 % was applied to the major study area roadways (for all turning movements) for the future horizon year of this study.

7.3 Planned Background Developments and Improvements

From our review of City of Barrie Environmental Assessment studies and the City's Transportation Master Plan, there are currently no planned roadway or transit improvements in the study area. There are currently no planned background developments to consider within the study area, according to feedback on this study that was received from the City.

Based on our review of background conditions, the future background traffic volumes for the horizon years 2030 for the weekday AM and PM peak hours are shown in Figure 6.

8. SITE TRAFFIC

8.1 Trip Generation

City staff has advised for site trip generation purposes, it is suggested to assume 80% of GFA is Shopping Centre uses and the rest 20% is Medical/Dentist Office uses for Building 1. The existing 1-storey building

will include a Daycare use in the future consisting of 8,170 sq.ft of GFA. Trips for the proposed commercial plaza were generated using the Institute of Transportation Engineers (ITE) Trip Generation manuals, 11th Edition, using ITE Land Use Code (LUC) 822 – Strip Retail Plaza (<40k) for Retail uses in Building 1,3 and 4, LUC 720 - Medical/Dentist uses for 20% of uses in Building 1, LUC 565 – Day Care Centre for child care uses and LUC 221-Multifamily (Mid-Rise) for residential uses in Building 3 and 4. The site trip generation is provided in Table 3.

Table 3– Site Trip Generation

Land Use	Size		Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
Strip Retail Plaza (<40k)	20,921 sq.ft.	Distr.	60%	40%	100%	50%	50%	100%
		Equation	Ln(T) = 0.66 Ln(X) + 1.84			Ln(T) = 0.71 Ln(X) + 2.72		
		Rate	1.35	0.9	2.25	2.88	2.88	5.76
		Trips	28	19	47	65	66	131
Medical-Dental Office	5,230 sq.ft.	Distr.	79%	21%	100%	30%	70%	100%
		Equation	Ln(T) = 0.90Ln(X) + 1.34			T = 4.07(X) - 3.17		
		Rate	2.57	0.68	3.25	1.03	2.41	3.44
		Trips	13	4	17	5	13	18
Day Care Centre	8,170 Sq.ft	Distr.	53%	47%	100%	47%	53%	100%
		Equation	N/A			N/A		
		Rate	5.83	5.17	11.0	5.23	5.89	11.12
		Trips	48	42	90	43	48	91
Multifamily (Mid-Rise)	48 units	Distr.	23%	77%	100%	61%	39%	100%
		Equation	T = 0.44(X) - 11.61			T = 0.39(X) + 0.34		
		Rate	0.05	0.16	0.21	0.24	0.16	0.4
		Trips	2	8	10	12	7	19
	Subtotal		91	73	164	125	134	259
	Internal Reduction (10%)		9	7	16	13	13	26
	Total New Trips		**82**	**66**	**148**	**112**	**121**	**233**

The subject site is expected to generate 148 and 233 two-way trips in the weekday AM and PM peak hours, respectively.

8.2 Trip Distribution and Assignment

Site trips for the proposed development were assigned and distributed to / from the site and the boundary roadways based on existing traffic patterns of the study area obtained from our traffic counts. The traffic entering / exiting the subject site is expected to use Bayfield Street since there are no alternative routes

to / from the site. Traffic exiting the site onto Bayfield Street would likely use Highway 400 for long distance travel. The site traffic assignment for the weekday AM and PM peak hours are shown in Figure 7.

9. FUTURE TOTAL TRAFFIC CONDITIONS

Site traffic volumes were added to the future background traffic volumes to obtain future total traffic volumes for the peak hours. The future total traffic volumes for 2030 horizon year, weekday AM and PM and SAT peak hours, are shown in Figure 8.

10. CAPACITY AND VEHICLE QUEUE ANALYSIS

A capacity analysis was performed for the study area intersections and site driveways using Synchro analysis software. The capacity analysis results of the weekday AM and PM peak hours for existing conditions and horizon year 2030 are shown in Table 7. Capacity analysis sheets and Level of Service (LOS) definitions are provided in Appendix B and Appendix C, respectively.

Capacity Analysis Thresholds:

According to the City of Barrie Traffic Impact Study Guidelines, September 2014, movements at signalized intersections operating at a volume-to-capacity (v/c) ratio greater than 0.85 are considered critical and should be identified.

The results of the capacity analysis are summarized in this section for each intersection and driveway:

Bayfield Street & Hanmer Street West

Under existing conditions, in the weekday AM and PM peak hours, the intersection operates at an overall acceptable LOS of C or better, with a delay of 17 and 21 seconds, respectively. All the movements operate at an acceptable capacity.

Under future conditions, the overall intersection is expected to operate similarly to the existing conditions and continue to experience an acceptable LOS of C or better with delays of up to 24 seconds in the peak hour.

Bayfield Street & Shoppers Access/Georgina Mall North Access

Under existing conditions, in the weekday AM and PM peak hours, the intersection operates at an overall acceptable LOS of B or better, with a delay of 8 and 14 seconds, respectively. Eastbound through and left movement operates at a LOS of E with a v/c ratio of 0.66 during weekday PM peak hour. All other movements operate at an acceptable capacity.

Signal Timing Adjustments

The signal timing of the intersection was modified to accommodate the future background traffic growth for the 2030 horizon year. The overall cycle length of the signal 150 seconds was maintained. The signal timing adjustments applied to this intersection during weekday PM Peak hour are summarized in Table 4.

Table 4 – Future Signal Timing Adjustments, Bayfield Street & Georgina Mall North Access, PM Peak Hour

Phase	Movement	Adjustments (seconds)
2	NB Through & Right	-20
4	EB Through & Right	+20
6	SB Through & Right	-20
8	WB Through & Right	+20

Under future conditions, the critical movement (eastbound through and left) at the intersection is expected to operate at an acceptable LOS of D with a v/c ratio of 0.65 during weekday PM peak hour. All other movements are expected to operate at an acceptable LOS of D or better with delays of up to 44 seconds.

Bayfield Street & East Side Marios Access/Georgian Mall South Access

Under existing conditions, in the weekday AM and PM peak hours, the intersection operates at an overall acceptable LOS of C or better, with an overall delay of 7 and 26 seconds, respectively. Eastbound through and left and westbound left movements operate at a LOS of F with a critical v/c ratio of 0.99 and 0.80 respectively during weekday PM peak hour. All other movements operate at an acceptable LOS.

Signal Timing Adjustments

The signal timing of the intersection was modified to accommodate the future background traffic growth for the 2030 horizon year. The overall cycle length of the signal was maintained. The signal timing adjustments applied to this intersection during weekday PM Peak hour are summarized in Table 5.

Table 5 – Future Signal Timing Adjustments, Bayfield Street & Georgian Mall South Access, PM Peak Hour

Phase	Movement	Adjustments (seconds)
2	NB Through & Right	-41
4	EB Through & Right	+41
6	SB Through & Right	-41
8	WB Through & Right	+41

Under future background and total conditions, the intersection is expected to operate at an acceptable overall LOS of C or better, with a v/c ratio of 0.39 and 0.75 in the weekday AM and PM peak hours, respectively. With the signal timing optimization, all the movements are expected to operate an acceptable LOS with v/c ratios up to 0.88.

Bayfield Street & Livingstone Street East

Under existing conditions, in the weekday AM and PM peak hours, the intersection operates at an overall acceptable LOS of D or better, with an overall delay of 19 and 37 seconds, respectively. Westbound left movement operates at a LOS of E with a critical v/c ratio of 0.96 during weekday PM peak hour. All other movements operate at an acceptable LOS.

Signal Timing Adjustments

The signal timing of the intersection was modified to accommodate the future background traffic growth during weekday PM hour for the 2030 horizon year. However, the overall cycle length of the signal was maintained. The signal timing adjustments applied to this intersection during the weekday PM Peak hour are summarized in Table 6.

Table 6 – Future Signal Timing Adjustments, Bayfield Street & Livingstone Street East, PM Peak Hour

Phase	Movement	Adjustments (seconds)
2	NB Through & Right	-13
3	WB Left	+7
4	EB Through & Right	+6
6	SB Through & Right	-13
7	EB Left	+2
8	WB Through & Right	+11

Under future background and total conditions, the intersection is expected to operate at an acceptable LOS of D, but with a critical v/c ratio of 0.94 in the weekday PM peak hours. The northbound through and right movement is expected to operate at a LOS of D with a critical v/c ratio of 0.98 in PM peak hour. The overall LOS during weekday AM peak hour is expected to be C, with a v/c ratio of 0.55. All other movements are expected to operate at an acceptable volume-to-capacity.

The background conditions compared to the total conditions show similar capacity results. Therefore, the proposed site is expected to have minimal impact to this intersection and is not expected to cause any excess delay.

<u>Bayfield Street & LCBO Access/Site Access</u>

Under existing conditions, in the weekday AM and PM peak hours, the intersection operates at a good LOS of B or better, with delays up to 14 seconds.

Under future conditions, the intersection is expected to operate similarly to the existing conditions. The westbound movement is expected to operate at an LOS of D with a delay of 27 seconds during PM peak hour. All the other movements are expected to operate at a acceptable LOS of C or better with minor delay. The exiting site access is to remain, and currently operates adequately, to restrict the access to a right-in/right-out only movement would not be required.

Vehicle Queues

The 95th percentile vehicle queue for the proposed access (eastbound left / right movement) is expected to be up to 68m (approximately nine to ten vehicle lengths), which is expected to be contained within the site.

Overall, no further road improvements are required to support the proposed development, aside from construction of the site access.

Table 7 - Capacity Analysis Results, Horizon Year 2030

Intersection	Existing Traffic Conditions						Background 2030 Traffic Conditions						Total 2030 Traffic Conditions					
Movement	Weekday AM Peak			Weekday PM Peak			Weekday AM Peak			Weekday PM Peak			Weekday AM Peak			Weekday PM Peak		
	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Bayfield Street & Hanmer Street W	**0.35**	**17**	**B**	**0.51**	**21**	**C**	**0.41**	**18**	**B**	**0.59**	**23**	**C**	**0.42**	**19**	**B**	**0.62**	**24**	**C**
Eastbound Left	0.14	29	C	0.18	30	C	0.16	30	C	0.21	31	C	0.15	31	C	0.21	32	C
Eastbound Through / Right	0.16	33	C	0.23	34	C	0.18	34	C	0.26	35	D	0.18	34	C	0.27	36	D
Westbound Left	0.27	26	C	0.34	24	C	0.31	26	C	0.39	25	C	0.31	25	C	0.44	25	C
Westbound Through / Right	0.14	31	C	0.19	30	C	0.15	31	C	0.21	30	C	0.14	30	C	0.21	30	C
Northbound Left	0.15	10	B	0.36	12	B	0.19	11	B	0.45	13	B	0.23	12	B	0.53	13	B
Northbound Through / Right	0.28	15	B	0.58	21	C	0.32	16	B	0.68	23	C	0.34	17	B	0.70	24	C
Southbound Left	0.30	8	A	0.49	13	B	0.36	8	A	0.61	17	B	0.39	10	A	0.61	18	B
Southbound Through / Right	0.36	14	B	0.41	18	B	0.41	14	B	0.48	20	B	0.44	16	B	0.50	21	C
Bayfield Street & LCBO Access/Site Access																		
Eastbound Through / Right		9	A		9	A		10	A		9	A		10	A		9	A
Westbound Through / Left / Right		13	B		14	B		13	B		15	C		16	C		27	D
Northbound Through		2	A		2	A		2	A		2	A		2	A		2	A
Northbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Southbound Through		2	A		1	A		2	A		2	A		4	A		4	A
Southbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Bayfield Street & Shoppers Access/Georgina Mall North Access	**0.32**	**8**	**A**	**0.41**	**14**	**B**	**0.37**	**8**	**A**	**0.50**	**14**	**B**	**0.38**	**8**	**A**	**0.52**	**14**	**B**
Eastbound Through / Left	0.24	35	C	0.65	66	E	0.26	34	C	0.65	54	D	0.26	34	C	0.65	54	D
Eastbound Right	0.03	33	C	0.06	51	D	0.04	33	C	0.07	41	D	0.04	33	C	0.07	41	D
Westbound Through / Left / Right	0.07	33	C	0.41	54	D	0.07	33	C	0.41	44	D	0.07	33	C	0.41	44	D
Northbound Left	0.16	3	A	0.27	4	A	0.22	4	A	0.37	5	A	0.22	4	A	0.38	6	A
Northbound Through / Right	0.23	5	A	0.39	8	A	0.27	6	A	0.48	10	B	0.28	6	A	0.51	10	B
Southbound Left	0.06	4	A	0.24	5	A	0.07	4	A	0.32	6	A	0.08	4	A	0.35	7	A
Southbound Through / Right	0.34	7	A	0.29	7	A	0.40	8	A	0.36	9	A	0.41	8	A	0.37	9	A
Bayfield Street & East Side Marios Access/Georgian Mall South Access	**0.33**	**7**	**A**	**0.58**	**26**	**C**	**0.38**	**8**	**A**	**0.73**	**24**	**C**	**0.39**	**8**	**A**	**0.75**	**24**	**C**
Eastbound Through / Left	0.58	39	D	0.99	106	F	0.62	40	D	0.88	55	D	0.62	40	D	0.88	55	D
Eastbound Right	0.02	31	C	0.06	45	D	0.02	31	C	0.07	27	C	0.02	31	C	0.07	27	C
Westbound Left	0.07	32	C	0.80	80	F	0.07	31	C	0.60	36	D	0.07	31	C	0.60	36	D
Westbound Through / Right	0.02	31	C	0.09	45	D	0.02	31	C	0.09	27	C	0.02	31	C	0.09	27	C
Northbound Left	0.07	3	A	0.43	10	B	0.09	4	A	0.62	18	B	0.10	4	A	0.65	20	B
Northbound Through / Right	0.21	5	A	0.42	14	B	0.24	5	A	0.60	19	B	0.25	5	A	0.63	20	B
Southbound Left	0.02	4	A	0.11	10	B	0.03	4	A	0.18	14	B	0.03	4	A	0.20	15	B
Southbound Through / Right	0.30	5	A	0.37	15	B	0.35	6	A	0.54	20	C	0.37	6	A	0.56	21	C
Bayfield Street & Livingstone Street E	**0.46**	**19**	**B**	**0.80**	**37**	**D**	**0.54**	**20**	**C**	**0.92**	**42**	**D**	**0.55**	**21**	**C**	**0.94**	**46**	**D**
Eastbound Left	0.31	24	C	0.62	41	D	0.36	24	C	0.61	38	D	0.38	24	C	0.65	39	D
Eastbound Through / Right	0.33	29	C	0.69	55	D	0.37	29	C	0.75	54	D	0.37	29	C	0.75	54	D
Westbound Left	0.44	24	C	0.96	79	E	0.51	24	C	0.89	51	D	0.51	24	C	0.89	51	D
Westbound Through / Right	0.33	28	C	0.68	54	D	0.38	29	C	0.61	46	D	0.38	29	C	0.64	47	D
Northbound Left	0.30	11	B	0.59	19	B	0.39	12	B	0.71	30	C	0.41	13	B	0.73	33	C
Northbound Through / Right	0.38	16	B	0.72	30	C	0.44	17	B	0.93	45	D	0.45	18	B	0.98	53	D
Southbound Left	0.21	11	B	0.68	33	C	0.27	12	B	0.70	35	D	0.30	12	B	0.74	40	D
Southbound Through / Right	0.49	18	B	0.52	25	C	0.57	19	B	0.69	34	C	0.59	19	B	0.71	35	C

Table 8 – Vehicle Queue Analysis Results

Intersection Movement	Available Storage (m)	95th Percentile Vehicle Queues (m) 2030 Total Traffic Conditions	
		AM Peak Hour	PM Peak Hour
Bayfield Street & LCBO Access/Site Access			
Westbound Left/Right	~30**	68	78
Southbound Left/Through	~75 Distance to upstream, adjacent access	29	53

Note: (*) Approximate distance to nearest driveway along Bayfield Street, estimated on Google Maps.

(**) Approximate distance to nearest internal point of conflict within the development, such as parking stalls or a parking aisle.

11. PARKING JUSTIFICATION STUDY

This section includes a review of the proposed parking supply and the parking requirements as per the City of Barrie Zoning By-law, as well as proxy site parking demand surveys at similar buildings to estimate the site parking demands.

11.1 Parking Requirements and Supply

A review of the parking supply provided on-site was conducted based on parking requirements provided in the City of Barrie Zoning By-law 2009-141. The proposed development includes a total parking supply of 158 auto parking spaces. The comparison of parking requirements and supply is shown in Table 9 and source information is provided in Appendix D.

Table 9 – Parking Requirements and Supply

Land Use	GFA or Capacity	Minimum Requirements		Supply
		Rate	Spaces	
Commercial Building (Building 1)	2,195.5 sq.m.	1 space per 30 sq.m.	73.2	87
Child Care (Building 1)	9 classrooms & 2 offices	1 space per classroom& 1 space per office	11	
Restaurant (Building 2)	49 persons	1 space per 4 persons	12.3	13
Mixed-use (Building 3 &4)	48 units	1.5 spaces per unit	72	50
	234 sq.m.	1 space per 30 sq.m.	7.8	8
Total			177	158

Source: City of Barrie Zoning By-law 2009-141

A total supply of 158 spaces is proposed on site, including 48 spaces for residents and 110 shared spaces for visitors and commercial customers. The Zoning By-law requirement for parking is 177 spaces, whereas the proposed parking supply is deficient by 19 spaces.

11.2 Parking Survey/Review at Proxy Sites

To better understand the commercial and residential parking demand, parking demand survey results for commercial uses and proposed parking supply at similar residential buildings were reviewed.

Commercial Uses

Trans-Plan completed a thorough review of commercial buildings in the similar vicinity with the proposed site and selected the buildings with similar characteristics for the purpose of conducting parking demand surveys. The commercial building at 531 Bayfield Street, Barrie was selected as the proxy site and was approved by the City Staff. Correspondence with the City is provided in Appendix E.

The proxy commercial building is located 150m south of the subject site, both located at the east side of Bayfield Road. The transit density and service frequency are very similar with the subject site. It is also comparable in size (approximately 2160 sq.m.) with the subject Building 1. A total parking supply of 72 spaces is provided at grade for 531 Bayfield Street.

The parking demand survey was conducted on one weekday and a Saturday (Thursday August 4,2022 and Saturday August 6, 2022). Details of the parking proxy survey conducted by Trans-Plan is as follows:

- As suggested by the city staff, conducted parking surveys during peak periods, from 10am to 8pm on Thursday and 10am to 6pm on Saturday, given that customer parking demands tend to peak during the operation hours
- Conducted spot counts of parking demand with 30-min intervals.

The survey results, showing the peak parking demand (maximum number of vehicles occupying the parking areas) are summarized in Table 10. The detailed survey results are shown in tabular form in Appendix F.

Table 10 – Peak Parking Demand Survey Results

Date	Thursday	Saturday
Units in operation	8 out of 11 (~1899 sq.m. GFA)	
Time of Peak Parking Demand	1:00pm	1:00pm
Peak Parking Demand (spaces)	49	46
Peak Parking Demand Rate for Commercial uses	0.77 spaces / 30 sq.m.	0.73 spaces / 30 sq.m.

The results of the parking demand of the proxy are summarized as follows:

- The peak parking demand for commercial parking occurred at 1pm on both Thursday and Saturday.
- The peak parking demand was 49 spaces. The average parking demand rate was observed to be 0.77 spaces per 30 sq.m.

Residential Uses

Development applications (recently approved and provided by the City staff) for similar residential buildings, located in the City of Barrie, were reviewed to compare the parking space provision of buildings to the proposed development. Development locations are summarized in Table 11.

Table 11 – Proxy Site Developments for Residential Buildings

Development	File Number	Units	Residential Parking Supply (spaces)	Parking Ratio (spaces per unit)
430 Essa Road, Barrie	D11-23-2017	67	82	1.21
440 Essa Road, Barrie	D11-027-2020	195	220	1.13
681 & 685 Yonge Street, Barrie	D11-013-2019	176	170	0.97
290-302 Georgian Drive, Barrie	D14-1673	376	450	1.20
Average Parking Ratio				**1.13**

As shown in Table 11, the average parking supply rate is 1.13 spaces per unit for the residential buildings in City of Barrie.

11.3 Estimated Parking Demands Based on Surveyed Rates

The parking demand rate was applied to estimate future parking demands for the subject site, based on the survey parking rates, as shown in Table 12.

Table 12 – Estimated Parking Demands for the Subject Site

Land Use	GFA, Units or Capacity	Estimated Parking Demand		Supply
		Rate	Spaces	
Commercial Building (Building 1)	2,195.5 sq.m.	0.77 space per 30 sq.m.	56.4	
Child Care (Building 1)	9 classrooms & 2 offices	1 space per classroom& 1 space per office	11	
Restaurant (Building 2)	49 persons	1 space per 4 persons (ZBL)	12.3	
Mixed-use (Building 3 &4)	48 units	1.13 spaces per unit	54.2	
	234 sq.m.	1 space per 30 sq.m. (ZBL)	7.8	
Total			142 (rounded up from 141.7 spaces)	158

By applying the survey results to the subject site, the expected peak parking demand rate for commercial uses (Building 1) would be 0.77 spaces per 30 sq.m., and the parking demand for residential uses would be 1.13 spaces per unit. The total demands of 142 spaces could be accommodated by the proposed parking supply of 158 spaces resulting in a potential surplus of 16 spaces. The remaining parking spaces

could be allocated to uses at the site, as needed.

12. TRANSPORTATION DEMAND MANAGEMENT

A discussion of Transportation Demand Management (TDM) is provided as part of this study in an effort to minimize traffic congestion, improve air quality, reduce greenhouse gas emissions, and improve public health in the long-term. This TDM plan discusses existing and future infrastructure, and a variety of strategies to reduce traffic congestion to minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system.

Transit

Increasing public transit use has many benefits such as protecting the environment, reducing traffic congestion on major roads, providing convenience, saving energy, strengthening communities, and improving liveability.

The site is currently well served by transit with multiple frequent local routes operating within close (i.e., within a two-minute walk) to the site. Several bus routes in the area operate between the site and the two GO Stations in Barrie, which provide further connections to other municipalities in GTA. A summary of the transit connection characteristics is provided in Table 2. Figure 5 contains a map of the area surrounding the site detailing the active transit connections.

To introduce residents at the site to travel by transit, the developer is encouraged to provide tenants with packages containing Transit route maps, schedules, and pre-purchased monthly transit passes to tenants to promote utilizing transit, and other useful information on how to reduce the dependence on single occupancy vehicles.

Cycling

Employees, residents and visitors to the site should be encouraged to utilize cycling as a means of transportation and recreation. Aside from reducing automobile trips, thereby reducing air pollution and traffic congestion, cycling can also provide public health benefits and better allow future occupants of the site to familiarize themselves their surrounding area. Bicycle storage within the building is recommended for employees. Cycling trips to and from the site should be further encouraged by distributing maps of local cycling routes and trails. There are bicycle racks located outside of the existing ‘building 2’ which can be accessed by visitors to the site consisting of a total of 4 spaces as well as a bicycle rack located in the proposed ‘Building 4’ which will also provide 4 spaces to residents or visitors.

Walking

Multi-use pathway facilities are encouraged as both a means of travel and recreation. Sidewalks and off-road pathways are intended to be integrated into a continuous pedestrian system that includes local roads, arterial roads, collector roads and off-road pathways. Connecting pedestrian systems to major roadways such as Bayfield encourages a healthier and more environmentally friendly lifestyle. Sidewalks are currently provided along both sides of Bayfield Street, Hanmer Street and Livingstone Street. The proposed redevelopment connects to the sidewalks on Bayfield Street.

Carpooling / Ridesharing

To help reduce travel by single-occupant automobiles, staff and visitors should be encouraged to carpool where possible. Smart Commute is one of a network of local transportation management associations across the GTA-Hamilton delivering TDM programs and services.

Ridesharing allows people without a vehicle to share a vehicle with others to their specified location. Uber was one of the first to start the ridesharing movement within the GTA. The ease of use with the smartphone application (app) is popular with young professionals and students who may look for other options than owning a personal vehicle for travel.

Communication Strategy

To further encourage TDM measures, the topic should be brought up in public meetings to increase tenants' awareness of trip making options. New tenants would receive an occupancy package from the developer, that contains information on TDM, including:

- Transit route maps and schedules
- Providing a monthly transit pass
- Cycling routes and pedestrian trails map
- List of nearby amenities, services, retail shops and restaurants in the local area

13. TRAFFIC CONTROL AND SIGNAGE PLAN

A signage and pavement marking plan has been prepared for the subject site and can be found in Figure 9. A full-size (24" x 36") has been provided separately as well, for submission. Pavement markings proposed at the site include stop bars to be located at the internal intersection where the drive aisles within the parking area. The type and general placement of signs is based on the Ontario Traffic Manual, Book 5, Regulatory Signs. The following signs and their general placement on the site are summarized as follows:

- Fire Route Signs (FR) are proposed approximately every 30m along the designated fire route of the site
- Disabled Parking Permit Signs (Rb-93) are proposed at the barrier free spaces for both visitor parking lots.
- Stop Signs (Ra-1) are located at all the internal intersections at the ends of the drive aisles.
- All the parking stall and loading spaces are proposed to be marked with 10cm wide white pavement markings.
- Loading Zone Signs (LZ) are located at the designated loading area.
- Pick-up/Drop-off Only Sign (DO) is located at the designated drop-off area.

14. CONSTRUCTION MANAGEMENT PLAN

14.1 General Guidelines

The contractor will be required to develop a traffic control plan which will include the following details:

- Vehicle access points and movements permitted at these access points
- Truck routing
- Material loading and unloading zones
- Temporary condition signage and barriers

The traffic control plan(s) will adhere to the Ontario Traffic Manual, Book 7, Temporary Conditions. The Owner is responsible for the manufacture and the erection of all signs and delineators noted in the Traffic Management Plan.

General construction work hours will be in accordance with the City of Barrie Noise By-law 2006-140. The operation of any equipment in connection with construction is limited to the hours from 7:00 a.m. to 7:00 p.m., Monday through Saturday. The existing buildings in operation will have their operating areas be maintained and accessible at all times.

14.2 Proposed Mitigation Measures

The following describes how construction activities will be managed and how the impacts of construction activities on the community will be minimized during the project:

Construction Access:

The construction accesses are located at the existing accesses to the site of Bayfield Street, approximately 200m south of Hanmer Street. The access is proposed to be both for truck and passenger vehicles.

Truck Traffic:

Truck (construction traffic) will only be permitted to travel along the proper designated routes. Trucks are expected to use the site access located on Bayfield Street to access the site. Inbound and outbound construction vehicles are expected to utilize the roadways Bayfield Street as Highway 400 is easily accessible via Bayfield Street. There are currently no weight restrictions along Bayfield Street in the City of Barrie. The proposed truck routing is shown in Figure 10.

14.3 Construction Management Plan

A Construction Management Plan (CMP) is required prior to the execution of construction work. Figure 11 shows the conceptual layout (to be confirmed by the Contractor), showing the hoarding (temporary fencing) location, silt fence location, mud mat location, construction trailer, parking area and the unloading and storage area for construction materials. The access would operate as the main access for construction vehicles and any deliveries or unloading required.

15. SITE PLAN REVIEW

15.1 Left Turn Lane Warrant

A left turn lane warrant was completed for the southbound approach (southbound left turn) at Bayfield Street and the site access. The traffic volumes used for the analysis were the weekday AM and PM peak hour volumes, under existing (year 2023), future background and future total traffic conditions (year 2030). The City of Barrie Transportation Engineering Staff requested a design speed of 80km/hr however

that speed would have only been applicable on the use of a two-lane road, since the site is based on a four-lane road the nomograph from the MTO Geometric Design guidelines was utilized.

The warrants from the MTO Geometric Design Guidelines were analyzed for a "Four-Lane Undivided Highways Unsignalized" condition (see Appendix G for the MTO warrant charts). The results are shown in Table 13.

Table 13 – Left Turn Warrant Review, Bayfield Street at Site Access, Southbound Direction

Criteria	Weekday AM Peak Hour Traffic Volumes	Weekday PM Peak Hour Traffic Volumes
Existing Traffic Conditions – Southbound Left Turn onto Site Access		
Left Turn Traffic Volumes (SBLT)	48	22
v_A – Advancing Traffic Volumes	696	762
v_O – Opposing Traffic Volumes	456	955
% Left Turns in Advancing Traffic Volumes (v_A)	~7%	~3%
Warrant justified?	Yes	No
Future 2030 Background Traffic Conditions – Southbound Left Turn onto Site Access		
Left Turn Traffic Volumes (SBLT) v_A – Advancing Traffic Volumes v_O – Opposing Traffic Volumes	55 1023 604	25 1084 1407
% Left Turns in Advancing Traffic Volumes (v_A)	~5%	~2%
Warrant justified?	Yes	No
Future 2030 Total Traffic Conditions – Southbound Left Turn onto Site Access		
Left Turn Traffic Volumes (SBLT) v_A – Advancing Traffic Volumes v_O – Opposing Traffic Volumes	96 1023 604	59 1084 1407
% Left Turns in Advancing Traffic Volumes (v_A)	~9%*	~5%*
Warrant justified?	Yes	Yes

Source: MTO Geometric Design, Figure EB-1

Note: (*) Warrant for left turn volumes less than ~5% of advancing volumes is unavailable

The results indicate that a southbound left turn lane would be warranted along Bayfield Street under existing, future 2030 background and total 2030 conditions, in the weekday AM or PM peak hours.

The existing roadway characteristics on Bayfield Street already includes a center left turn lane for vehicles to make a left into the existing site and other adjacent site accesses along Bayfield Street. No pavement marking adjustments are required for the left turn lane.

15.2 Right Turn Lane Warrant Review

MTO Requirements

A right turn lane warrant analysis for the existing and future 2030 horizon year was reviewed for the intersection of Bayfield Street at the Site Access. A right turn lane is generally warranted upon meeting

the following criteria, taken from the MTO Geometric Design Standards for Ontario Highways (See Appendix G):

- Right turning traffic volumes for the design hour is 60 vehicles per hour or more,
- Property is readily available, and,
- The terminal points of the deceleration / acceleration lanes do not conflict with any adjacent commercial development

A summarized table for the intersection of Bayfield Street at the Site Access is provided in Table 14.

Table 14 – Right Turn Lane Warrant Justification, Bayfield Street at Site Access, Northbound Direction

Criteria	Weekday AM Peak Hour Traffic Volumes	Weekday PM Peak Hour Traffic Volumes
Existing Traffic Conditions – Northbound Right Turn onto Site Access		
Northbound Right	60	44
Warrant justified?	Yes	No
Future 2030 Background Traffic Conditions – Northbound Right Turn onto Site Access		
Northbound Right	76	62
Warrant justified?	Yes	Yes
Future 2030 Total Traffic Conditions – Northbound Right Turn onto Site Access		
Northbound Right	117	140
Warrant justified?	Yes	Yes

The northbound right turning traffic volumes into the proposed redevelopment are generally more than the 60 vehicle per hour warrant threshold, and warrants a right turn lane. However, based on the capacity analysis results, the northbound right turn movement is expected to operate at a good LOS of A with minimal delays under future conditions. The northbound right movement could operate without a right turn lane due to the minimal delays. The analysis for the 2030 horizon period with the proposed roadway improvements are discussed in Section 10. In addition, providing a right turn lane along Bayfield Street for the site access would conflict with adjacent commercial site accesses, which is not recommended as per the guidelines.

15.3 Site Circulation Review

A site circulation review was completed using AutoTurn vehicle turning template software to simulate design vehicles expected to use the site, including a loading vehicle (MSU and LSU for moving, delivery, etc.), a waste collection vehicle, a fire truck and a passenger vehicle. Details of the site circulation review for each vehicle type is provided in this section:

<u>Loading Vehicles</u>

Figure 12 and Figure 13 show a Medium Sing-Unit (MSU) vehicle accessing the driveway off Bayfield Street and parking into the loading area next to Building 1 and exiting the site from the same access. Figure 14

and Figure 15 show a Light Single-Unit (LSU) vehicle accessing the driveway off Bayfield Street and parking into the loading area and the drop-off area next to Building 3 and exiting the site from the same access.

Waste Collection Vehicles

Figure 16 and Figure 17 demonstrate that a typical 12m waste collection vehicle is able to access and exit from the loading space and site adequately.

Fire Truck

Figure 18 and Figure 19 show a fire truck accessing the site via the driveway off Bayfield Street, driving along the designated fire route, and then exiting via the same access.

Passenger Vehicles

Figure 20 and Figure 21 show a passenger vehicle accessing the site and park at the drop-off area and the most critical parking spaces, and then exiting via the same access. Figure 22 shows a passenger vehicle entering the at-grade parking level and parking in critical spaces and existing the critical spaces.

Overall, the figures indicated that the proposed site plan layout is adequate for the circulation of passenger vehicles, loading vehicles, and waste collection vehicles. Vehicles larger than a 12m waste collection truck are not expected to enter the site.

16. SUMMARY AND RECOMMENDATIONS

Our Transportation Study for the proposed mixed-use development, located at 535 Bayfield Street, in the City of Barrie, are summarized as follows:

Traffic Impact Study

- The existing commercial one-storey building located on the north side will remain the same with a GFA of 2,954.50 sqm inclusive of a Day Care Centre with a proposed GFA of 759 sqm. The existing Tim Hortons is proposed to also remain the same. Two new four-storey mixed-use buildings are proposed with a total of 48 units and 234 sq.m. ground floor retail area. The site plan includes a total of 158 surface parking spaces.
- The traffic counts for the study area intersections were obtained by Trans-Plan by conducting intersection turning movement counts for all the weekday AM and PM peak hours, the Counts were adjusted to the present year 2023 with a 2% growth rate year over year.
- An annual growth rate of 2.0% was applied to the major study area roadways during all the horizon years of this study.
- The subject site is expected to generate 148 and 233 two-way trips in the weekday AM and PM peak hours, respectively.
- The existing full-moves access at Bayfield Street is expected to accommodate the site trips generated by the proposed redevelopment. Site trips are not expected to cause any additional significant impacts at the intersection. The site accesses are expected to operate acceptably, with a LOS of C or better during the weekday peak hours.

- The vehicle queues exiting all the site accesses are expected to be contained within the site. No further road improvements are required to support the proposed development.
- With the adjustments of signal timing plan for weekday PM peak hour, the signalized intersections, Bayfield Street & Shoppers Access/Georgina Mall North Access, Bayfield Street at Georgian Mall South access and Bayfield Street at Livingstone Street East, are expected to operate acceptably overall, with a LOS of D. All the individual movements are expected to operate acceptably.

Parking Justification Study

- A total supply of 158 spaces is proposed on site, including 48 spaces for residents and 110 shared spaces for visitors and commercial customers. The Zoning By-law requirement for parking is 177 spaces, whereas the proposed parking supply is deficient by 19 spaces.
- A proxy parking survey was conducted at the commercial building at 531 Bayfield Street, Barrie. The results of the parking demand was observed to be 49 spaces. The average parking demand rate was observed to be 0.77 spaces per 30 sq.m.
- Development applications for similar residential buildings, located in the City of Barrie, were reviewed to compare the parking space provision of buildings to the proposed development. The average parking supply rate is 1.13 spaces per unit for the residential buildings in City of Barrie.
- By applying the survey results to the subject site, the expected peak parking demand would be 142 spaces, which could be accommodated by the proposed parking supply of 158 spaces resulting in a potential surplus of 16 spaces.

TDM Plan

- Pedestrian connections are provided on-site to connect residents, visitors and customers to the municipal sidewalk along Bayfield Street. Transit stops are provided within a walking distance from the site, and the site is therefore adequately serviced by transit. Pre-loaded monthly transit passes are recommended to be provided for the residents to promote reduction of single occupancy vehicles.
- The applicant would distribute transit service schedules / maps, cycling routes / pedestrian trails maps and a list / description of available community services in the area to new tenants as part of a welcome package.

Traffic Signage and Pavement Marking Plan

- A signage and pavement marking plan has been provided for the subject site, depicting locations of various signs including stop signs, fire route signs and barrier free signs. Stop The type and general placement of signs is based on the City's Site Plan and the Manual OTM Manual, Book 5, Regulatory Signs.

Construction Management Plan

- Construction activities are to be conducted between the hours of 7:00 a.m. to 7:00 p.m., Monday to Saturday, in accordance with the City's Noise By-law.
- A construction management plan, conceptual drawing, is provided showing the layout of the on-site construction operations.

Site Plan Review

- A left and right turn lane warrant was conducted at Bayfield Street and the Site Access using MTO geometric design guidelines, they were warranted, however are expected to not be implemented since the site operates acceptably.
- The vehicle turning templates show that the proposed driveway and internal drive aisles can accommodate waste collection, loading / delivery, fire trucks and passenger vehicles. Vehicles larger than a waste collection vehicle are not expected at the site.

In conclusion, the proposed development can be accommodated without any further road improvements.

Respectfully submitted,

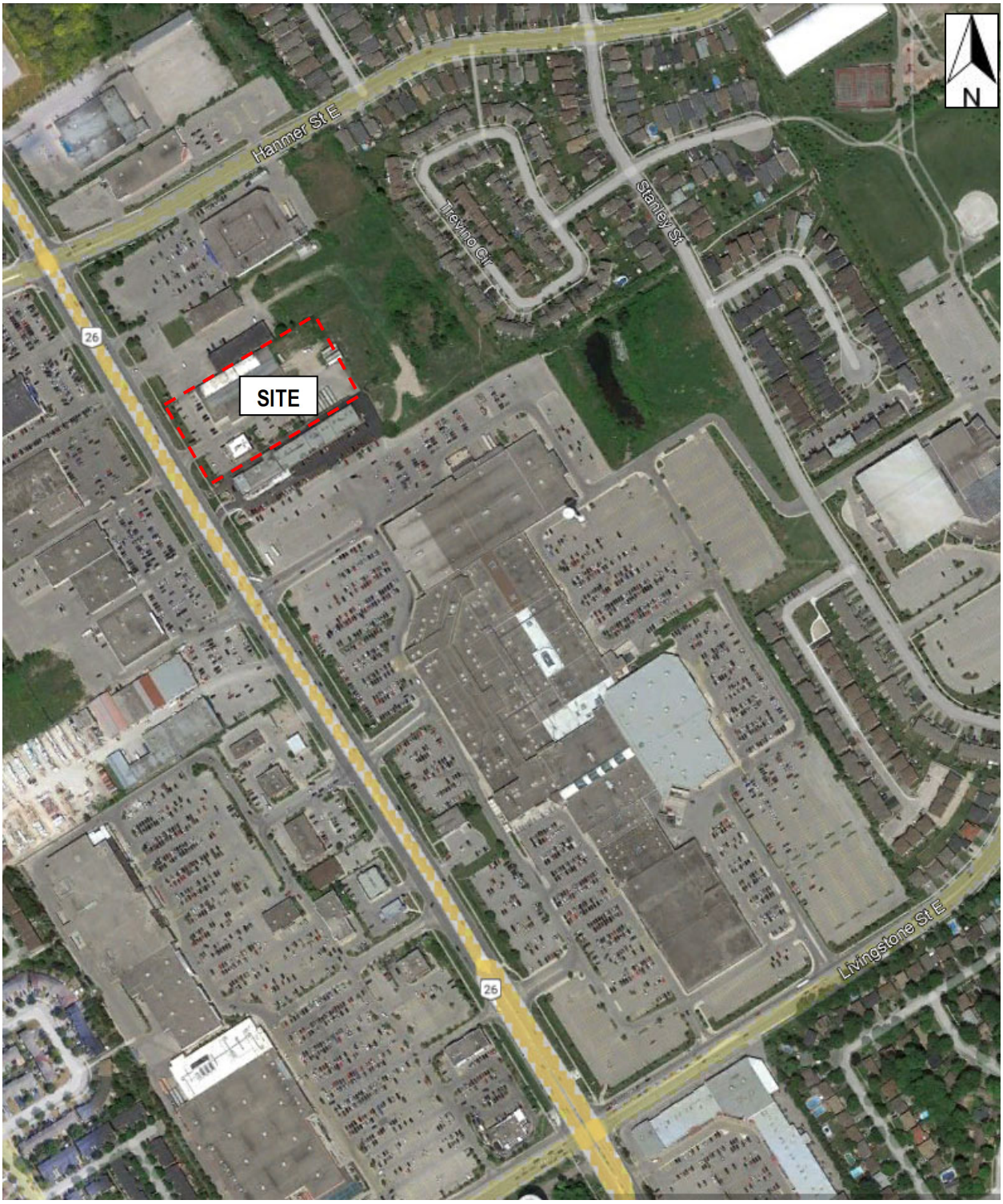
Anil Seegobin, P.Eng.
Partner, Engineer

Jing Min, E.I.T.
Traffic Analyst

Trans-Plan Transportation Inc.

Transportation Consultants

Figure 1 – Site Location



Source: Google Earth

Figure 2 - Site Plan

ONTARIO BUILDING CODE DATA

1 **PROJECT DESCRIPTION:** — DIV. B PART 3
NEW MIXED USE BUILDING
BUILDING HEIGHT = 17.20 M (5 STOREYS)

2 **MAJOR OCCUPANCY:** — B 3.1.2.1(1)
RESIDENTIAL - GROUP C

3 **BUILDING AREA:** — A 1.4.1.2
EXISTING (0.0) + NEW (1,596.20) = TOTAL 1,596.20 SQ.M.

4 **GROSS AREA:** — A 1.4.1.2
EXISTING (0.0) + NEW (6,295.20) = TOTAL 6,295.20 SQ.M.

5 **NUMBER OF STOREYS:** — B 3.2.1.1 & A 1.4.1.2
ABOVE GRADE = 4 STOREYS, BELOW GRADE = 0 STOREYS

6 **NUMBER OF STREETS / FIRE FIGHTER ACCESS:** — B 3.2.2.10 & B 3.2.5
FACING 1 STREET

7 **BUILDING CLASSIFICATION:** — B 3.2.2.20 - B 3.2.2.83
3.2.2.43A, GROUP C, UP TO 6 STOREYS, SPRINKLERED

8 **SPRINKLER SYSTEM PROPOSED:** — B 3.2.2.43 & B 3.2.1.5
FULLY SPRINKLERED

9 **STANDPIPE REQUIRED:** — B 3.2.9
YES

10 **FIRE ALARM REQUIRED:** — B 3.2.4
YES

11 **WATER SERVICE / SUPPLY IS ADEQUATE:** — B 3.2.5.7
YES

12 **HIGH BUILDING:** — B 3.2.6
NO

13 **PERMITTED CONSTRUCTION:** — B 3.2.2.20 - B 3.2.2.83
COMBUSTIBLE OR NON-COMBUSTIBLE
ACTUAL CONSTRUCTION:
COMBUSTIBLE AND NON-COMBUSTIBLE

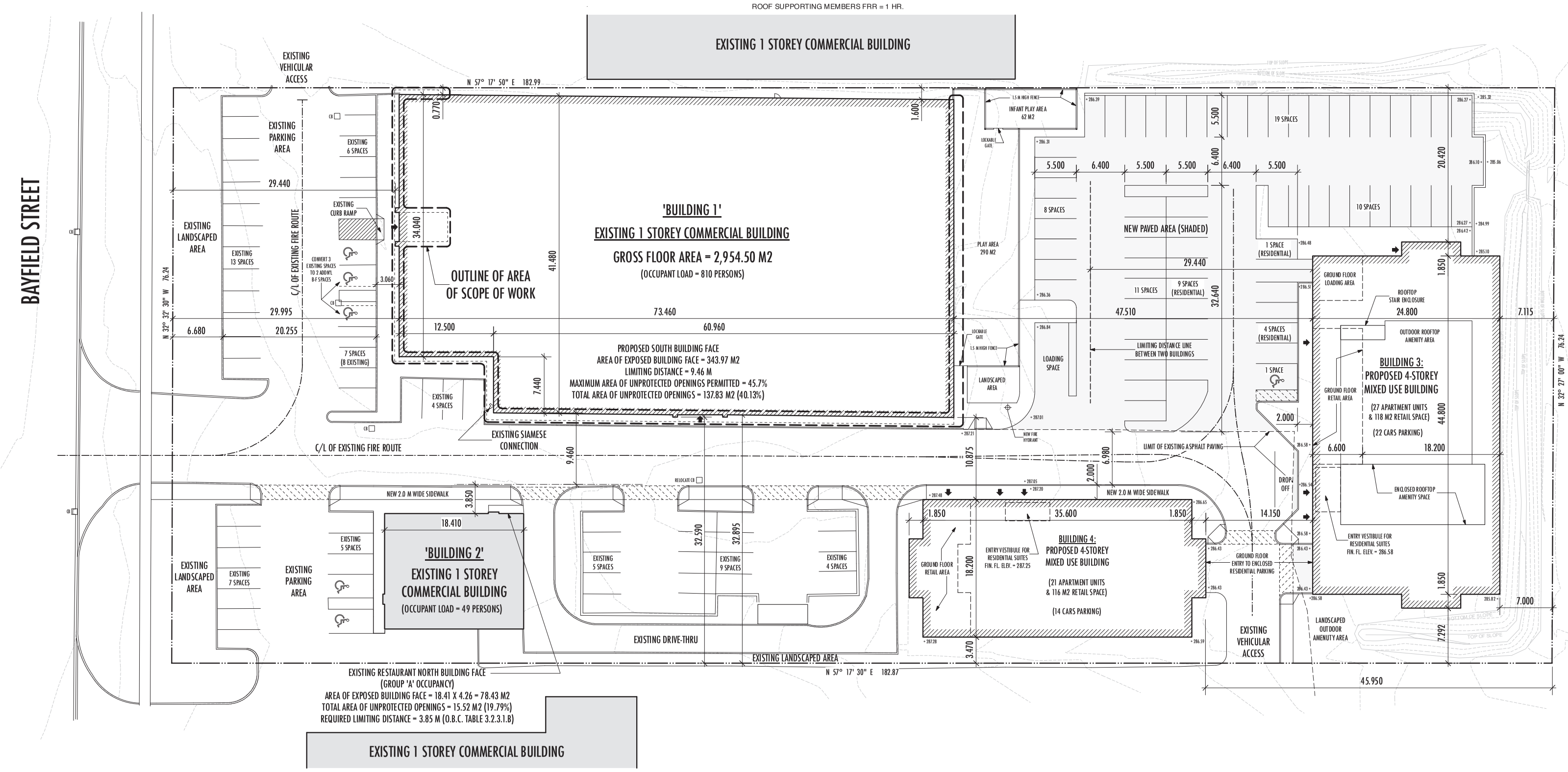
14 **MEZZANINE AREA(S):** — B 3.2.1.1(3) - B 3.2.1.1(8)
TOTAL = 0 SQ.M.

15 **OCCUPANT LOAD:** — B 3.1.16
GROUND FLOOR (E): 250 M2 / 3.7 = 68 PERSONS
GROUND FLOOR (F3): 1,086 M2 / 46 = 24 PERSONS
SECOND FLOOR (C): 2 / BEDROOM = 52 PERSONS
THIRD FLOOR (C): 2 / BEDROOM = 52 PERSONS
FOURTH FLOOR (C): 2 / BEDROOM = 52 PERSONS
ROOF (A2): 91 M2 / 1.85 = 50 PERSONS
TOTAL = 298 PERSONS

16 **BARRIER FREE DESIGN:** — B 3.8
YES

17 **HAZARDOUS SUBSTANCES:** — B 3.3.1.2 & B 3.3.1.19
NO

18 **REQUIRED FIRE-RESISTANCE RATINGS:** — B 3.2.2.43 & B 3.2.1.4
SECOND FLOOR ASSEMBLY FRR = 2 HR.
THIRD & FOURTH FLOOR ASSEMBLIES FRR = 1 HR.
ROOF ASSEMBLY FRR = 1 HR.
SECOND FLOOR SUPPORTING MEMBERS FRR = 2 HR.
FLOOR SUPPORTING MEMBERS FRR = 1 HR.
ROOF SUPPORTING MEMBERS FRR = 1 HR.

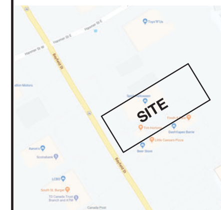


SITE STATISTICS:

	REQUIRED	EXISTING	PROPOSED
OFFICIAL PLAN DESIGNATION:		GENERAL COMMERCIAL	GENERAL COMMERCIAL
ZONING CATEGORY:		GENERAL COMMERCIAL (C4)	GENERAL COMMERCIAL (C4)
ZONING USE:		RETAIL STORE	SHOPPING CENTRE
LOT AREA:	450 M2	13,935.46 M2	13,935.46 M2
LOT FRONTAGE:	15.0 M (MIN.)	76.20 M	76.20 M
BUILDING AREA:		3,236.70 M2	5,053.40 M2
BUILDING 1:		2,954.50 M2	2,954.50 M2
BUILDING 2:		282.20 M2	282.20 M2
BUILDING 3:		0.00 M2	1,139.90 M2
BUILDING 4:		0.00 M2	676.80 M2
LOT COVERAGE:	50% (MAX.)	23.3%	36.3%
BUILDING DENSITY:		2,322.64 M2/HA	7,479.47 M2/HA
GROSS FLOOR AREA:		3,236.70 M2	10,436.10 M2
BUILDING 1:		2,954.50 M2	2,954.50 M2
BUILDING 2:		282.20 M2	282.20 M2
BUILDING 3:		0.00 M2	4,539.60 M2
BUILDING 4:		0.00 M2	2,659.80 M2
FLOOR SPACE INDEX:		0.23	0.74
BUILDING HEIGHTS:	14.0 M (MAX.)		
BUILDING 1:		7.2 M	7.2 M
BUILDING 2:		1 STOREY	1 STOREY
BUILDING 3:			17.2 M
BUILDING 4:			17.2 M

	REQUIRED	EXISTING	PROPOSED
BUILDING 3 SETBACKS:			
FRONT:	6.0 M (MIN.)	N/A	29.440 M
REAR:	7.0 M (MIN.)	N/A	7.000 M
NORTH SIDE:	3.0 M (MIN.)	N/A	20.420 M
SOUTH SIDE:	3.0 M (MIN.)	N/A	7.292 M
BUILDING 4 SETBACKS:			
FRONT:	6.0 M (MIN.)	N/A	25.500 M
REAR:	7.0 M (MIN.)	N/A	45.950 M
NORTH SIDE:	3.0 M (MIN.)	N/A	54.500 M
SOUTH SIDE:	3.0 M (MIN.)	N/A	3.470 M
PARKING AREA:		4,620.86 M2	6,691.56 M2
BUILDINGS 1, 3 & 4:		3,792.17 M2	5,862.87 M2
BUILDING 2:		828.69 M2	828.69 M2
PARKING REQUIRED:		112 SPACES	192 SPACES
BUILDING 1:	2,954.5 M2 @ 1 PER 30 M2	99 SPACES	99 SPACES
BUILDING 2:	1 PER 4 PERSONS	13 SPACES	13 SPACES
BUILDINGS 3&4 (RETAIL):	234 M2 @ 1 PER 30 M2		8 SPACES
BUILDINGS 3&4 (APTMNT.):	48 @ 1.5 PER UNIT		72 SPACES
PARKING PROVIDED:		104 SPACES	158 SPACES
BUILDING 1:		91 SPACES	87 SPACES
BUILDING 2:		13 SPACES	13 SPACES
BUILDINGS 3&4 (RETAIL):			8 SPACES
BUILDINGS 3&4 (APTMNT.):			50 SPACES

NOTE:
INFORMATION ON THIS SITE PLAN TAKEN FROM:
PLAN OF SURVEY OF
PART OF LOT 18, CONCESSION 4
GEOGRAPHIC TOWNSHIP OF VESPRA
NOW IN THE CITY OF BARRIE
COUNTY OF SIMCOE
BY: J.D. BARNES LIMITED
MARCH 29, 2021



Key Plan

Issue	Date	Description	By
01	JUN 11/19	OWNER REVIEW	J.M.
02	AUG 21/19	OWNER REVIEW	J.M.
03	OCT 18/19	OWNER REVIEW	J.M.
04	JUL 21/20	OWNER REVIEW	J.M.
05	NOV 25/20	OWNER REVIEW	J.M.
06	APR 21/21	OWNER REVIEW	J.M.
07	SEP 24/21	OWNER REVIEW	J.M.
08	MAR 29/22	OWNER REVIEW & CONSULTATION	J.M.
09	JUL 13/22	REVIEW & CONSULTATION	J.M.
10	OCT 27/22	COORDINATION	J.M.
11	JAN 06/23	COORDINATION	J.M.

Rev.	Date	Description	By
01	N/A	N/A	J.M.

ARCHITECT'S INSTRUCTIONS:

THE CONTRACTOR MUST CHECK AND VERIFY ALL DRAWING DIMENSIONS ON THE SITE BEFORE AND DURING CONSTRUCTION, AND REPORT TO THE ARCHITECT ANY DISCREPANCIES PRIOR TO COMMENCING WORK.

DRAWINGS ARE NOT TO BE SCALED FOR PURPOSES OF CONSTRUCTION.

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keith loffler mcalpine architects

klma — A PARTNERSHIP OF CORPORATIONS

ONTARIO ASSOCIATION OF ARCHITECTS — JOHN WILLIAM McALPINE — LICENCE

COORDINATION
JANUARY 06, 2023 — Scale: 1 : 300
Project no. 1935 — Drawn by J.M. — Checked by J.M.

Mixed Use Buildings
Buildings 3 & 4

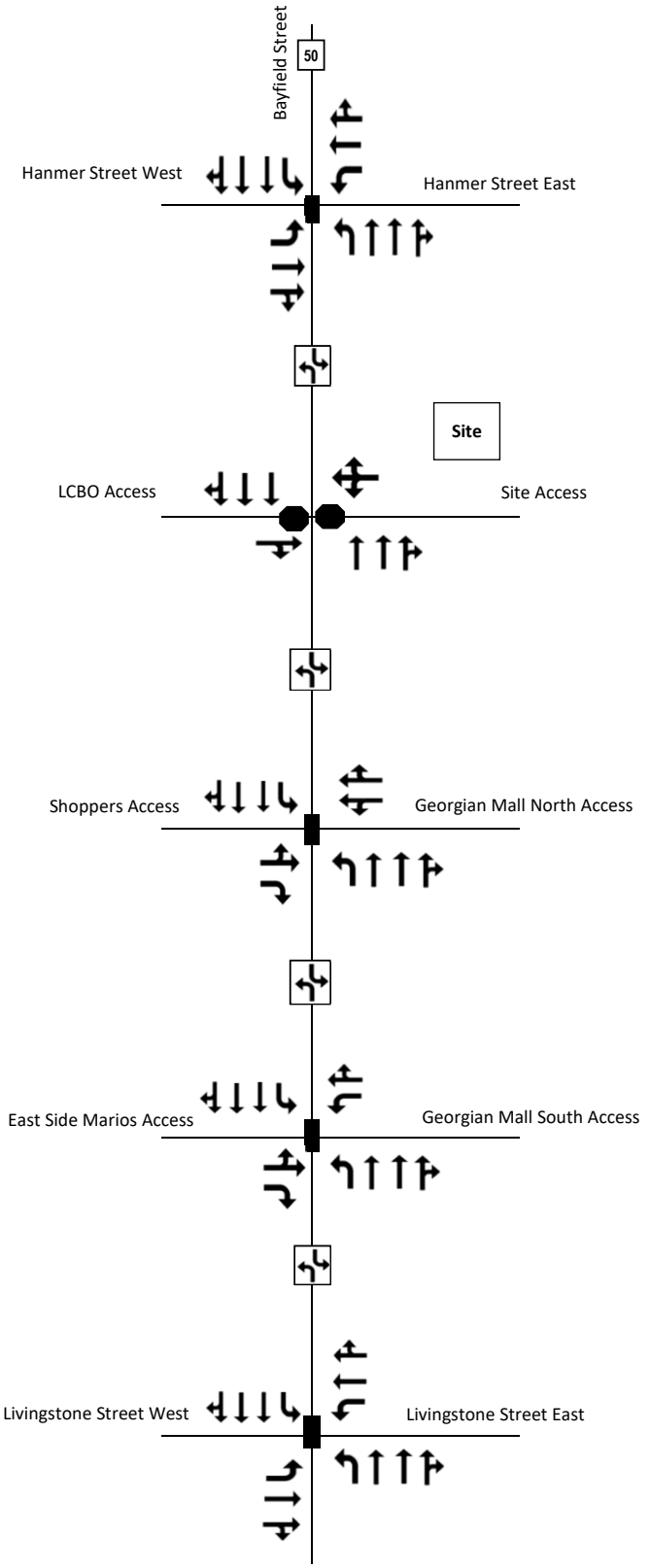
535 Bayfield Street, Barrie, Ontario

OWNER: Petro Gold Ltd.

Architectural Site Plan

A001

Figure 3: Existing Roadway Characteristics



LEGEND

- Traffic Signal
- Stop Sign
- 60 — Posted Speed Limit (km/h)
- Two-Way Centre Left Turn Lane
- Lane Configuration

Schematic; Not To Scale

Figure 4: Existing Traffic Volumes, Weekday AM & PM Peak Hours

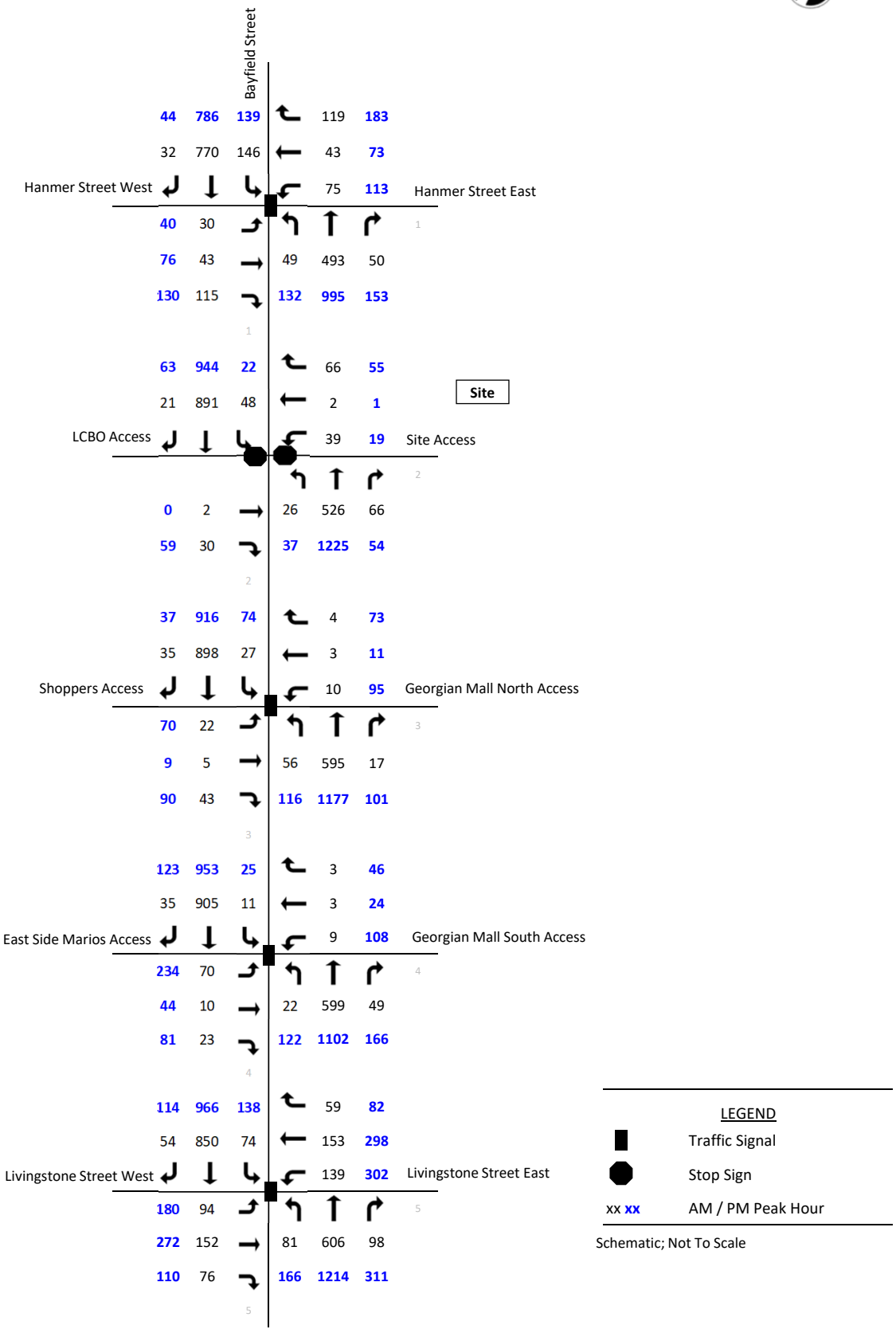
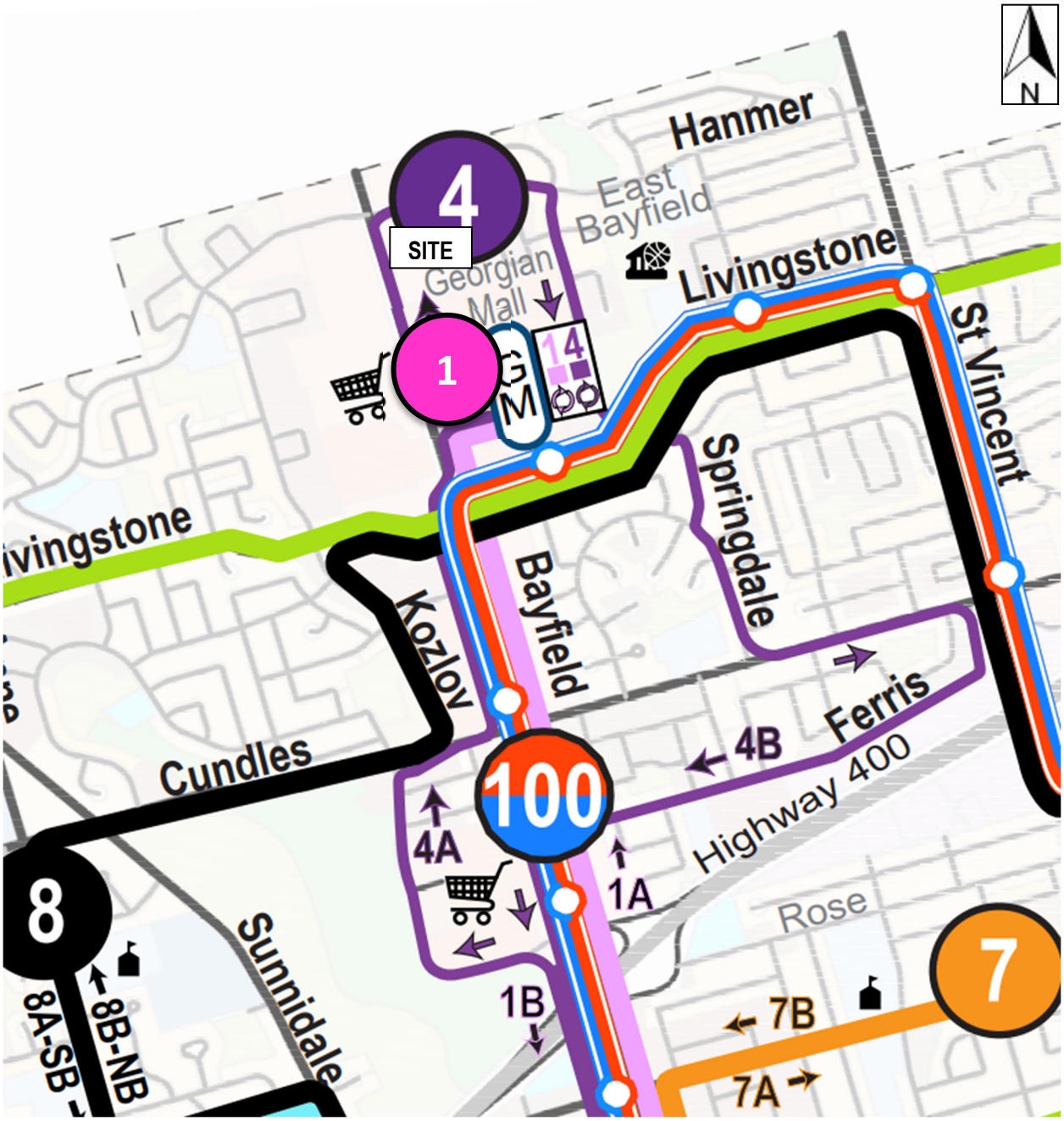


Figure 5 – Study Area Transit Service



Source: City of Barrie Transit System Map

Figure 6: 2030 Background Traffic Volumes, Weekday AM & PM Peak Hours

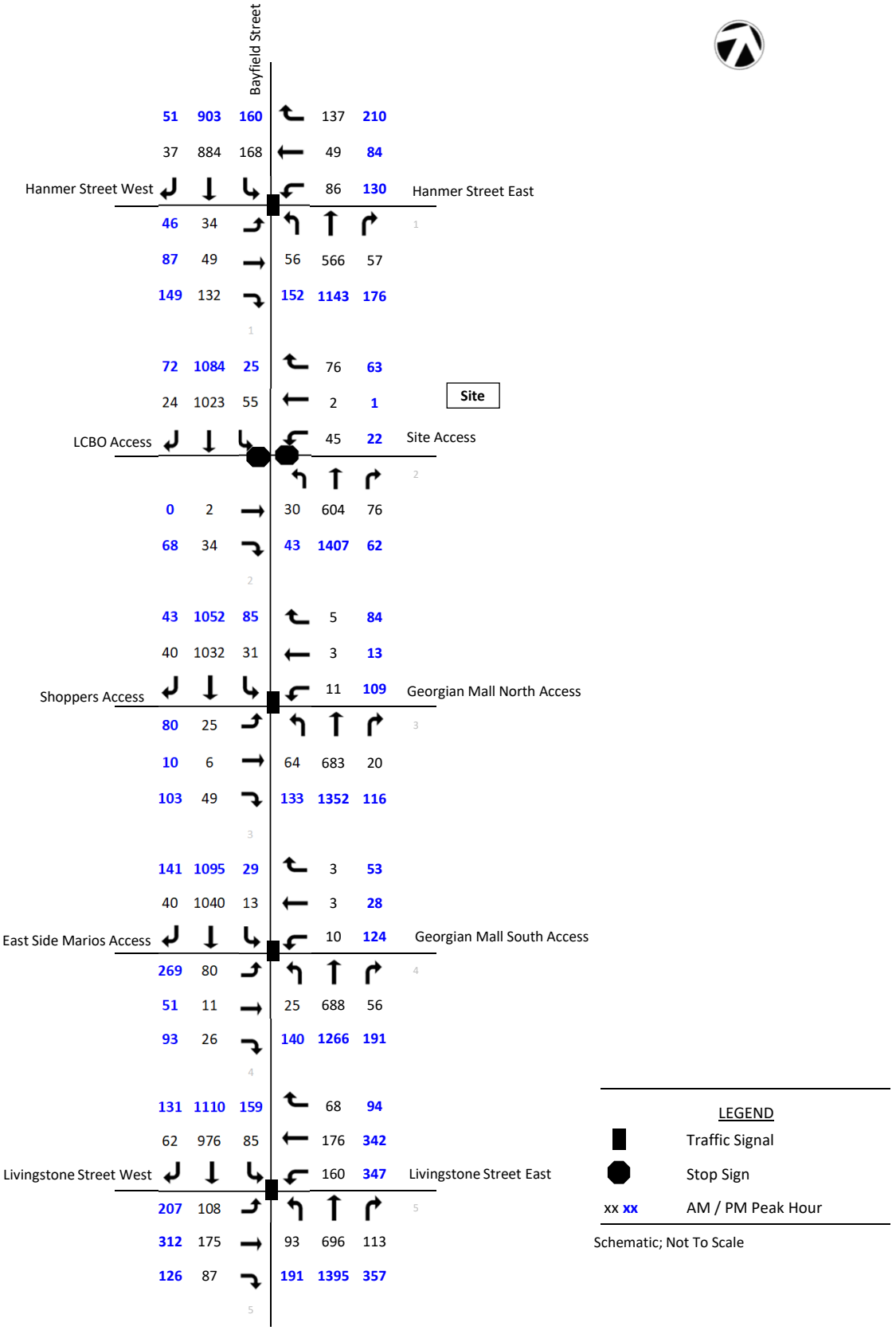
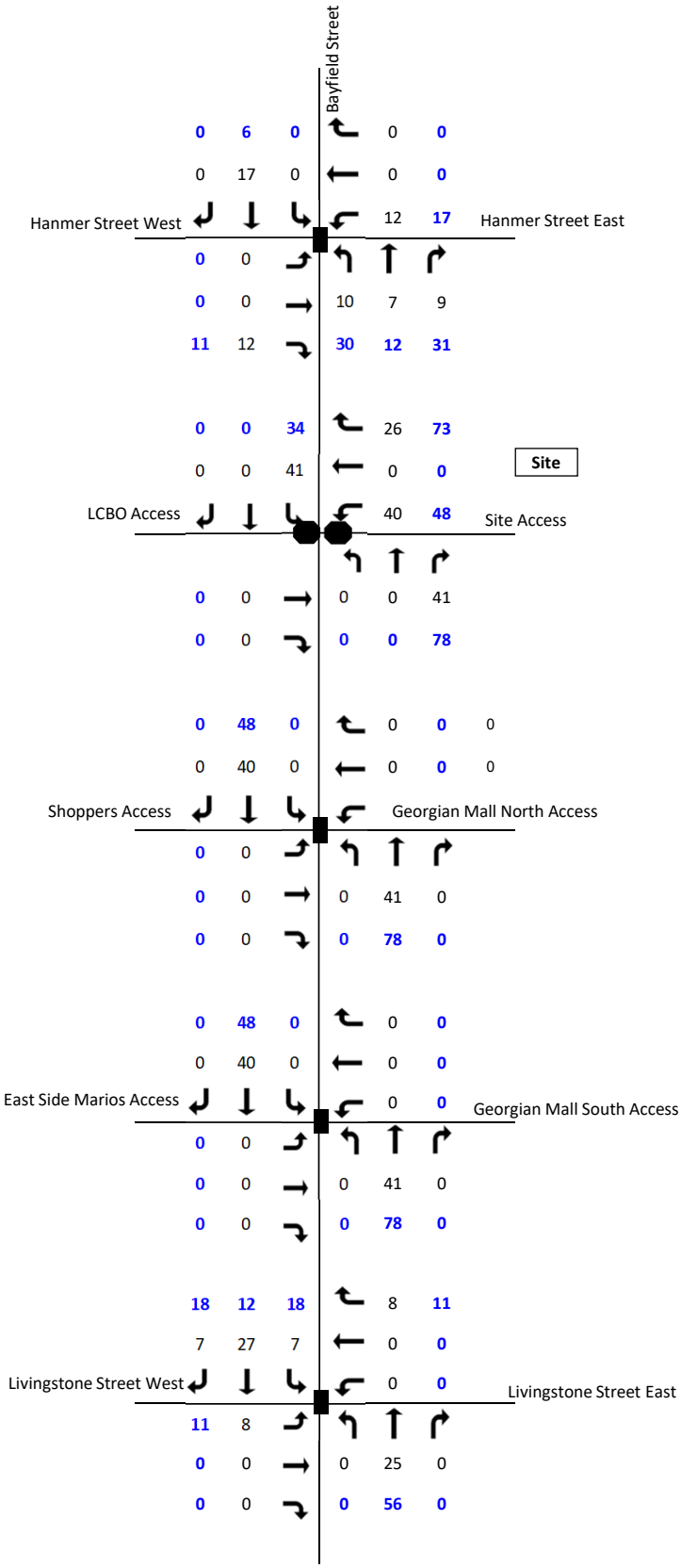


Figure 7: Site Traffic Assignment, Weekday AM and PM Hours



Schematic; Not To Scale

Figure 8: 2030 Total Traffic Volumes, Weekday AM & PM Peak Hours

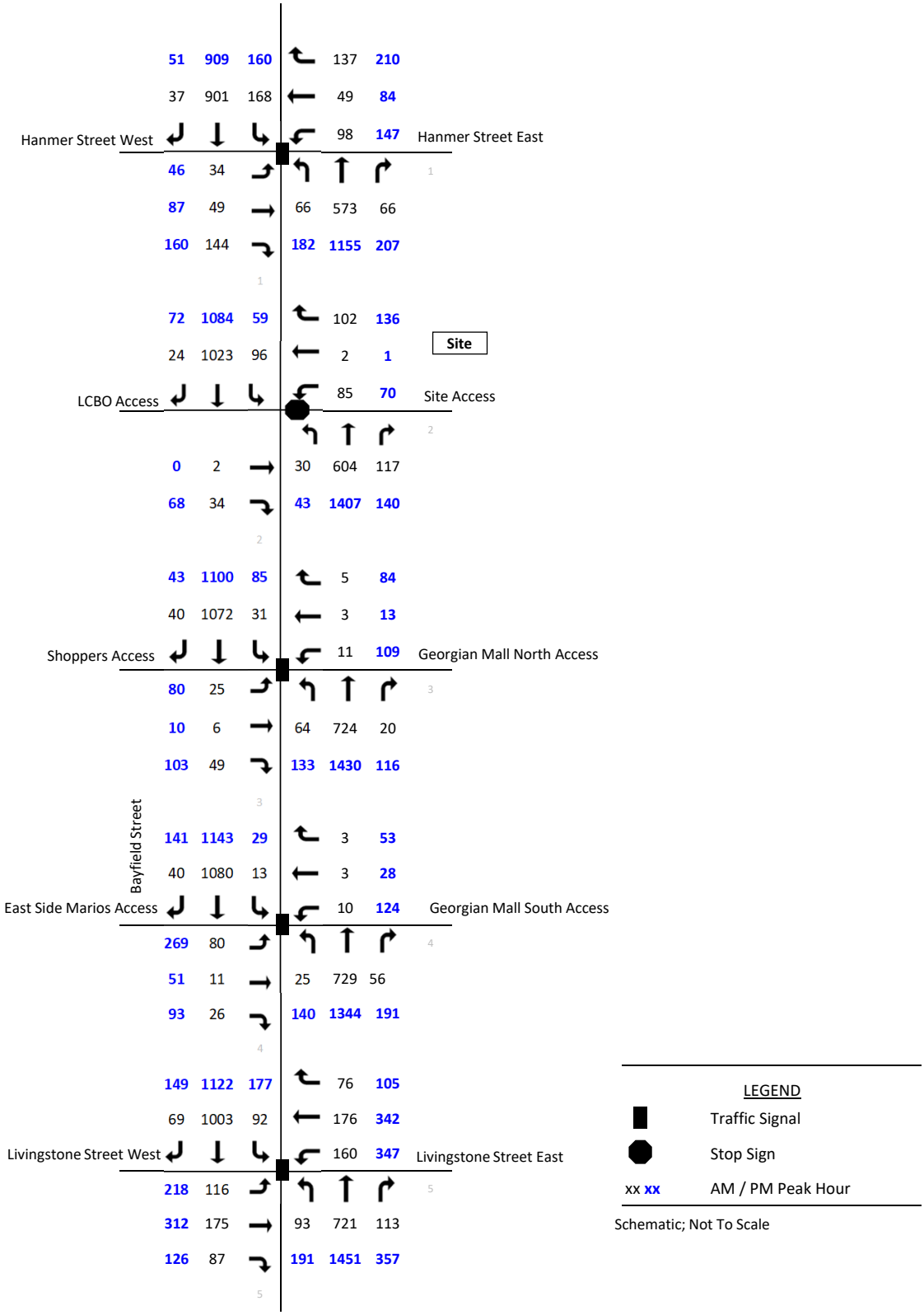
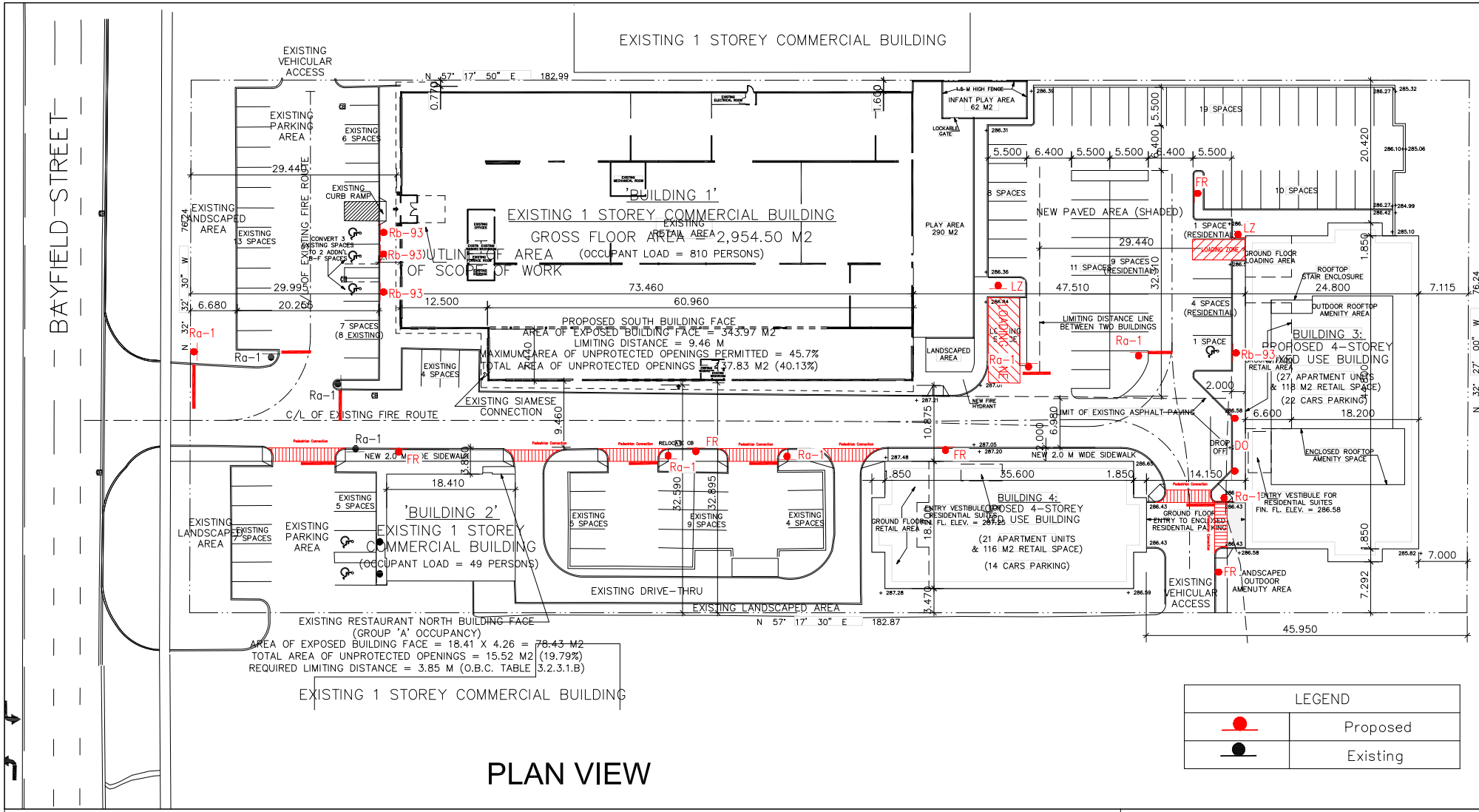


Figure 9: Traffic Signage and Pavement Marking Plan



PLAN VIEW

General Notes:

1. Traffic signs placed as close to the edge of the sidewalk or the back of the curb as possible.
2. New signs should be installed on the proposed utility/street light poles whenever possible in order to minimize the number of new u-channel.
3. All signage should be installed in accordance to the Ontario Traffic Manuals (Book 5, Regulatory Signs)
4. Site Plan by: kima., dated January, 2023
5. All units are in metres.

SIGN LEGEND

SIGN TYPE	DESCRIPTION	QUANTITY
Ra-1	STOP SIGN	6
FR	FIRE ROUTE SIGN	5
Rb-93	DISABLED PARKING PERMIT SIGN	4
LZ	LOADING ZONE SIGN (NO PARKING)	2
DO	PICK-UP/DROP OFF ONLY SIGN	1

PAVEMENT MARKINGS AND SYMBOLS

	STOP BAR 0.30m THICK, WHITE LINE
	TRAFFIC SIGN
	PARKING SPACE PAVEMENT MARKING 0.1m THICK, WHITE LINE

REVIEWED

Date:

APPROVED

Date:

REVISIONS

DESCRIPTION	DATE	BY	APPROVED
Issued for SPA - 1st Submission	20230313		

535 BAYFIELD STREET
CITY of BARRIE, ONTARIO

TRAFFIC SIGNAGE & PAVEMENT MARKING PLAN

LICENSED PROFESSIONAL ENGINEER
March, 2023
A. SEEGOBIN
100120450
PROVINCE OF ONTARIO

DATE: March 13, 2023

TRANS-PLAN
transportation engineering
67 Mowat Avenue
Toronto, Ontario, M6K 3E3
tel: (647) 931-7383
website: www.trans-plan.com

DATE : March 13, 2023

SCALE : 1:1000

DRAWN BY : A.K.

DESIGNED BY : A.K.

CHECKED BY : A.S.

PROJECT No.

DRAWING No. 1

Figure 10 - Proposed Construction Traffic (Truck) Route

Proposed Condominium Redevelopment
535 Bayfield Street,
City of Barrie, ON

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Toronto, Ontario, M6K 3E3
tel: (647) 931-7383
website: www.trans-plan.com

SCALE: N.T.S UNITS: N/A

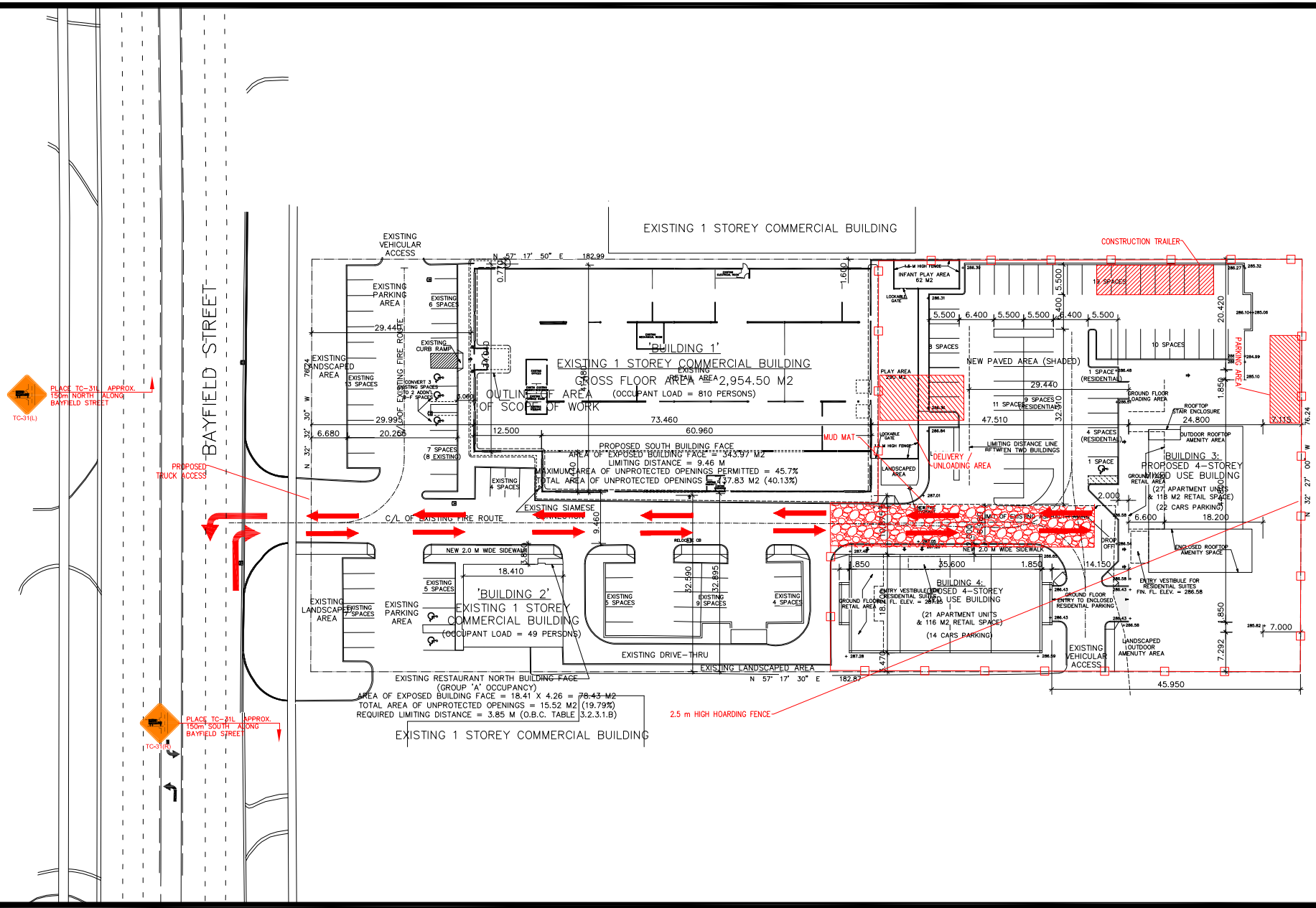

Figure 11 - Construction Management Plan, Conceptual Layout

Proposed Mixed-Use Development
535 Bayfield Street,
City of Barrie, ON

Source: Keith Loffer McAlpine Architects, January, 2023

SCALE: 1:1000 UNITS: METRES

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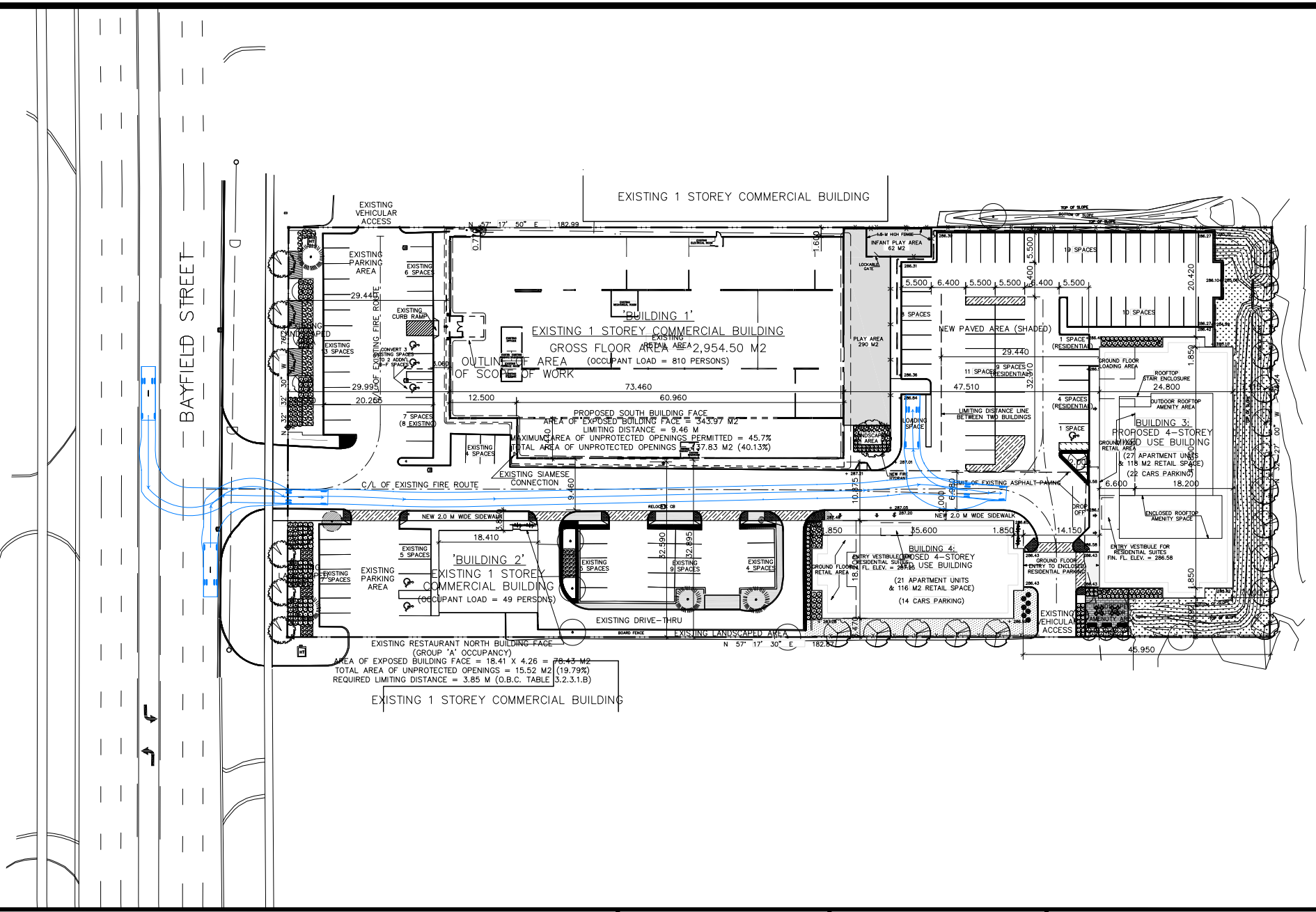
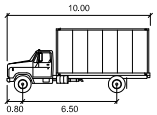


Figure 12 - Loading Vehicle (MSU), Entering Site and Loading Area

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



MSU	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.1

CONSTRUCTION NORTH
TRUE NORTH

Source: Site Plan by klma., dated January, 2023

SCALE: 1:800 UNITS: m

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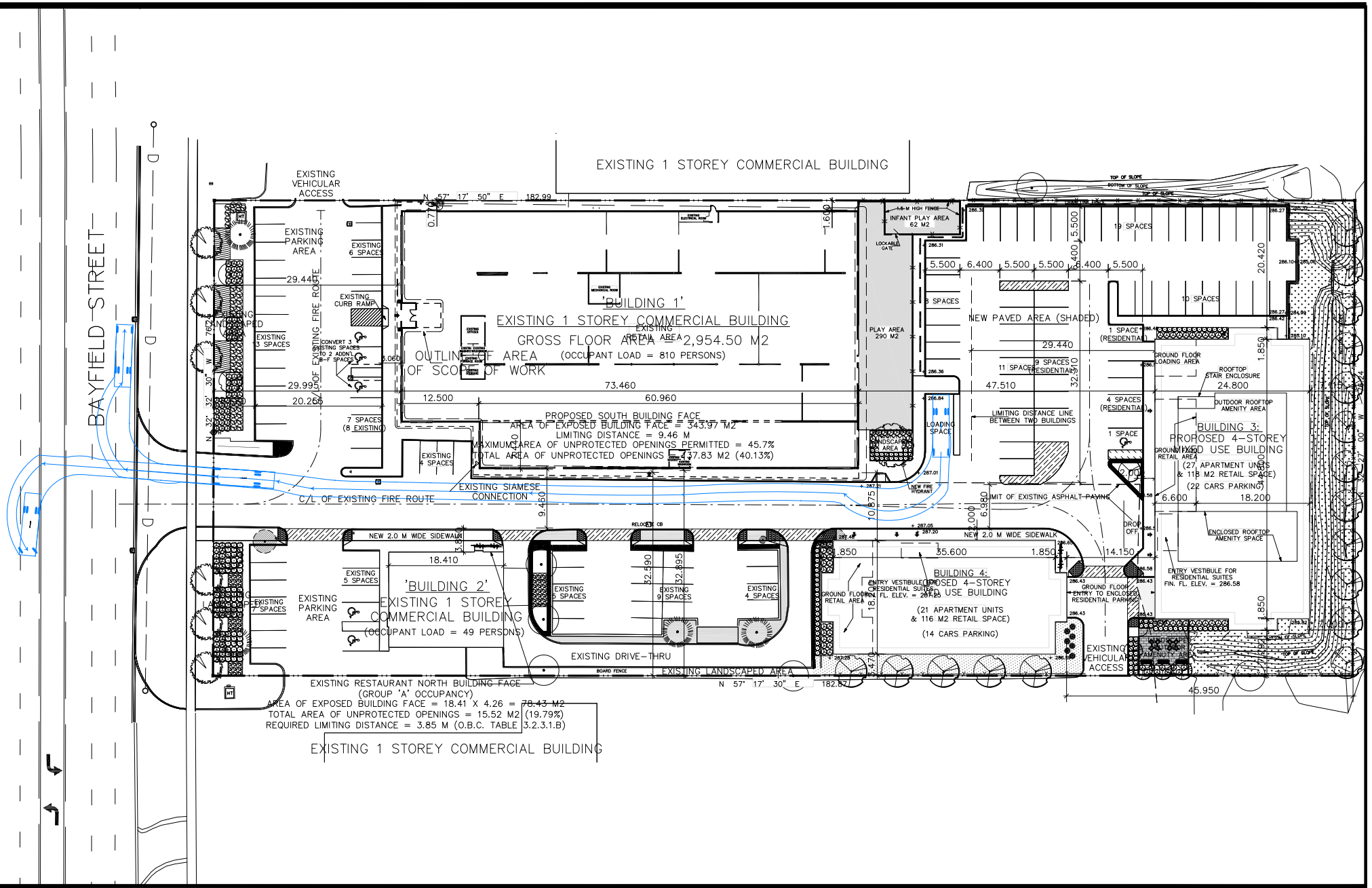
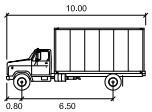


Figure 13 - Loading Vehicle (MSU), Exiting and Loading Area and Site

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



MSU	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.1

CONSTRUCTION NORTH
TRUE NORTH

Source: Site Plan by kma., dated January, 2023

SCALE: 1:800 UNITS: m

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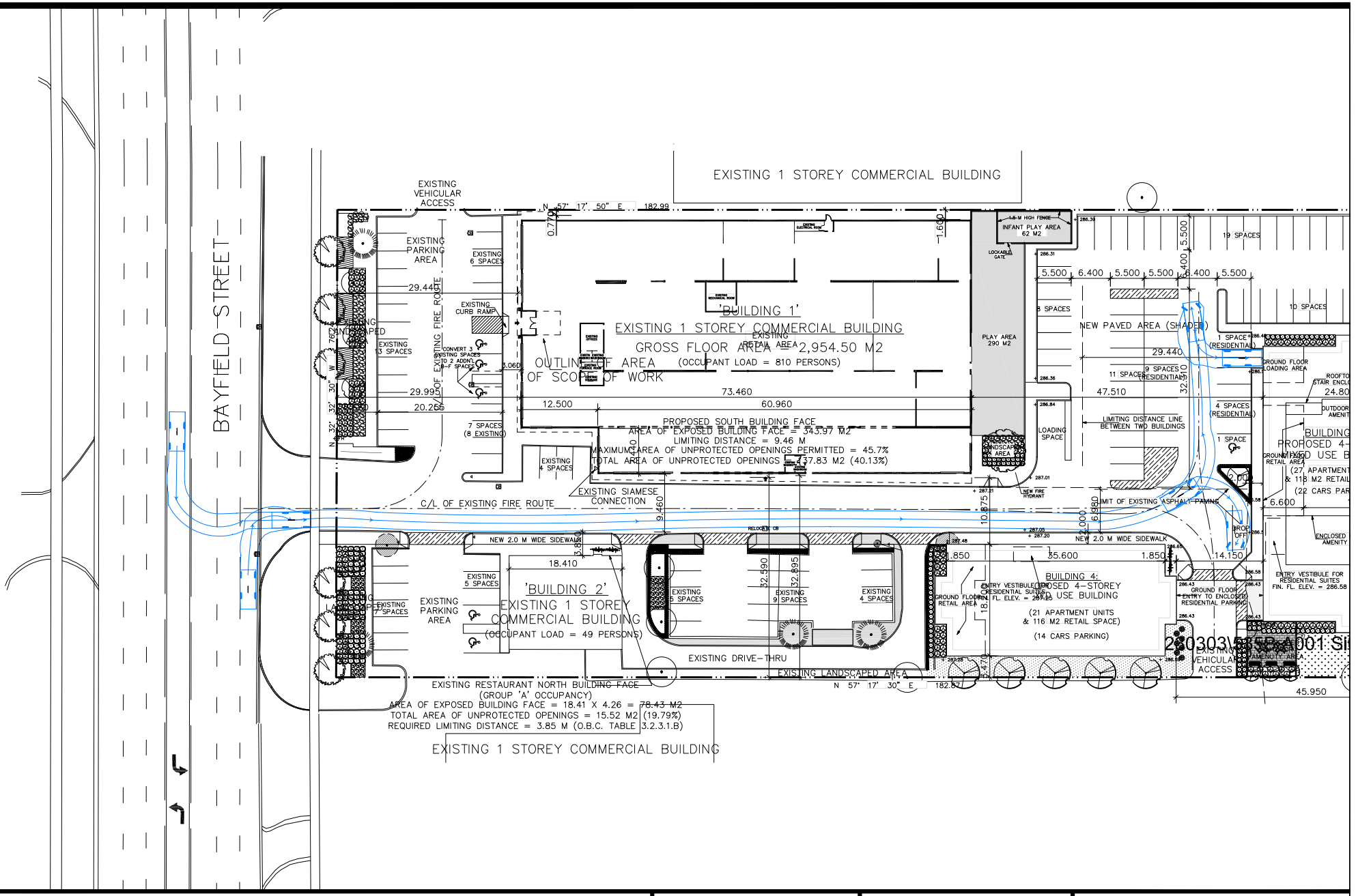
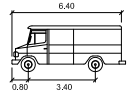


Figure 14 - Loading Vehicle (LSU), Entering Site and Loading Area

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



LSU	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.8

CONSTRUCTION NORTH
TRUE NORTH

Source: Site Plan by kma., dated January, 2023

SCALE: 1:800 UNITS: m

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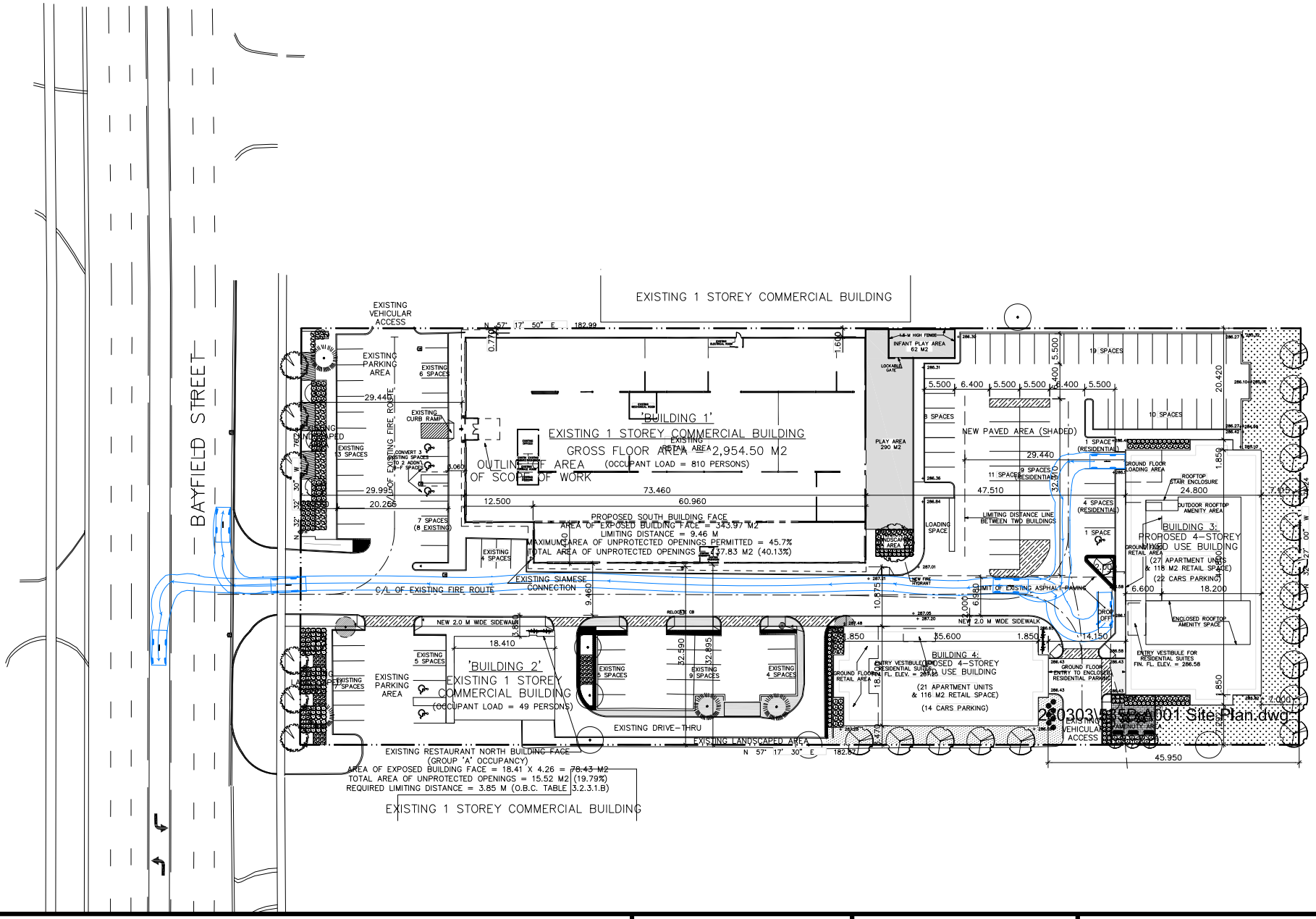
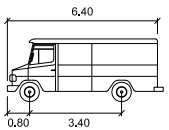


Figure 15 - Loading Vehicle (LSU), Exiting Loading Area and Site

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



LSU	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.8

CONSTRUCTION NORTH
TRUE NORTH

Source: Site Plan by klma., dated January, 2023

SCALE: 1:800 UNITS: m

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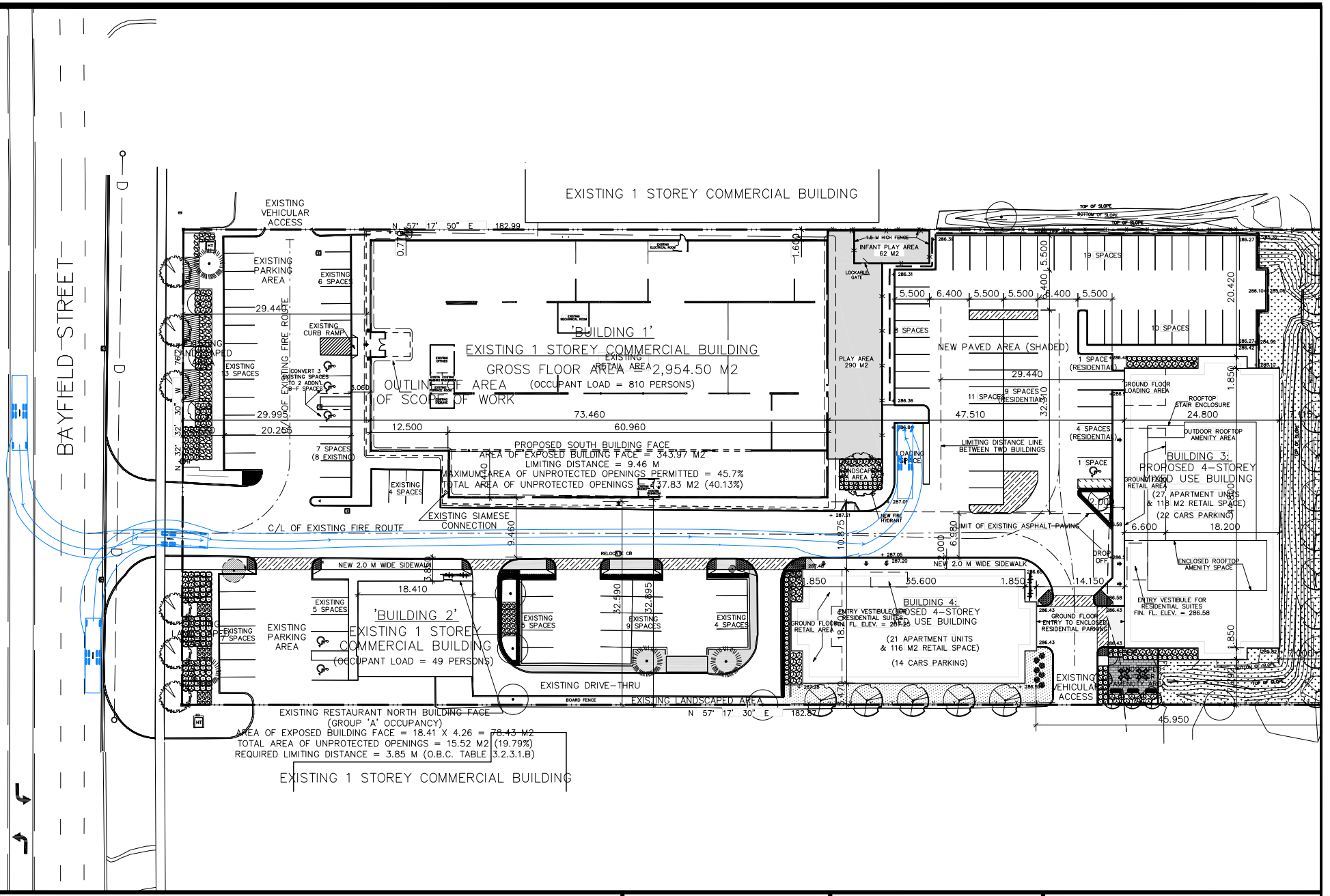
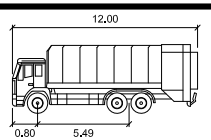


Figure 16 - Waste Collection Vehicle, Entering Site and Loading Area

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



Waste Collection meters

Width	: 2.40
Track	: 2.40
Lock to Lock Time	: 6.0
Steering Angle	: 25.9

CONSTRUCTION NORTH
TRUE NORTH

SCALE: 1:800 UNITS: m

Source: Site Plan by kima., dated January, 2023

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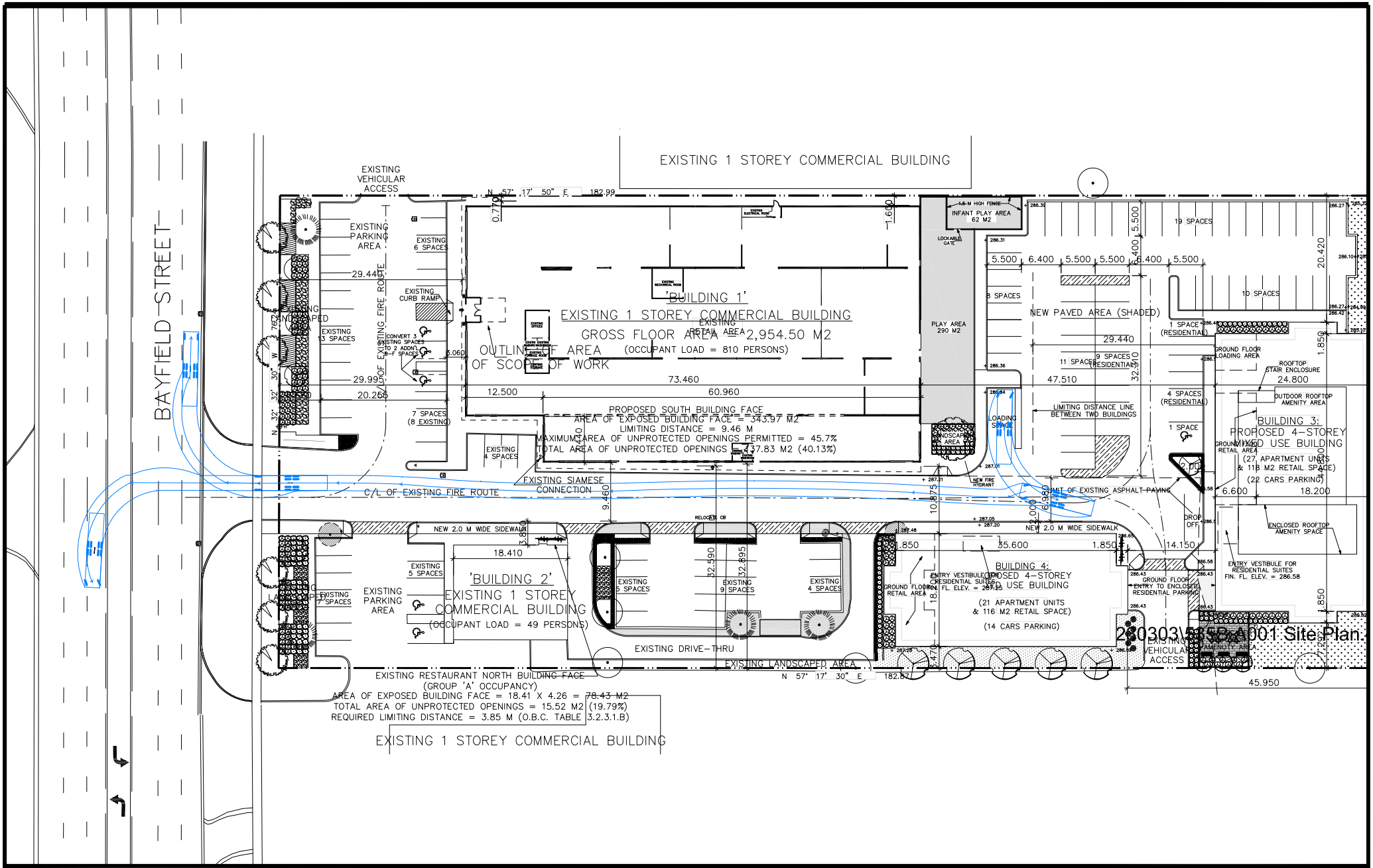
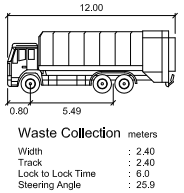


Figure 17 - Waste Collection Vehicle, Exiting Loading Area and Site

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



CONSTRUCTION NORTH
TRUE NORTH

Source: Site Plan by klma., dated January, 2023

SCALE: 1:800 UNITS: m

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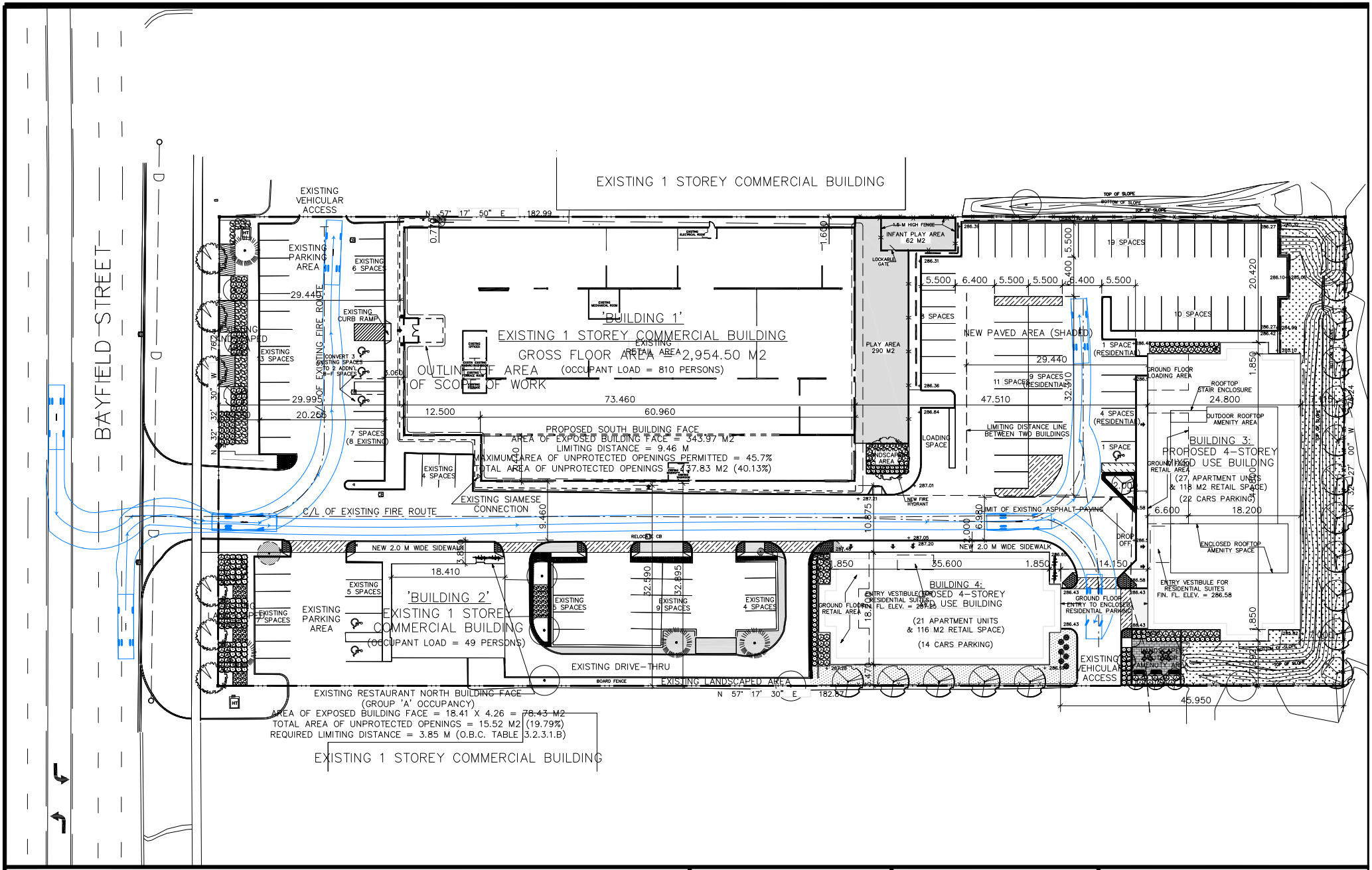
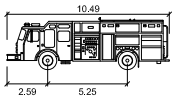


Figure 18 - Fire Truck, Entering Site

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



Fire Truck A	meters
Width	: 2.54
Track	: 2.54
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

CONSTRUCTION NORTH

SCALE: 1:800 UNITS: m

Source: Site Plan by klma., dated January, 2023

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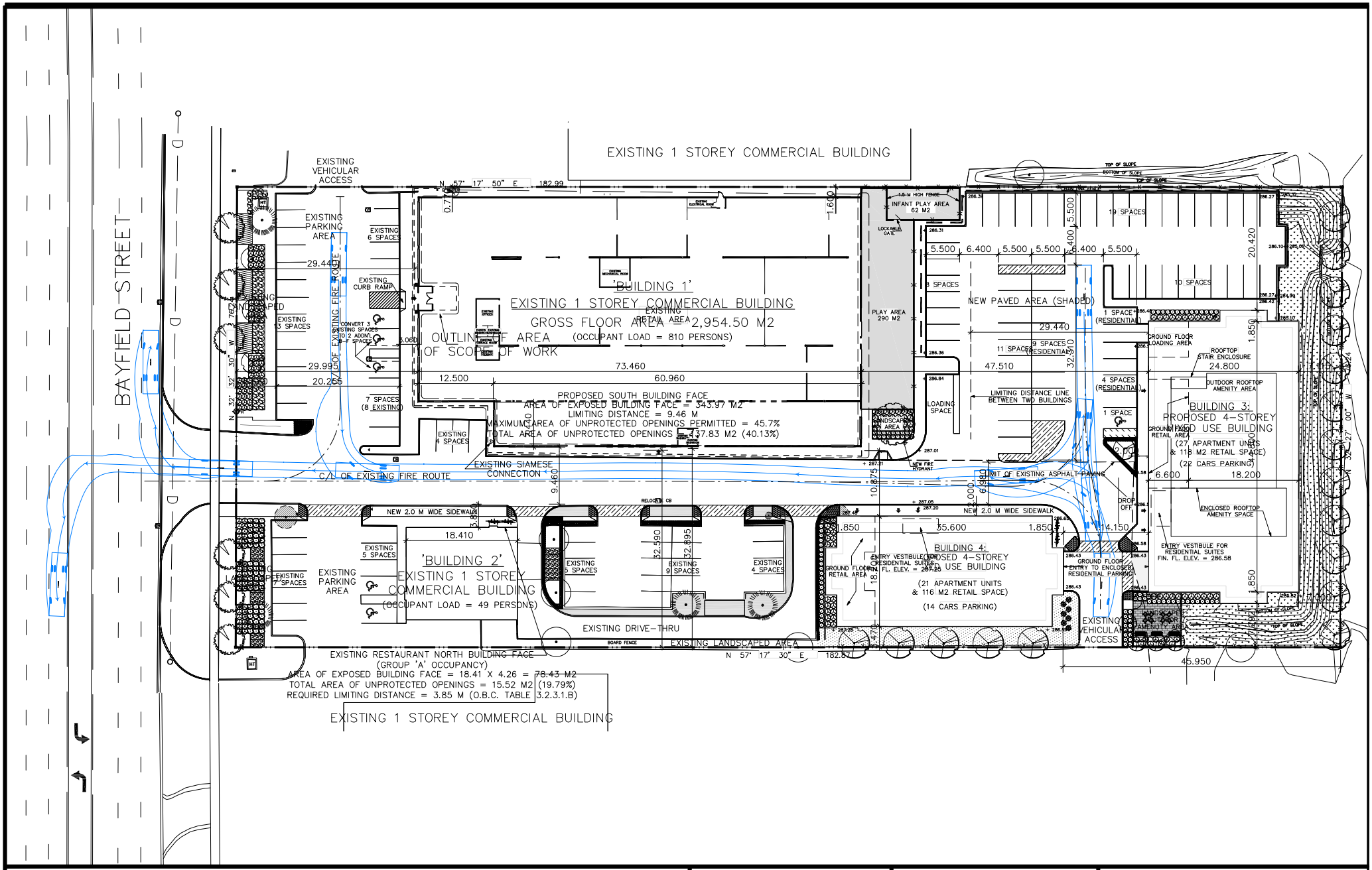
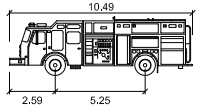


Figure 19 - Fire Truck, Exiting Site

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



Fire Truck A

	meters
Width	: 2.54
Track	: 2.54
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

CONSTRUCTION NORTH
TRUE NORTH

Source: Site Plan by kma., dated January, 2023

SCALE: 1:800 UNITS: m

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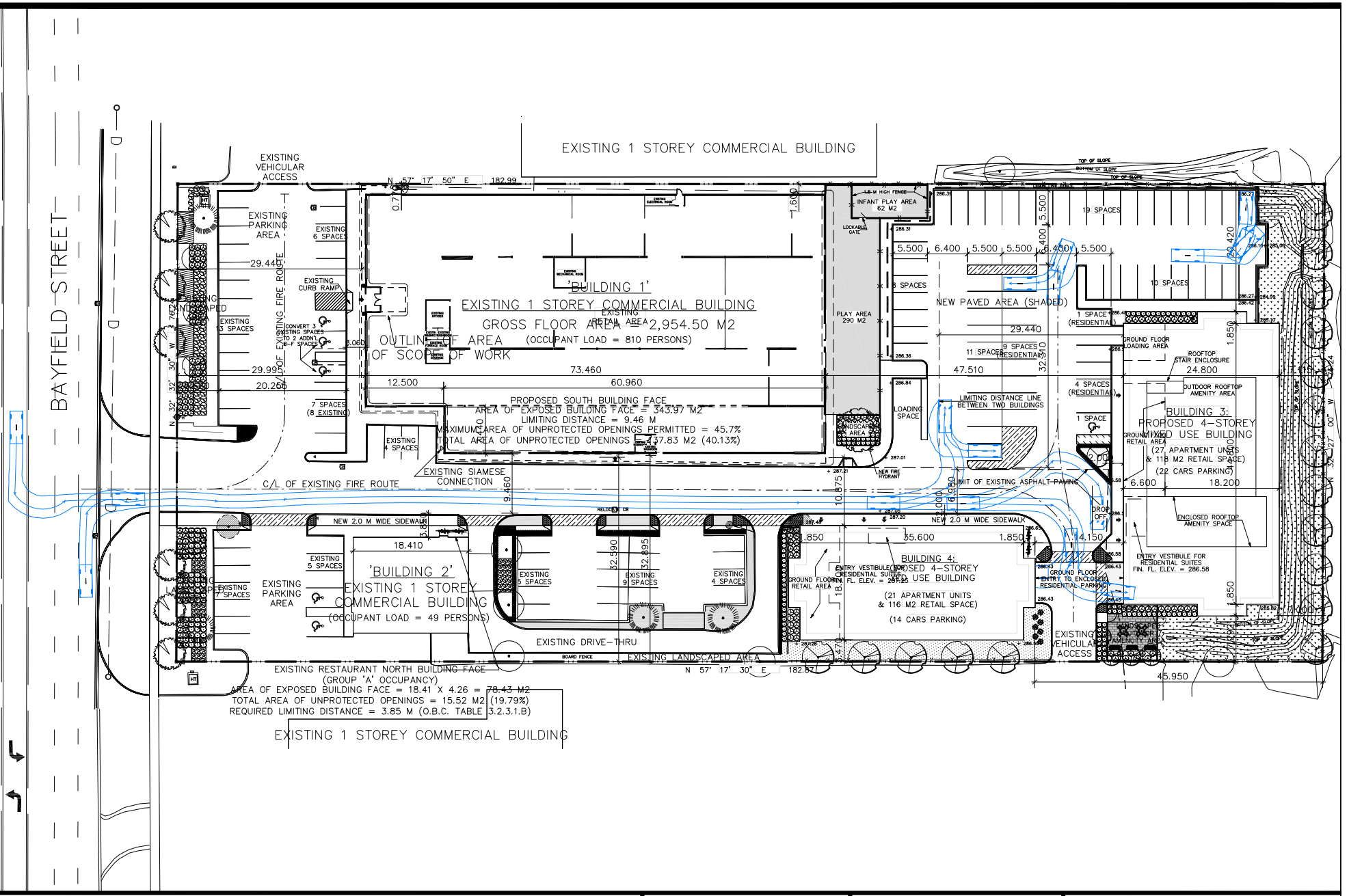
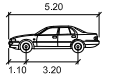


Figure 20 - Passenger Vehicle, Entering Site and the Critical Spaces

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



Passenger Vehicles, 5.2m
meters

Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 36.2

CONSTRUCTION NORTH
TRUE NORTH

Source: Site Plan by kma., dated January, 2023

SCALE: 1:800 UNITS: m

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website: www.trans-plan.com

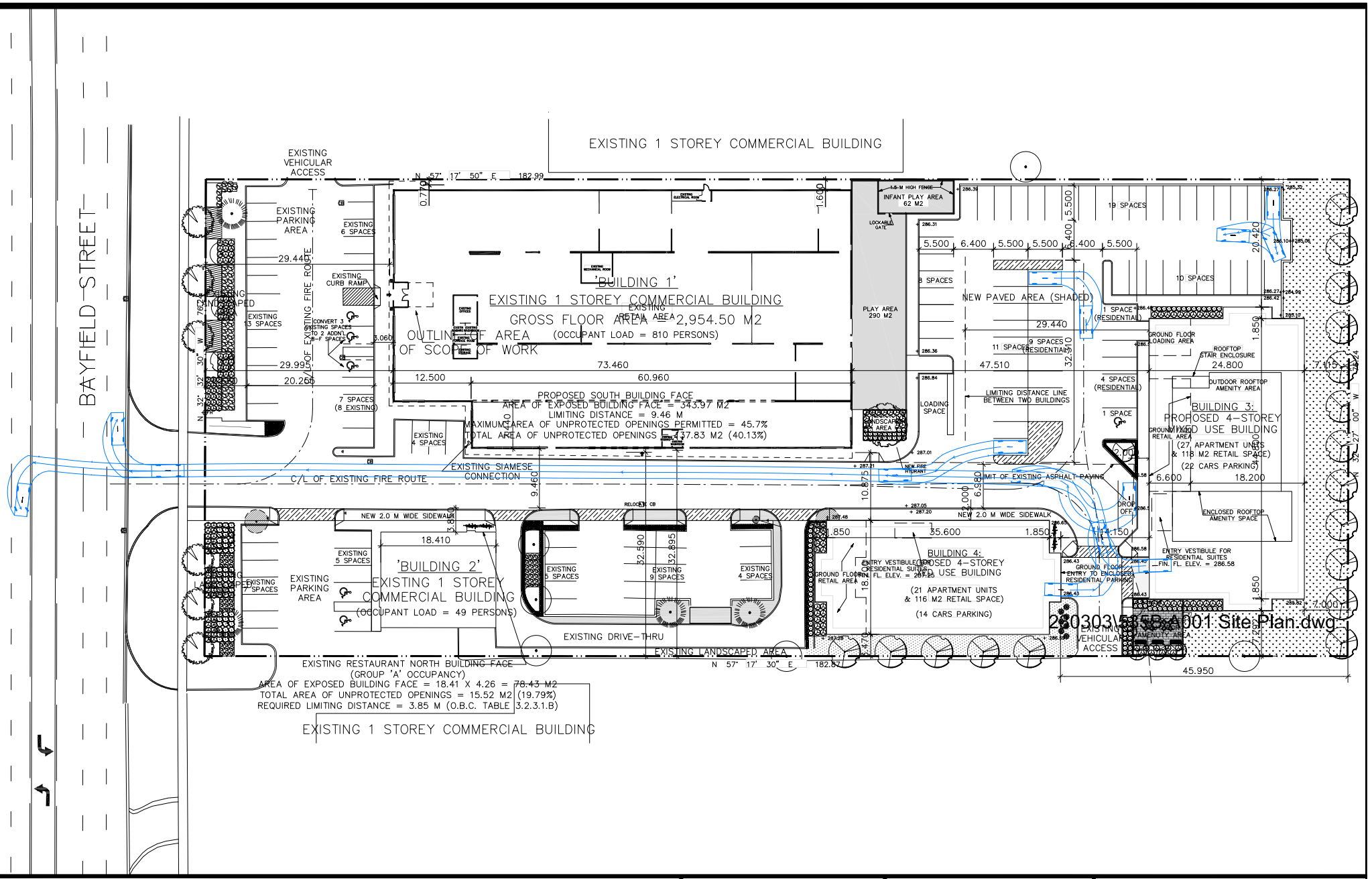
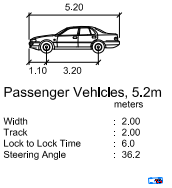


Figure 21 - Passenger Vehicle, Exiting the Critical Spaces and Site

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



CONSTRUCTION NORTH
TRUE NORTH

SCALE: 1:800 UNITS: m

Source: Site Plan by klma., dated January, 2023

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Toronto, Ontario, M6K 3E3
tel: (647) 931-7383
website: www.trans-plan.com

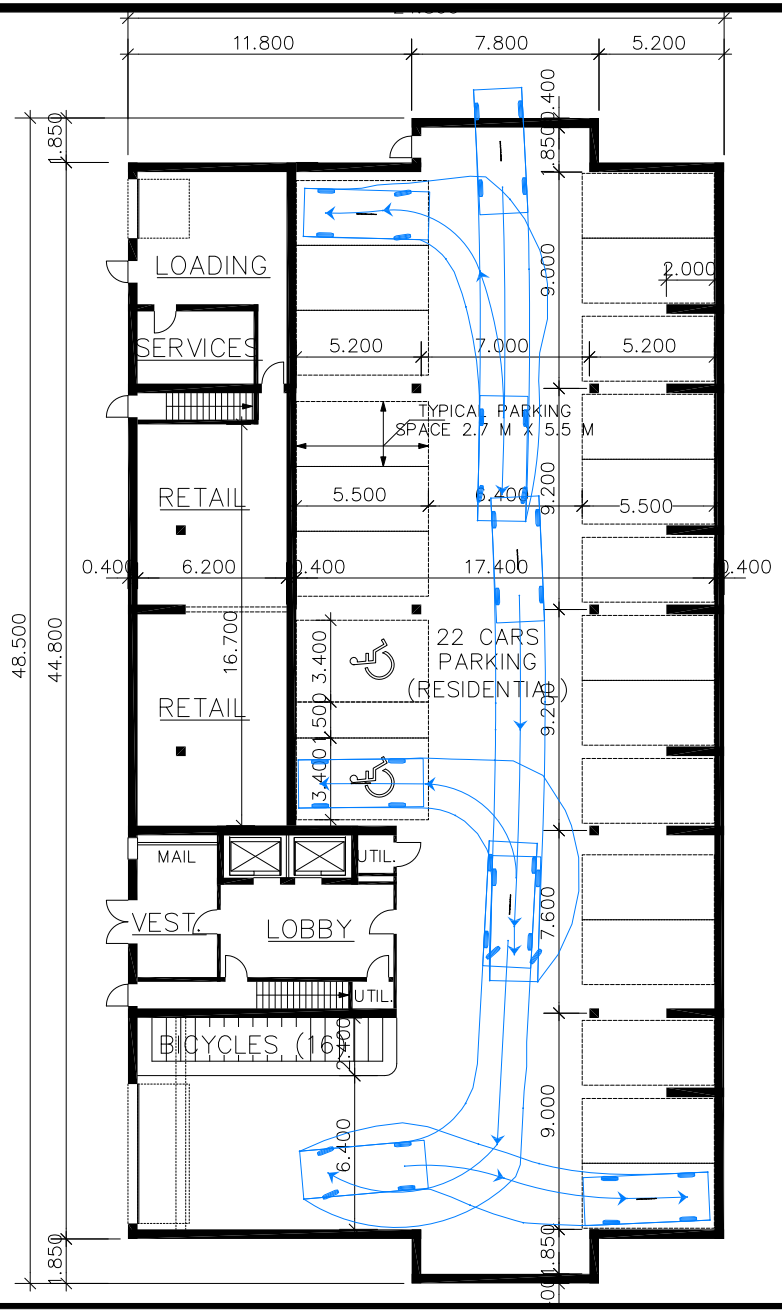
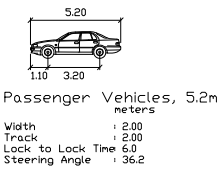


Figure 22 - Passenger Vehicle, Entering and Exiting Critical Spaces at Grade

PROPOSED MIXED-USE DEVELOPMENT
535 Bayfield Street,
Barrie, ON



Source: Site Plan by klma., dated January, 2023

SCALE: 1:800 UNITS: m

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transportation engineering consultants
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Toronto, Ontario, M6K 3E3
tel: (647) 931-7383
website: www.trans-plan.com

APPENDICES

Appendix A – Turning Movement Counts and Signal Timing Plans

Appendix B – Capacity and Queuing Analysis Sheets

Appendix C – Level of Service Definitions

Appendix D – City of Barrie, Zoning By-law Excerpts

Appendix E – City's Correspondence

Appendix F – Proxy Parking Survey Results

Appendix G – Turn Lane Warrants

APPENDIX A

Turning Movement Counts and Signal Timing Plans

THE CORPORATION OF THE CITY OF BARRIE

August 03, 2021 File: T07-SI

Jing Min
Trans-Plan
785 Dundas Street West
Toronto, Ontario M6J 1V2

Dear Ms. Min,

RE: **Traffic Signal Timings**

With respect to your inquiry on July 22, 2021, attached are the Signal Timings for the following intersections:

- Bayfield Street @ Hanmer Street West
- Bayfield Street @ Georgian Mall North Access
- Bayfield Street @ Livingstone Street
- Bayfield Street @ Georgian Mall South Access

Signalized Intersections within the City of Barrie function as a semi-actuated; meaning the signals remain green on the major road/ main street until a vehicle is detected on the minor road/ side street or a pedestrian pushes the pushbutton to activate the pedestrian phase.

Vehicles on the minor road/side street are detected by electromagnetic wires, which are embedded in the pavement on the side street near the painted stop bar. Vehicle presence only on the side street would result in a possible green time of between the minimum and maximum times, as noted, depending on vehicle demand detected.

Pedestrians must push the pedestrian push button to be detected. Pedestrian “Walk” and “Flashing Don’t Walk” times on the side street, as noted, would be used in the event that the pedestrian push button was activated.

If you require any further information please feel free to contact me at (705) 739-4220 ext. 4937.

Sincerely,

Stephen Salis, C.E.T.
Transportation Systems Technologist

Bayfield Street @ Hanmer Street West – FREE PLAN (NO COORDINATION)

		Vehicular Indications				Pedestrian Indications	
Roadway	**Direction**	**Minimum Green**	**Maximum Green**	**Amber**	**All Red**	**Walk**	**Flashing Don't Walk**
Bayfield Street (main street)	Advanced Northbound Left Turn	5	15	3	1	N/A	N/A
Bayfield Street (main street)	Advanced Southbound Left Turn	5	15	3	1	N/A	N/A
Bayfield Street (main street)	Northbound	37	37	4	2	25	12
Bayfield Street (main street)	Southbound	37	37	4	2	25	12
Hanmer Street (side street)	Advanced Eastbound Left Turn	5	15	3	1	N/A	N/A
Hanmer Street (side street)	Advanced Westbound Left Turn	5	15	3	1	N/A	N/A
Hanmer Street (side street)	Eastbound	10	35	4	2	10	15
Hanmer Street (side street)	Westbound	10	35	4	2	10	15

NOTE: All times are recorded in seconds, based on full demand.

Bayfield Street @ Georgian Mall North Access – FREE PLAN (NO COORDINATION)

		Vehicular Indications				Pedestrian Indications	
Roadway	**Direction**	**Minimum Green**	**Maximum Green**	**Amber**	**All Red**	**Walk**	**Flashing Don't Walk**
Bayfield Street (main street)	Advanced Northbound Left Turn	7	7	3	1	N/A	N/A
Bayfield Street (main street)	Advanced Southbound Left Turn	7	7	3	1	N/A	N/A
Bayfield Street (main street)	Northbound	24	24	4	2	11	13
Bayfield Street (main street)	Southbound	24	24	4	2	11	13
Georgian Mall North Access (side street)	Eastbound	10	30	4	2	12	18
Georgian Mall North Access (side street)	Westbound	10	30	4	2	12	18

NOTE: All times are recorded in seconds, based on full demand.

Bayfield Street @ Georgian Mall North Access – AM WEEKDAY PLAN (7:30AM – 9:00AM)

Roadway	**Direction**	**Split Timings (Including Amber + All Red)**
Bayfield Street (main street)	Advanced Northbound Left Turn	11
Bayfield Street (main street)	Advanced Southbound Left Turn	11
Bayfield Street (main street)	Northbound	52
Bayfield Street (main street)	Southbound	52
Georgian Mall North Access (side street)	Eastbound	37
Georgian Mall North Access (side street)	Westbound	37
Total Cycle Length		100

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Bayfield Street @ Georgian Mall North Access – NOON WEEKDAY PLAN (9:00AM – 3:30PM, 6:00PM – 9:00PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Bayfield Street (main street)	Advanced Northbound Left Turn	13
Bayfield Street (main street)	Advanced Southbound Left Turn	13
Bayfield Street (main street)	Northbound	92
Bayfield Street (main street)	Southbound	92
Georgian Mall North Access (side street)	Eastbound	45
Georgian Mall North Access (side street)	Westbound	45
Total Cycle Length		150

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Bayfield Street @ Georgian Mall North Access – PM WEEKDAY PLAN (3:30PM – 6:00PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Bayfield Street (main street)	Advanced Northbound Left Turn	12
Bayfield Street (main street)	Advanced Southbound Left Turn	12
Bayfield Street (main street)	Northbound	96
Bayfield Street (main street)	Southbound	96
Georgian Mall North Access (side street)	Eastbound	42
Georgian Mall North Access (side street)	Westbound	42
Total Cycle Length		150

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Bayfield Street @ Livingstone Street – FREE PLAN (NO COORDINATION)

		Vehicular Indications				Pedestrian Indications	
Roadway	**Direction**	**Minimum Green**	**Maximum Green**	**Amber**	**All Red**	**Walk**	**Flashing Don't Walk**
Bayfield Street (main street)	Advanced Northbound Left Turn	7	10	3	1	N/A	N/A
Bayfield Street (main street)	Advanced Southbound Left Turn	7	10	3	1	N/A	N/A
Bayfield Street (main street)	Northbound	24	24	4	2	11	13
Bayfield Street (main street)	Southbound	24	24	4	2	11	13
Livingstone Street (side street)	Advanced Eastbound Left Turn	7	7	3	1	N/A	N/A
Livingstone Street (side street)	Advanced Westbound Left Turn	7	7	3	1	N/A	N/A
Livingstone Street (side street)	Eastbound	10	32	4	2	12	20
Livingstone Street (side street)	Westbound	10	32	4	2	12	20

NOTE: All times are recorded in seconds, based on full demand.

Bayfield Street @ Livingstone Street - AM WEEKDAY PLAN (7:30AM – 9:00AM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Bayfield Street (main street)	Advanced Northbound Left Turn	13
Bayfield Street (main street)	Advanced Southbound Left Turn	13
Bayfield Street (main street)	Northbound	37
Bayfield Street (main street)	Southbound	37
Livingstone Street (side street)	Advanced Eastbound Left Turn	12
Livingstone Street (side street)	Advanced Westbound Left Turn	11
Livingstone Street (side street)	Eastbound	39
Livingstone Street (side street)	Westbound	38
Total Cycle Length		100

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Bayfield Street @ Livingstone Street – NOON WEEKDAY PLAN (9:00AM – 3:30PM, 6:00PM – 9:00PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Bayfield Street (main street)	Advanced Northbound Left Turn	18
Bayfield Street (main street)	Advanced Southbound Left Turn	18
Bayfield Street (main street)	Northbound	69
Bayfield Street (main street)	Southbound	69
Livingstone Street (side street)	Advanced Eastbound Left Turn	25
Livingstone Street (side street)	Advanced Westbound Left Turn	18
Livingstone Street (side street)	Eastbound	45
Livingstone Street (side street)	Westbound	38
Total Cycle Length		150

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Bayfield Street @ Livingstone Street – PM WEEKDAY PLAN (3:30PM – 6:00PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Bayfield Street (main street)	Advanced Northbound Left Turn	20
Bayfield Street (main street)	Advanced Southbound Left Turn	20
Bayfield Street (main street)	Northbound	66
Bayfield Street (main street)	Southbound	66
Livingstone Street (side street)	Advanced Eastbound Left Turn	26
Livingstone Street (side street)	Advanced Westbound Left Turn	21
Livingstone Street (side street)	Eastbound	43
Livingstone Street (side street)	Westbound	38
Total Cycle Length		150

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Bayfield Street @ Georgian Mall South Access – FREE PLAN (NO COORDINATION)

		Vehicular Indications				Pedestrian Indications	
Roadway	**Direction**	**Minimum Green**	**Maximum Green**	**Amber**	**All Red**	**Walk**	**Flashing Don't Walk**
Bayfield Street (main street)	Advanced Northbound Left Turn	7	7	3	1	N/A	N/A
Bayfield Street (main street)	Advanced Southbound Left Turn	7	7	3	1	N/A	N/A
Bayfield Street (main street)	Northbound	24	24	4	2	14	10
Bayfield Street (main street)	Southbound	24	24	4	2	14	10
Georgian Mall North Access (side street)	Eastbound	10	30	4	2	12	17
Georgian Mall North Access (side street)	Westbound	10	30	4	2	12	17

NOTE: All times are recorded in seconds, based on full demand.

Bayfield Street @ Georgian Mall South Access - AM WEEKDAY PLAN (7:30AM – 9:00AM)

Roadway	**Direction**	**Split Timings (Including Amber + All Red)**
Bayfield Street (main street)	Advanced Northbound Left Turn	11
Bayfield Street (main street)	Advanced Southbound Left Turn	11
Bayfield Street (main street)	Northbound	51
Bayfield Street (main street)	Southbound	51
Georgian Mall North Access (side street)	Eastbound	38
Georgian Mall North Access (side street)	Westbound	38
Total Cycle Length		100

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Bayfield Street @ Georgian Mall South Access – NOON WEEKDAY PLAN (9:00AM – 3:30PM, 6:00PM – 9:00PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Bayfield Street (main street)	Advanced Northbound Left Turn	13
Bayfield Street (main street)	Advanced Southbound Left Turn	13
Bayfield Street (main street)	Northbound	92
Bayfield Street (main street)	Southbound	92
Georgian Mall North Access (side street)	Eastbound	45
Georgian Mall North Access (side street)	Westbound	45
Total Cycle Length		150

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Bayfield Street @ Georgian Mall South Access – PM WEEKDAY PLAN (3:30PM – 6:00PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Bayfield Street (main street)	Advanced Northbound Left Turn	12
Bayfield Street (main street)	Advanced Southbound Left Turn	12
Bayfield Street (main street)	Northbound	96
Bayfield Street (main street)	Southbound	96
Georgian Mall North Access (side street)	Eastbound	42
Georgian Mall North Access (side street)	Westbound	42
Total Cycle Length		150

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

TRANS-PLAN
transportation engineering

Turning Movement Count Diagram

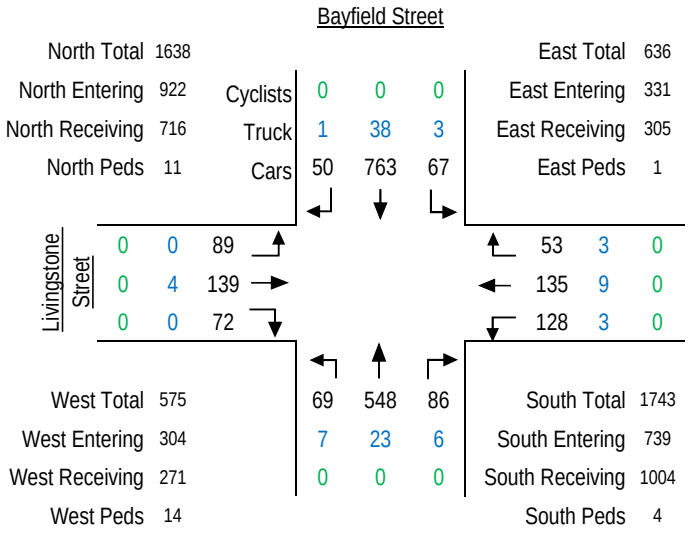
Intersection: Bayfield Street & Livingstone Street

Intersection ID:

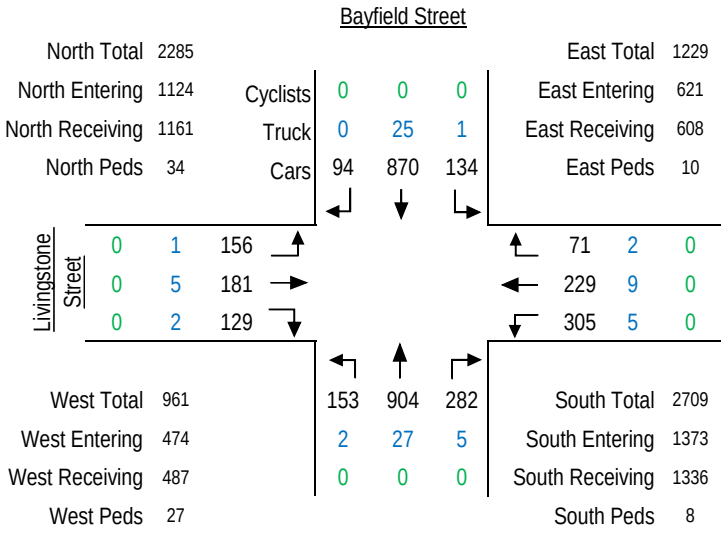
Municipality: Barrie, Ontario

Date: Tuesday, December 11, 2018

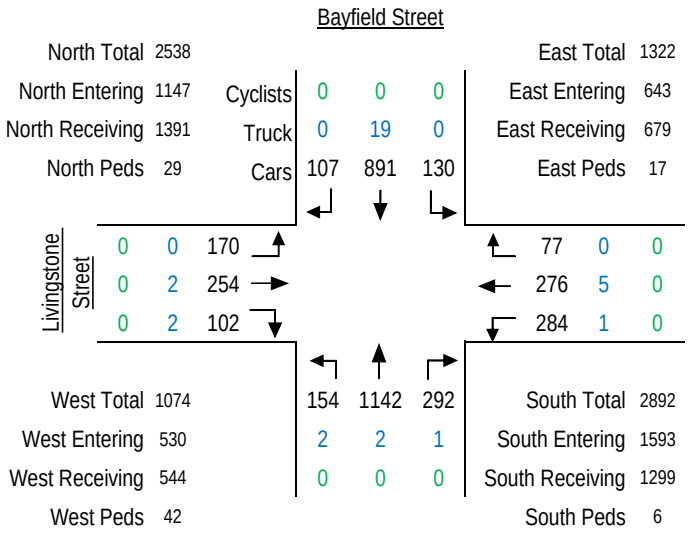
AM Peak Hour: 8:00 to 9:00



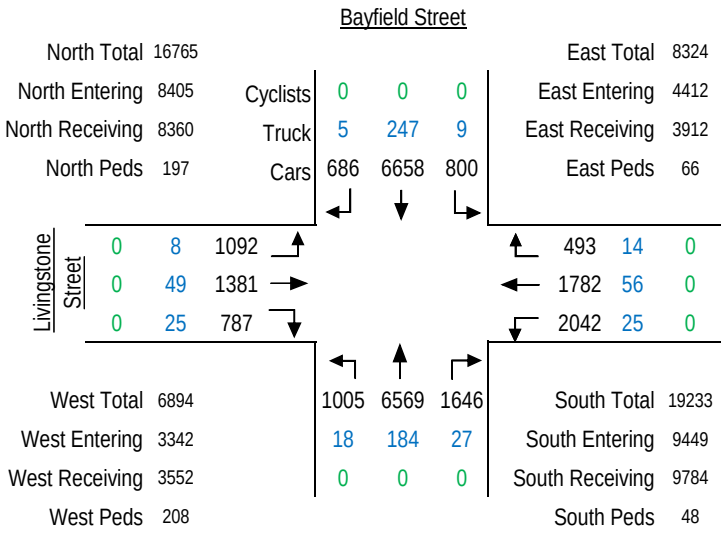
MD Peak Hour: 13:00 to 14:00



PM Peak Hour: 16:30 to 17:30



Total 8-Hour Count



TRANS-PLAN
transportation engineering

Turning Movement Count Diagram

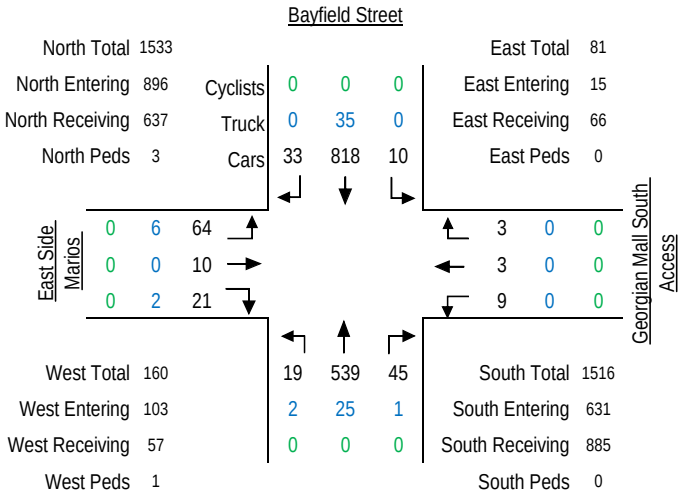
Intersection: Bayfield Street at Georgian Mall South Access / East Side Marios Access

Intersection ID:

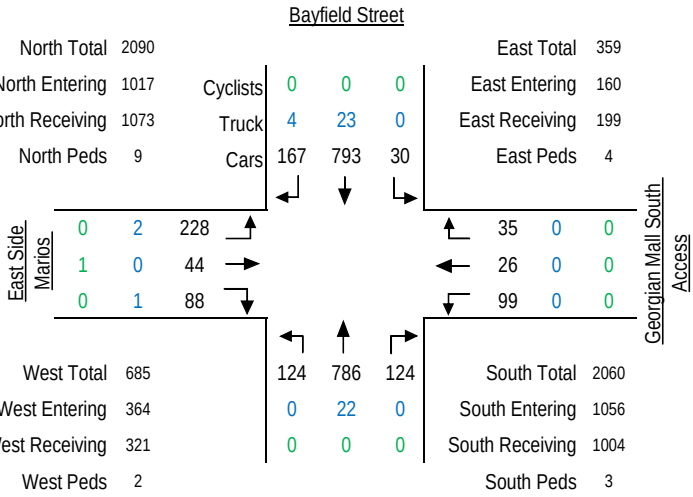
Municipality: Barrie, Ontario

Date: Tuesday, December 11, 2018

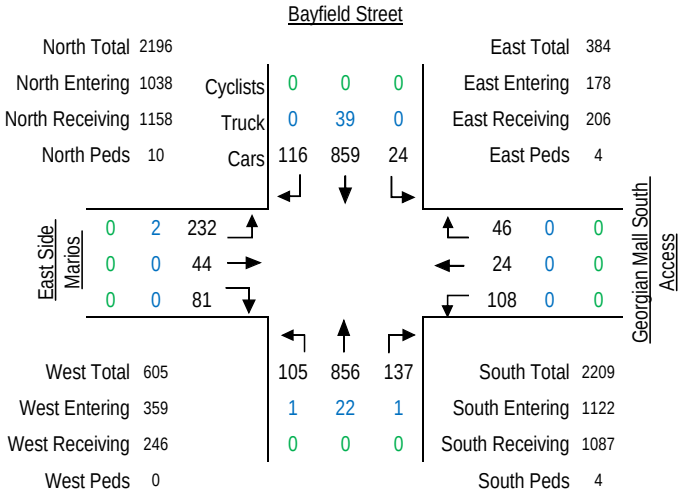
AM Peak Hour: 8:00 to 9:00



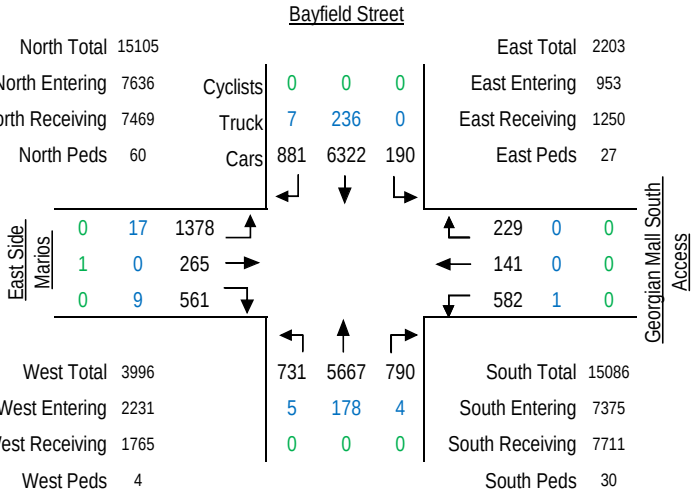
MD Peak Hour: 13:00 to 14:00



PM Peak Hour: 15:15 to 16:15



Total 8-Hour Count



TRANS-PLAN
transportation engineering

Turning Movement Count Diagram

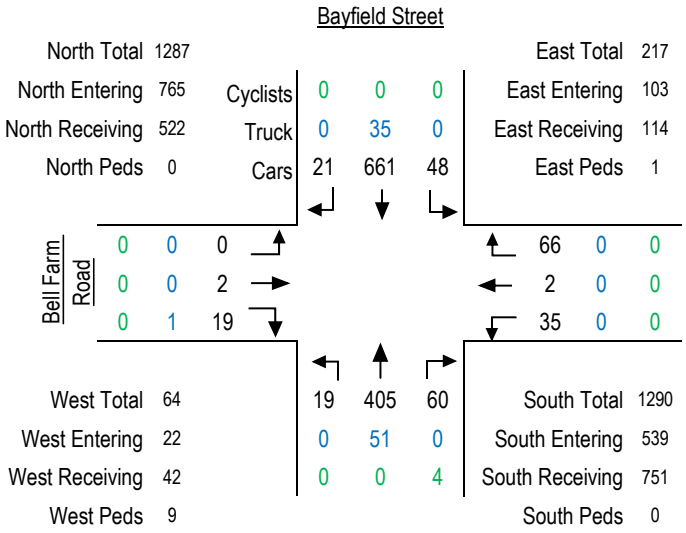
Intersection: 535 Bayfield Street Site Access

Intersection ID:

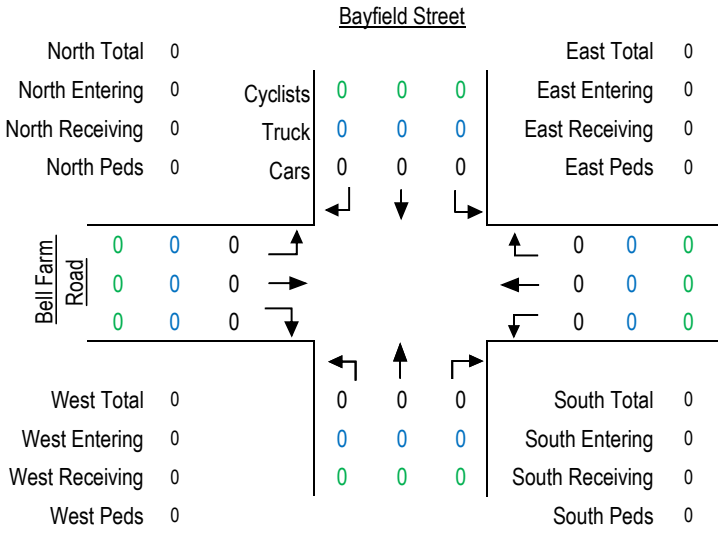
Municipality: Barrie, Ontario

Date: Tuesday, July 13th, 2021

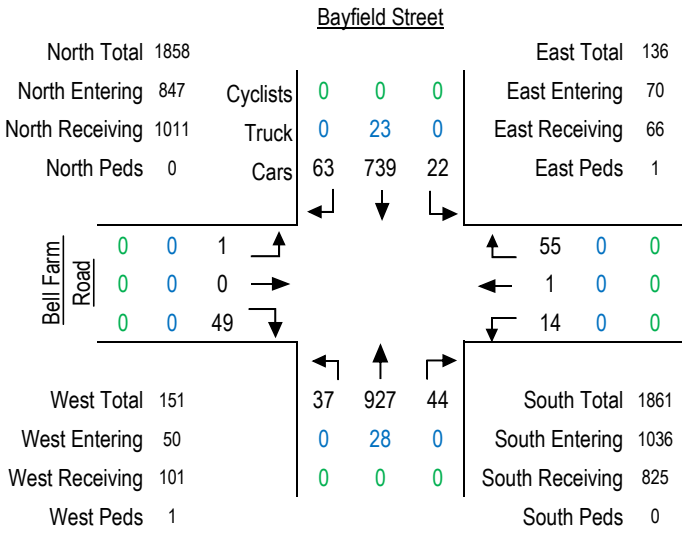
AM Peak Hour: 8:30 to 9:30



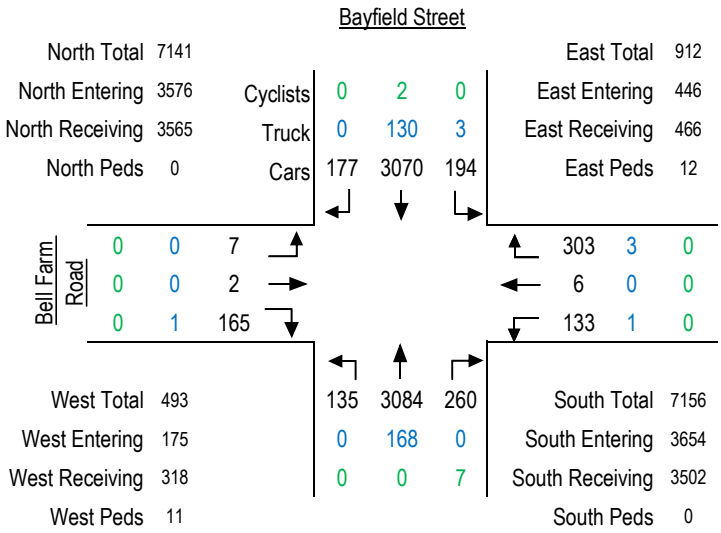
MD Peak Hour: - to -



PM Peak Hour: 16:00 to 17:00



Total 6-Hour Count



Turning Movement Count Diagram

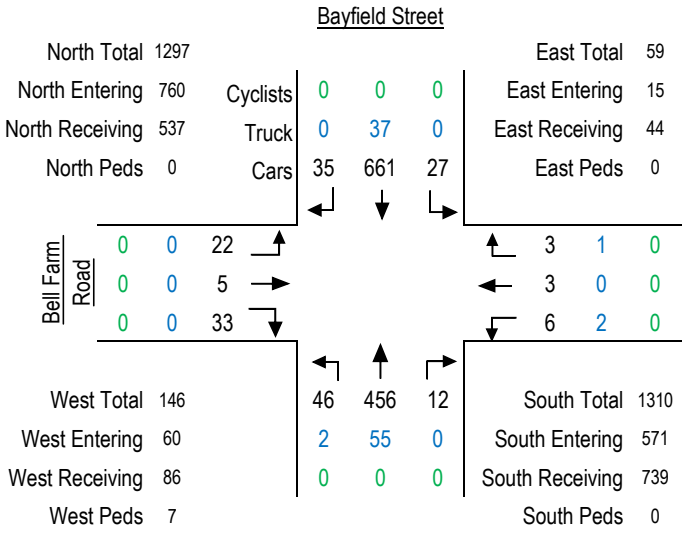
Intersection: Bayfield Street at the Georgian Mall Access Road

Intersection ID:

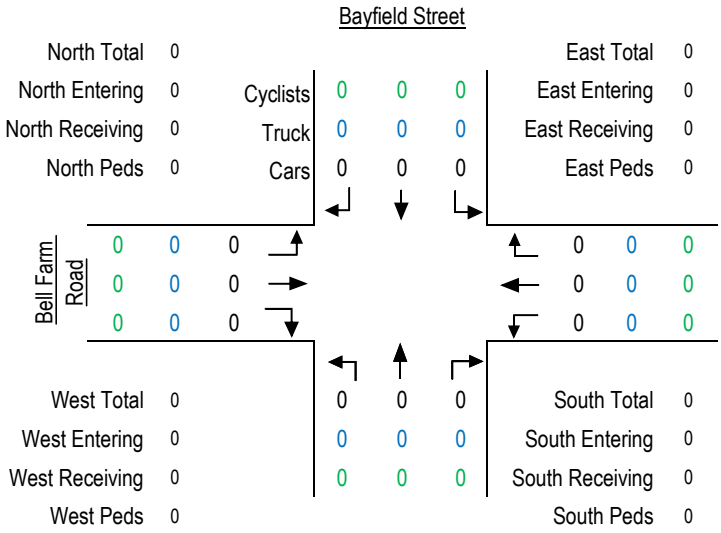
Municipality: Barrie, Ontario

Date: Tuesday, July 13th, 2021

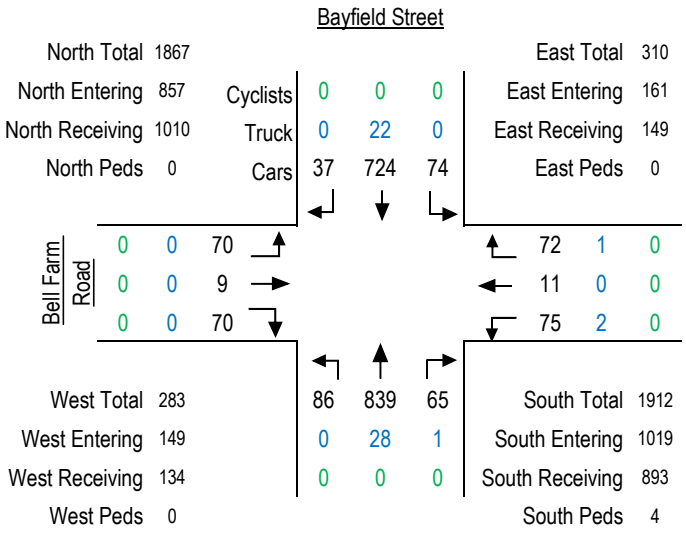
AM Peak Hour: 8:30 to 9:30



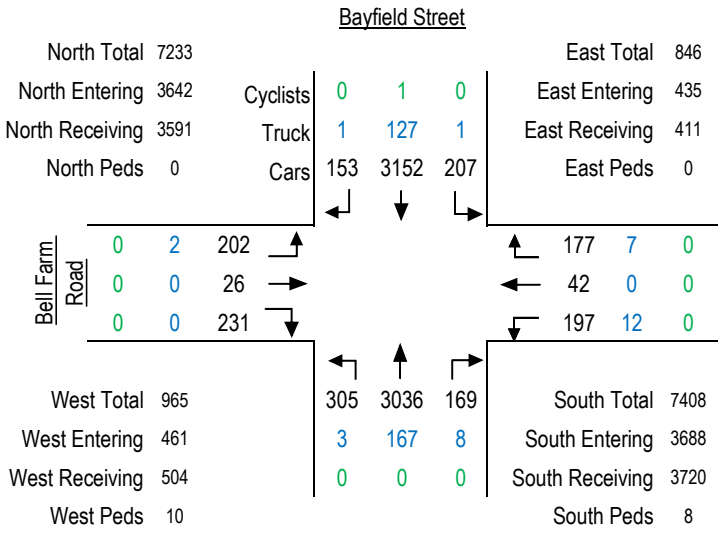
MD Peak Hour: - to -



PM Peak Hour: 16:00 to 17:00



Total 6-Hour Count



TRANS-PLAN
transportation engineering

Turning Movement Count Diagram

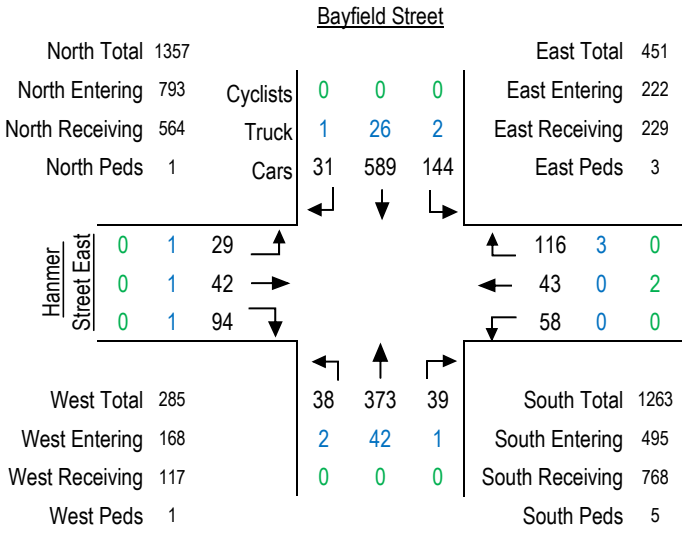
Intersection: Bayfield Street at Hanmer Street East

Intersection ID:

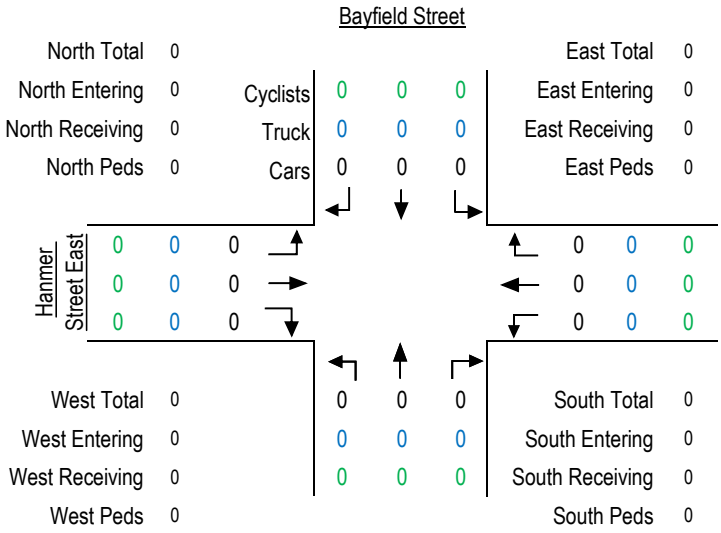
Municipality: Barrie, Ontario

Date: Tuesday, July 13th, 2021

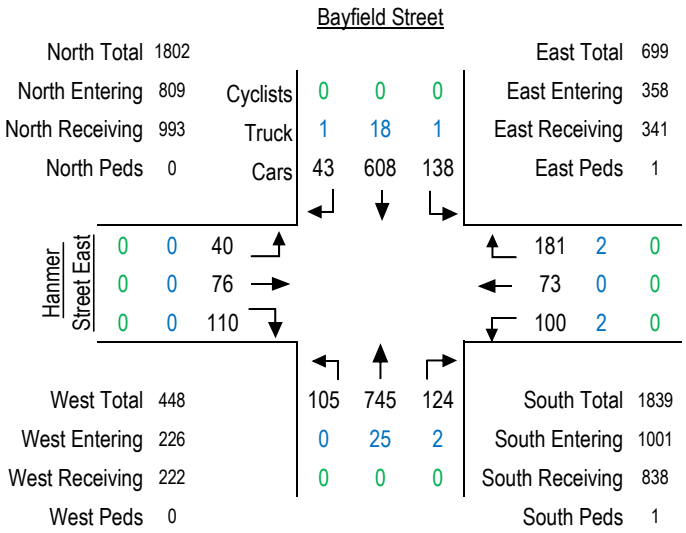
AM Peak Hour: 8:00 to 9:00



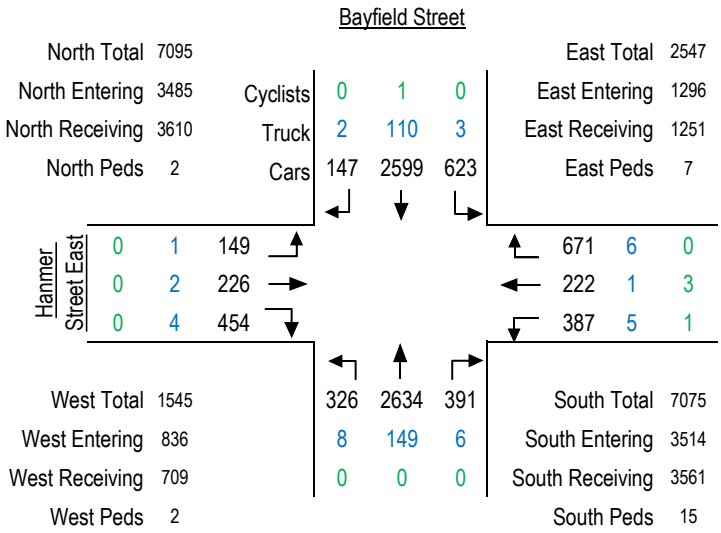
MD Peak Hour: - to -



PM Peak Hour: 16:00 to 17:00



Total 6-Hour Count



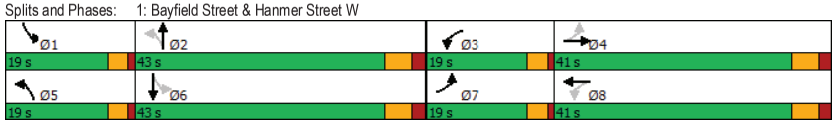
APPENDIX B

Capacity and Queuing Analysis Sheets

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	30	43	75	43	49	493	146	770
Future Volume (vph)	30	43	75	43	49	493	146	770
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	37.0	5.0	37.0
Minimum Split (s)	9.0	31.0	9.0	31.0	9.0	43.0	9.0	43.0
Total Split (s)	19.0	41.0	19.0	41.0	19.0	43.0	19.0	43.0
Total Split (%)	15.6%	33.6%	15.6%	33.6%	15.6%	35.2%	15.6%	35.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	17.5	10.1	20.9	13.5	45.9	37.3	50.6	41.5
Actuated g/C Ratio	0.21	0.12	0.25	0.16	0.56	0.45	0.62	0.51
v/c Ratio	0.11	0.35	0.25	0.28	0.13	0.28	0.29	0.35
Control Delay	23.1	14.3	24.7	12.6	7.8	15.1	8.4	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	14.3	24.7	12.6	7.8	15.1	8.4	14.1
LOS	C	B	C	B	A	B	A	B
Approach Delay		15.7		16.4		14.5		13.3
Approach LOS		B		B		B		B

Intersection Summary			
Cycle Length: 122			
Actuated Cycle Length: 82			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.35			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 70.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bayfield Street & Hanmer Street W



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	43	115	75	43	119	49	493	50	146	770	32
Future Volume (vph)	30	43	115	75	43	119	49	493	50	146	770	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.89		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3137		1802	3114		1719	4672		1787	4957	
Flt Permitted	0.64	1.00		0.51	1.00		0.31	1.00		0.38	1.00	
Satd. Flow (perm)	1181	3137		976	3114		567	4672		719	4957	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	47	125	82	47	129	53	536	54	159	837	35
RTOR Reduction (vph)	0	109	0	0	108	0	0	8	0	0	3	0
Lane Group Flow (vph)	33	63	0	82	68	0	53	582	0	159	869	0
Confl. Peds. (#/hr)	1		5	5		1	1		3	3		1
Heavy Vehicles (%)	3%	2%	1%	0%	0%	3%	5%	10%	3%	1%	4%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.0	10.8		20.4	13.5		43.5	38.2		50.1	41.5	
Effective Green, g (s)	15.0	10.8		20.4	13.5		43.5	38.2		50.1	41.5	
Actuated g/C Ratio	0.18	0.13		0.24	0.16		0.51	0.45		0.59	0.49	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	238	400		303	497		364	2112		534	2434	
v/s Ratio Prot	0.01	0.02		c0.02	0.02		0.01	0.12		c0.03	c0.18	
v/s Ratio Perm	0.02			c0.04			0.07			0.15		
v/c Ratio	0.14	0.16		0.27	0.14		0.15	0.28		0.30	0.36	
Uniform Delay, d1	29.1	32.8		25.5	30.5		10.3	14.5		7.8	13.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.5	0.1		0.2	0.3		0.3	0.4	
Delay (s)	29.4	33.0		26.0	30.6		10.4	14.8		8.1	13.7	
Level of Service	C	C		C	C		B	B		A	B	
Approach Delay (s)		32.4			29.1			14.5			12.8	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.35				
Actuated Cycle Length (s)	84.5	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	70.0%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	30	39	2	66	26	526	66	48	891	21
Future Volume (Veh/h)	0	2	30	39	2	66	26	526	66	48	891	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	2	34	44	2	75	30	598	75	55	1012	24
Pedestrians		9			1							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								139			212	
pX, platoon unblocked	0.93	0.93	0.92	0.93	0.93	0.98	0.92			0.98		
vC, conflicting volume	1478	1877	358	1179	1852	238	1045			674		
vC1, stage 1 conf vol	1143	1143		696	696							
vC2, stage 2 conf vol	335	734		482	1155							
vCu, unblocked vol	1096	1523	4	774	1496	139	749			585		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	97	89	99	91	96			94		
cM capacity (veh/h)	262	261	977	397	256	869	794			976		

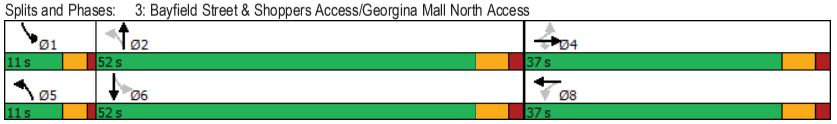
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	36	121	180	299	224	308	506	277
Volume Left	0	44	30	0	0	55	0	0
Volume Right	34	75	0	0	75	0	0	24
cSH	848	590	794	1700	1700	976	1700	1700
Volume to Capacity	0.04	0.21	0.04	0.18	0.13	0.06	0.30	0.16
Queue Length 95th (m)	1.1	6.1	0.9	0.0	0.0	1.4	0.0	0.0
Control Delay (s)	9.4	12.7	2.0	0.0	0.0	2.1	0.0	0.0
Lane LOS	A	B	A			A		
Approach Delay (s)	9.4	12.7	0.5			0.6		
Approach LOS	A	B						

Intersection Summary								
Average Delay			1.5					
Intersection Capacity Utilization			Err%		ICU Level of Service			H
Analysis Period (min)			15					

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	22	5	43	10	3	56	595	27	898
Future Volume (vph)	22	5	43	10	3	56	595	27	898
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	11.0	30.0	11.0	30.0
Total Split (s)	37.0	37.0	37.0	37.0	37.0	11.0	52.0	11.0	52.0
Total Split (%)	37.0%	37.0%	37.0%	37.0%	37.0%	11.0%	52.0%	11.0%	52.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	4.0	6.0	4.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		10.0	10.0		10.0	59.0	55.7	57.5	51.4
Actuated g/C Ratio		0.13	0.13		0.13	0.77	0.72	0.75	0.67
v/c Ratio		0.17	0.18		0.07	0.15	0.21	0.05	0.33
Control Delay		33.5	5.6		26.2	3.5	5.6	2.9	7.9
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		33.5	5.6		26.2	3.5	5.6	2.9	7.9
LOS		C	A		C	A	A	A	A
Approach Delay		16.5			26.2		5.4		7.8
Approach LOS		B			C		A		A

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 77			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 7.4		Intersection LOS: A	
Intersection Capacity Utilization 51.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Bayfield Street & Shoppers Access/Georgina Mall North Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	5	43	10	3	4	56	595	17	27	898	35
Future Volume (vph)	22	5	43	10	3	4	56	595	17	27	898	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		4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1826	1615		2782		1735	4666		1805	4917	
Flt Permitted		0.75	1.00		0.80		0.23	1.00		0.37	1.00	
Satd. Flow (perm)		1428	1615		2288		417	4666		702	4917	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	26	6	50	12	3	5	65	692	20	31	1044	41
RTOR Reduction (vph)	0	0	45	0	5	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	32	5	0	15	0	65	710	0	31	1082	0
Confl. Peds. (#/hr)							7					7
Heavy Vehicles (%)	0%	0%	0%	25%	0%	25%	4%	11%	0%	0%	5%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		7.7	7.7		7.7		59.7	54.3		54.3	51.6	
Effective Green, g (s)		7.7	7.7		7.7		59.7	54.3		54.3	51.6	
Actuated g/C Ratio		0.10	0.10		0.10		0.74	0.67		0.67	0.64	
Clearance Time (s)		6.0	6.0		6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		136	154		218		396	3139		509	3143	
v/s Ratio Prot							c0.01	0.15		0.00	c0.22	
v/s Ratio Perm		c0.02	0.00		0.01		0.11			0.04		
v/c Ratio		0.24	0.03		0.07		0.16	0.23		0.06	0.34	
Uniform Delay, d1		33.8	33.1		33.2		3.0	5.1		4.4	6.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9	0.1		0.1		0.2	0.2		0.1	0.3	
Delay (s)		34.7	33.2		33.4		3.2	5.3		4.4	7.0	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		33.8			33.4			5.1			7.0	
Approach LOS		C			C			A			A	

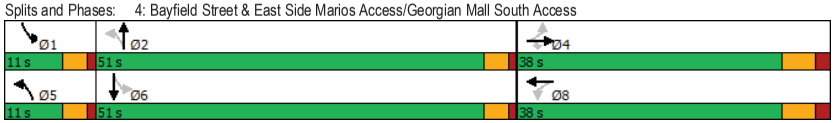
Intersection Summary				
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	80.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	51.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	70	10	23	9	3	22	599	11	905
Future Volume (vph)	70	10	23	9	3	22	599	11	905
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	35.0	35.0	35.0	35.0	35.0	11.0	30.0	11.0	30.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0	11.0	51.0	11.0	51.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	38.0%	11.0%	51.0%	11.0%	51.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		11.4	11.4	11.4	11.4	56.5	56.2	55.8	54.1
Actuated g/C Ratio		0.15	0.15	0.15	0.15	0.75	0.75	0.74	0.72
v/c Ratio		0.44	0.09	0.05	0.02	0.06	0.19	0.02	0.29
Control Delay		37.5	3.0	28.7	23.0	3.7	4.6	3.6	6.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		37.5	3.0	28.7	23.0	3.7	4.6	3.6	6.1
LOS		D	A	C	C	A	A	A	A
Approach Delay		29.8			26.5		4.6		6.1
Approach LOS		C			C		A		A

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 75.1			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 51.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Bayfield Street & East Side Marios Access/Georgian Mall South Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	10	23	9	3	3	22	599	49	11	905	35
Future Volume (vph)	70	10	23	9	3	3	22	599	49	11	905	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	6.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1684	1468	1805	1745		1626	4895		1805	4963	
Flt Permitted		0.75	1.00	0.70	1.00		0.25	1.00		0.37	1.00	
Satd. Flow (perm)		1316	1468	1331	1745		425	4895		708	4963	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	11	25	10	3	3	24	651	53	12	984	38
RTOR Reduction (vph)	0	0	22	0	3	0	0	6	0	0	3	0
Lane Group Flow (vph)	0	87	3	10	3	0	24	698	0	12	1019	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	9%	0%	10%	0%	0%	0%	11%	5%	2%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		9.1	9.1	9.1	9.1		57.9	55.3		55.3	54.0	
Effective Green, g (s)		9.1	9.1	9.1	9.1		57.9	55.3		55.3	54.0	
Actuated g/C Ratio		0.11	0.11	0.11	0.11		0.73	0.69		0.69	0.68	
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		150	167	151	199		347	3396		509	3362	
v/s Ratio Prot					0.00		c0.00	0.14		0.00	c0.21	
v/s Ratio Perm		c0.07	0.00	0.01			0.05			0.02		
v/c Ratio		0.58	0.02	0.07	0.02		0.07	0.21		0.02	0.30	
Uniform Delay, d1		33.5	31.3	31.5	31.3		3.1	4.4		3.8	5.2	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.4	0.0	0.2	0.0		0.1	0.1		0.0	0.2	
Delay (s)		38.8	31.4	31.7	31.4		3.2	4.5		3.8	5.4	
Level of Service		D	C	C	C		A	A		A	A	
Approach Delay (s)		37.2			31.6			4.5			5.4	
Approach LOS		D			C			A			A	

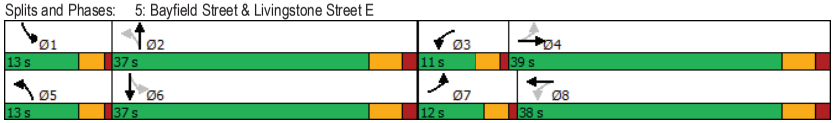
Intersection Summary				
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	51.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	94	152	139	153	81	606	74	850
Future Volume (vph)	94	152	139	153	81	606	74	850
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	11.0	38.0	11.0	38.0	11.0	30.0	11.0	30.0
Total Split (s)	12.0	39.0	11.0	38.0	13.0	37.0	13.0	37.0
Total Split (%)	12.0%	39.0%	11.0%	38.0%	13.0%	37.0%	13.0%	37.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	21.1	11.4	20.6	13.2	39.4	31.4	39.0	31.2
Actuated g/C Ratio	0.28	0.15	0.28	0.18	0.53	0.42	0.52	0.42
v/c Ratio	0.26	0.43	0.43	0.37	0.26	0.37	0.19	0.48
Control Delay	21.2	22.1	24.3	24.3	9.6	15.7	8.6	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	22.1	24.3	24.3	9.6	15.7	8.6	17.5
LOS	C	C	C	C	A	B	A	B
Approach Delay		21.8		24.3		15.1		16.9
Approach LOS		C		C		B		B

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 74.8			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 62.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Bayfield Street & Livingstone Street E



HCM Signalized Intersection Capacity Analysis <Existing> Weekday AM Peak
5: Bayfield Street & Livingstone Street E 03-16-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	152	76	139	153	59	81	606	98	74	850	54
Future Volume (vph)	94	152	76	139	153	59	81	606	98	74	850	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1799	3345		1768	3224		1640	4855		1735	4897	
Flt Permitted	0.61	1.00		0.56	1.00		0.23	1.00		0.33	1.00	
Satd. Flow (perm)	1152	3345		1037	3224		397	4855		595	4897	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	165	83	151	166	64	88	659	107	80	924	59
RTOR Reduction (vph)	0	70	0	0	49	0	0	19	0	0	6	0
Lane Group Flow (vph)	102	178	0	151	181	0	88	747	0	80	977	0
Confl. Peds. (#/hr)	11		4	4		11	14		1	1		14
Heavy Vehicles (%)	0%	3%	0%	2%	7%	6%	10%	4%	7%	4%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.4	12.3		20.2	13.2		37.4	31.4		37.0	31.2	
Effective Green, g (s)	18.4	12.3		20.2	13.2		37.4	31.4		37.0	31.2	
Actuated g/C Ratio	0.24	0.16		0.26	0.17		0.49	0.41		0.48	0.41	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	328	537		340	556		291	1992		374	1997	
v/s Ratio Prot	0.02	0.05		c0.04	0.06		c0.02	0.15		0.02	c0.20	
v/s Ratio Perm	0.05			c0.08			0.12			0.09		
v/c Ratio	0.31	0.33		0.44	0.33		0.30	0.38		0.21	0.49	
Uniform Delay, d1	23.4	28.5		22.7	27.7		10.8	15.7		10.7	16.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.4		0.9	0.3		0.6	0.5		0.3	0.9	
Delay (s)	23.9	28.8		23.6	28.1		11.4	16.3		11.0	17.6	
Level of Service	C	C		C	C		B	B		B	B	
Approach Delay (s)		27.4			26.3			15.8			17.1	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			

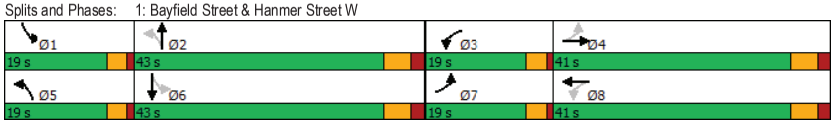
c Critical Lane Group

Timings <Existing> Weekday PM Peak
1: Bayfield Street & Hanmer Street W 03-16-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	40	76	113	73	132	995	139	786
Future Volume (vph)	40	76	113	73	132	995	139	786
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	37.0	5.0	37.0
Minimum Split (s)	9.0	31.0	9.0	31.0	9.0	43.0	9.0	43.0
Total Split (s)	19.0	41.0	19.0	41.0	19.0	43.0	19.0	43.0
Total Split (%)	15.6%	33.6%	15.6%	33.6%	15.6%	35.2%	15.6%	35.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	19.2	10.2	25.7	17.2	47.7	37.1	48.5	37.5
Actuated g/C Ratio	0.22	0.12	0.30	0.20	0.55	0.43	0.56	0.44
v/c Ratio	0.14	0.44	0.33	0.35	0.34	0.57	0.47	0.41
Control Delay	23.4	17.7	25.6	12.1	10.2	20.1	13.0	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	17.7	25.6	12.1	10.2	20.1	13.0	17.8
LOS	C	B	C	B	B	C	B	B
Approach Delay		18.6		16.2		19.1		17.1
Approach LOS		B		B		B		B

Intersection Summary			
Cycle Length: 122			
Actuated Cycle Length: 86.2			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bayfield Street & Hanmer Street W



HCM Signalized Intersection Capacity Analysis <Existing> Weekday PM Peak
1: Bayfield Street & Hanmer Street W 03-16-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	76	130	113	73	183	132	995	153	139	786	44
Future Volume (vph)	40	76	130	113	73	183	132	995	153	139	786	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.89		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1804	3233		1767	3171		1805	4932		1787	4995	
Flt Permitted	0.58	1.00		0.46	1.00		0.27	1.00		0.15	1.00	
Satd. Flow (perm)	1109	3233		856	3171		515	4932		287	4995	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	43	81	138	120	78	195	140	1059	163	148	836	47
RTOR Reduction (vph)	0	119	0	0	157	0	0	14	0	0	4	0
Lane Group Flow (vph)	43	100	0	120	116	0	140	1208	0	148	879	0
Confl. Peds. (#/hr)	1		5	5		1	1		3	3		1
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%	0%	3%	2%	1%	3%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.5	11.9		25.8	17.2		45.7	37.1		46.5	37.5	
Effective Green, g (s)	16.5	11.9		25.8	17.2		45.7	37.1		46.5	37.5	
Actuated g/C Ratio	0.19	0.14		0.29	0.20		0.52	0.42		0.53	0.43	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	244	437		353	620		393	2081		305	2130	
v/s Ratio Prot	0.01	0.03		c0.04	0.04		0.03	c0.24		c0.05	0.18	
v/s Ratio Perm	0.02			c0.06			0.15			0.21		
v/c Ratio	0.18	0.23		0.34	0.19		0.36	0.58		0.49	0.41	
Uniform Delay, d1	29.7	33.9		23.6	29.5		11.1	19.4		11.8	17.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.3		0.6	0.1		0.6	1.2		1.2	0.6	
Delay (s)	30.1	34.2		24.2	29.7		11.7	20.6		13.0	18.1	
Level of Service	C	C		C	C		B	C		B	B	
Approach Delay (s)		33.5			28.0			19.7			17.4	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis <Existing> Weekday PM Peak
2: Bayfield Street & LCBO Access/Site Access 03-16-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	59	19	1	55	37	1225	54	22	944	63
Future Volume (Veh/h)	0	0	59	19	1	55	37	1225	54	22	944	63
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	62	20	1	58	39	1289	57	23	994	66
Pedestrians		9			1							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								139			212	
pX, platoon unblocked	0.95	0.95	0.91	0.95	0.95	0.90	0.91			0.90		
vC, conflicting volume	1648	2507	373	1836	2512	459	1069			1347		
vC1, stage 1 conf vol	1082	1082		1396	1396							
vC2, stage 2 conf vol	566	1425		439	1115							
vCu, unblocked vol	816	1722	0	1014	1727	11	710			997		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	94	90	100	94	95			96		
cM capacity (veh/h)	322	203	980	205	211	966	807			631		

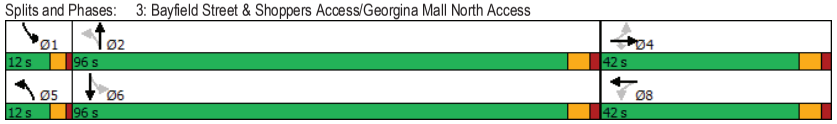
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	62	79	361	644	379	272	497	314
Volume Left	0	20	39	0	0	23	0	0
Volume Right	62	58	0	0	57	0	0	66
cSH	980	487	807	1700	1700	631	1700	1700
Volume to Capacity	0.06	0.16	0.05	0.38	0.22	0.04	0.29	0.18
Queue Length 95th (m)	1.6	4.6	1.2	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	8.9	13.8	1.6	0.0	0.0	1.4	0.0	0.0
Lane LOS	A	B	A			A		
Approach Delay (s)	8.9	13.8	0.4			0.3		
Approach LOS	A	B						

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	60.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	70	9	90	95	11	116	1177	74	916
Future Volume (vph)	70	9	90	95	11	116	1177	74	916
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	11.0	30.0	11.0	30.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	12.0	96.0	12.0	96.0
Total Split (%)	28.0%	28.0%	28.0%	28.0%	28.0%	8.0%	64.0%	8.0%	64.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	4.0	6.0	4.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		14.9	14.9		14.9	99.8	90.3	99.3	90.1
Actuated g/C Ratio		0.12	0.12		0.12	0.78	0.70	0.77	0.70
v/c Ratio		0.65	0.35		0.52	0.27	0.39	0.24	0.29
Control Delay		77.2	13.3		36.0	4.6	8.4	4.8	7.7
Queue Delay		0.0	0.0		0.0	0.0	0.4	0.0	0.0
Total Delay		77.2	13.3		36.0	4.6	8.8	4.8	7.7
LOS		E	B		D	A	A	A	A
Approach Delay		43.1			36.0		8.4		7.5
Approach LOS		D			D		A		A

Intersection Summary			
Cycle Length: 150			
Actuated Cycle Length: 128.5			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 56.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Bayfield Street & Shoppers Access/Georgina Mall North Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	9	90	95	11	73	116	1177	101	74	916	37
Future Volume (vph)	70	9	90	95	11	73	116	1177	101	74	916	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.94		1.00	0.99		1.00	0.99	
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1820	1615		3237		1804	4980		1805	5008	
Flt Permitted		0.59	1.00		0.78		0.26	1.00		0.17	1.00	
Satd. Flow (perm)		1118	1615		2585		490	4980		325	5008	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	74	10	96	101	12	78	123	1252	107	79	974	39
RTOR Reduction (vph)	0	0	85	0	69	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	84	11	0	122	0	123	1354	0	79	1011	0
Confl. Peds. (#/hr)							7					7
Heavy Vehicles (%)	0%	0%	0%	3%	0%	1%	0%	3%	2%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		14.9	14.9		14.9		97.9	90.4		97.3	90.1	
Effective Green, g (s)		14.9	14.9		14.9		97.9	90.4		97.3	90.1	
Actuated g/C Ratio		0.12	0.12		0.12		0.76	0.70		0.76	0.70	
Clearance Time (s)		6.0	6.0		6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		129	187		299		450	3503		329	3511	
v/s Ratio Prot							c0.02	c0.27		0.01	0.20	
v/s Ratio Perm		c0.08	0.01		0.05		0.19			0.17		
v/c Ratio		0.65	0.06		0.41		0.27	0.39		0.24	0.29	
Uniform Delay, d1		54.3	50.6		52.7		4.0	7.8		4.3	7.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.2	0.1		0.9		0.3	0.3		0.4	0.2	
Delay (s)		65.5	50.7		53.6		4.3	8.1		4.7	7.4	
Level of Service		E	D		D		A	A		A	A	
Approach Delay (s)		57.6			53.6			7.8			7.2	
Approach LOS		E			D			A			A	

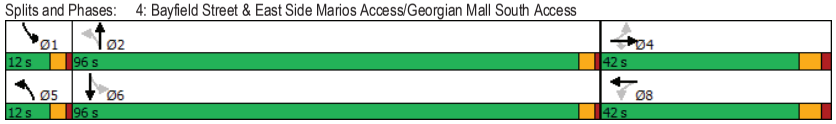
Intersection Summary					
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.41				
Actuated Cycle Length (s)	128.5	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	234	44	81	108	24	122	1102	25	953
Future Volume (vph)	234	44	81	108	24	122	1102	25	953
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	35.0	35.0	35.0	35.0	35.0	11.0	30.0	11.0	30.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	12.0	96.0	12.0	96.0
Total Split (%)	28.0%	28.0%	28.0%	28.0%	28.0%	8.0%	64.0%	8.0%	64.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		36.0	36.0	36.0	36.0	102.1	97.3	99.0	92.0
Actuated g/C Ratio		0.24	0.24	0.24	0.24	0.68	0.65	0.66	0.61
v/c Ratio		0.98	0.20	0.79	0.17	0.43	0.42	0.09	0.37
Control Delay		102.1	9.8	89.2	19.8	12.3	13.3	8.0	14.5
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay		102.1	9.8	89.2	19.8	12.3	13.3	8.0	15.0
LOS		F	A	F	B	B	B	A	B
Approach Delay		81.3			62.1		13.2		14.9
Approach LOS		F			E		B		B

Intersection Summary			
Cycle Length: 150			
Actuated Cycle Length: 149.9			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 24.7		Intersection LOS: C	
Intersection Capacity Utilization 64.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Bayfield Street & East Side Marios Access/Georgian Mall South Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	234	44	81	108	24	46	122	1102	166	25	953	123
Future Volume (vph)	234	44	81	108	24	46	122	1102	166	25	953	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.90		1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1689	1468	1805	1694		1626	4861		1805	4911	
Flt Permitted		0.71	1.00	0.32	1.00		0.20	1.00		0.17	1.00	
Satd. Flow (perm)		1248	1468	602	1694		338	4861		318	4911	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	246	46	85	114	25	48	128	1160	175	26	1003	129
RTOR Reduction (vph)	0	0	65	0	37	0	0	13	0	0	11	0
Lane Group Flow (vph)	0	292	20	114	36	0	128	1322	0	26	1121	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	9%	0%	10%	0%	0%	0%	11%	5%	2%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		36.0	36.0	36.0	36.0		105.2	97.3		97.8	93.6	
Effective Green, g (s)		36.0	36.0	36.0	36.0		105.2	97.3		97.8	93.6	
Actuated g/C Ratio		0.24	0.24	0.24	0.24		0.69	0.64		0.65	0.62	
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		296	348	143	402		301	3121		246	3034	
v/s Ratio Prot					0.02		c0.02	0.27		0.00	0.23	
v/s Ratio Perm		c0.23	0.01	0.19			c0.27			0.07		
v/c Ratio		0.99	0.06	0.80	0.09		0.43	0.42		0.11	0.37	
Uniform Delay, d1		57.5	44.6	54.3	45.0		9.1	13.3		10.2	14.3	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		48.2	0.1	25.7	0.1		1.0	0.4		0.2	0.3	
Delay (s)		105.7	44.7	80.0	45.1		10.0	13.7		10.4	14.7	
Level of Service		F	D	F	D		B	B		B	B	
Approach Delay (s)		91.9			66.4			13.4			14.6	
Approach LOS		F			E			B			B	

Intersection Summary					
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.58				
Actuated Cycle Length (s)	151.5	Sum of lost time (s)	14.0		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	180	272	302	298	166	1214	138	966
Future Volume (vph)	180	272	302	298	166	1214	138	966
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	11.0	38.0	11.0	38.0	14.0	30.0	14.0	30.0
Total Split (s)	26.0	43.0	21.0	38.0	20.0	66.0	20.0	66.0
Total Split (%)	17.3%	28.7%	14.0%	25.3%	13.3%	44.0%	13.3%	44.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	39.3	21.2	40.5	21.9	74.3	60.6	74.1	60.5
Actuated g/C Ratio	0.30	0.16	0.31	0.17	0.57	0.46	0.57	0.46
v/c Ratio	0.60	0.71	0.95	0.69	0.58	0.72	0.67	0.52
Control Delay	40.4	53.5	73.6	55.7	20.6	30.6	40.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	53.5	73.6	55.7	20.6	30.6	40.0	26.3
LOS	D	D	E	E	C	C	D	C
Approach Delay		49.3		63.6		29.7		27.9
Approach LOS		D		E		C		C

Intersection Summary			
Cycle Length: 150			
Actuated Cycle Length: 130.4			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 37.4		Intersection LOS: D	
Intersection Capacity Utilization 84.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 5: Bayfield Street & Livingstone Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	272	110	302	298	82	166	1214	311	138	966	114
Future Volume (vph)	180	272	110	302	298	82	166	1214	311	138	966	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1784	3437		1930	3474		1786	4888		1805	4869	
Flt Permitted	0.31	1.00		0.28	1.00		0.17	1.00		0.07	1.00	
Satd. Flow (perm)	588	3437		533	3474		317	4888		134	4869	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	296	120	328	324	89	180	1320	338	150	1050	124
RTOR Reduction (vph)	0	33	0	0	17	0	0	27	0	0	9	0
Lane Group Flow (vph)	196	383	0	328	396	0	180	1631	0	150	1165	0
Confl. Peds. (#/hr)	11		4	4		11	14		1	1		14
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	3%	1%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.5	21.2		38.9	21.9		72.2	60.6		72.0	60.5	
Effective Green, g (s)	37.5	21.2		38.9	21.9		72.2	60.6		72.0	60.5	
Actuated g/C Ratio	0.29	0.16		0.30	0.17		0.55	0.47		0.55	0.46	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	559		341	583		306	2273		221	2260	
v/s Ratio Prot	0.08	0.11		c0.13	0.11		0.05	c0.33		c0.06	0.24	
v/s Ratio Perm	0.10			c0.16			0.27			0.31		
v/c Ratio	0.62	0.69		0.96	0.68		0.59	0.72		0.68	0.52	
Uniform Delay, d1	37.4	51.4		40.2	50.9		16.1	28.0		25.0	24.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	3.5		38.5	3.1		2.9	2.0		8.0	0.8	
Delay (s)	41.0	54.9		78.7	54.0		19.0	30.0		33.0	25.4	
Level of Service	D	D		E	D		B	C		C	C	
Approach Delay (s)		50.4			64.9			28.9			26.3	
Approach LOS		D			E			C			C	

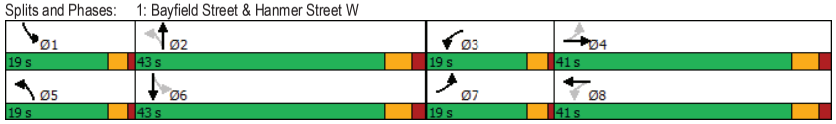
Intersection Summary					
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.80				
Actuated Cycle Length (s)	130.3	Sum of lost time (s)	20.0		
Intersection Capacity Utilization	84.6%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	34	49	86	49	56	566	168	884
Future Volume (vph)	34	49	86	49	56	566	168	884
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	37.0	5.0	37.0
Minimum Split (s)	9.0	31.0	9.0	31.0	9.0	43.0	9.0	43.0
Total Split (s)	19.0	41.0	19.0	41.0	19.0	43.0	19.0	43.0
Total Split (%)	15.6%	33.6%	15.6%	33.6%	15.6%	35.2%	15.6%	35.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	17.7	10.1	21.5	13.8	46.1	37.3	51.6	42.0
Actuated g/C Ratio	0.21	0.12	0.26	0.17	0.55	0.45	0.62	0.51
v/c Ratio	0.13	0.39	0.28	0.32	0.17	0.32	0.35	0.40
Control Delay	23.6	14.5	25.4	12.4	8.3	16.0	9.1	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	14.5	25.4	12.4	8.3	16.0	9.1	14.9
LOS	C	B	C	B	A	B	A	B
Approach Delay		15.9		16.5		15.4		14.0
Approach LOS		B		B		B		B

Intersection Summary			
Cycle Length: 122			
Actuated Cycle Length: 83.1			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 14.9		Intersection LOS: B	
Intersection Capacity Utilization 71.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bayfield Street & Hanmer Street W



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	49	132	86	49	137	56	566	57	168	884	37
Future Volume (vph)	34	49	132	86	49	137	56	566	57	168	884	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.89		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3135		1802	3111		1719	4672		1787	4957	
Flt Permitted	0.62	1.00		0.49	1.00		0.26	1.00		0.33	1.00	
Satd. Flow (perm)	1152	3135		933	3111		478	4672		628	4957	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	53	143	93	53	149	61	615	62	183	961	40
RTOR Reduction (vph)	0	125	0	0	125	0	0	8	0	0	3	0
Lane Group Flow (vph)	37	71	0	93	77	0	61	669	0	183	998	0
Confl. Peds. (#/hr)	1		5	5		1	1		3	3		1
Heavy Vehicles (%)	3%	2%	1%	0%	0%	3%	5%	10%	3%	1%	4%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.1	10.8		21.1	13.8		43.7	38.2		51.3	42.0	
Effective Green, g (s)	15.1	10.8		21.1	13.8		43.7	38.2		51.3	42.0	
Actuated g/C Ratio	0.18	0.13		0.25	0.16		0.51	0.45		0.60	0.49	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	233	395		304	501		323	2084		502	2432	
v/s Ratio Prot	0.01	0.02		c0.03	0.02		0.01	0.14		c0.04	c0.20	
v/s Ratio Perm	0.02			c0.05			0.08			0.18		
v/c Ratio	0.16	0.18		0.31	0.15		0.19	0.32		0.36	0.41	
Uniform Delay, d1	29.7	33.4		25.7	30.9		10.6	15.3		7.9	13.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.6	0.1		0.3	0.4		0.5	0.5	
Delay (s)	30.0	33.7		26.3	31.0		10.9	15.7		8.3	14.4	
Level of Service	C	C		C	C		B	B		A	B	
Approach Delay (s)		33.1			29.5			15.3			13.5	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.41				
Actuated Cycle Length (s)	85.6	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	71.8%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	34	45	2	76	30	604	76	55	1023	24
Future Volume (Veh/h)	0	2	34	45	2	76	30	604	76	55	1023	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	2	39	51	2	86	34	686	86	62	1162	27
Pedestrians		9			1							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								139			212	
pX, platoon unblocked	0.92	0.92	0.90	0.92	0.92	0.96	0.90			0.96		
vC, conflicting volume	1692	2150	410	1349	2120	273	1198			773		
vC1, stage 1 conf vol	1308	1308		798	798							
vC2, stage 2 conf vol	384	841		551	1322							
vCu, unblocked vol	1130	1628	0	756	1596	88	815			610		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	96	86	99	91	95			93		
cM capacity (veh/h)	228	231	956	376	222	918	730			937		

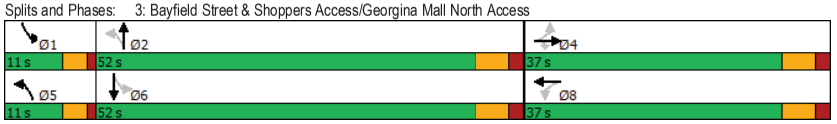
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	41	139	206	343	258	352	581	318
Volume Left	0	51	34	0	0	62	0	0
Volume Right	39	86	0	0	86	0	0	27
cSH	829	584	730	1700	1700	937	1700	1700
Volume to Capacity	0.05	0.24	0.05	0.20	0.15	0.07	0.34	0.19
Queue Length 95th (m)	1.2	7.4	1.2	0.0	0.0	1.7	0.0	0.0
Control Delay (s)	9.6	13.1	2.1	0.0	0.0	2.2	0.0	0.0
Lane LOS	A	B	A			A		
Approach Delay (s)	9.6	13.1	0.5			0.6		
Approach LOS	A	B						

Intersection Summary								
Average Delay			1.5					
Intersection Capacity Utilization			59.4%		ICU Level of Service			B
Analysis Period (min)			15					

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	25	6	49	11	3	64	683	31	1032
Future Volume (vph)	25	6	49	11	3	64	683	31	1032
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	11.0	30.0	11.0	30.0
Total Split (s)	37.0	37.0	37.0	37.0	37.0	11.0	52.0	11.0	52.0
Total Split (%)	37.0%	37.0%	37.0%	37.0%	37.0%	11.0%	52.0%	11.0%	52.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	4.0	6.0	4.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		10.0	10.0		10.0	57.8	53.1	57.1	51.0
Actuated g/C Ratio		0.13	0.13		0.13	0.75	0.69	0.75	0.67
v/c Ratio		0.19	0.21		0.07	0.19	0.25	0.06	0.38
Control Delay		33.8	7.4		25.7	3.9	6.7	2.9	8.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		33.8	7.4		25.7	3.9	6.7	2.9	8.4
LOS		C	A		C	A	A	A	A
Approach Delay		17.6			25.7		6.5		8.2
Approach LOS		B			C		A		A

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 76.6			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.38			
Intersection Signal Delay: 8.1		Intersection LOS: A	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Bayfield Street & Shoppers Access/Georgina Mall North Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	6	49	11	3	5	64	683	20	31	1032	40
Future Volume (vph)	25	6	49	11	3	5	64	683	20	31	1032	40
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		4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1826	1615		2766		1735	4666		1805	4917	
Flt Permitted		0.75	1.00		0.80		0.19	1.00		0.33	1.00	
Satd. Flow (perm)		1429	1615		2272		348	4666		630	4917	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	29	7	57	13	3	6	74	794	23	36	1200	47
RTOR Reduction (vph)	0	0	51	0	5	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	36	6	0	17	0	74	815	0	36	1244	0
Confl. Peds. (#/hr)							7					7
Heavy Vehicles (%)	0%	0%	0%	25%	0%	25%	4%	11%	0%	0%	5%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		7.8	7.8		7.8		57.2	51.8		54.6	50.5	
Effective Green, g (s)		7.8	7.8		7.8		57.2	51.8		54.6	50.5	
Actuated g/C Ratio		0.10	0.10		0.10		0.72	0.65		0.69	0.63	
Clearance Time (s)		6.0	6.0		6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		139	158		222		343	3032		492	3115	
v/s Ratio Prot							c0.01	0.17		0.00	c0.25	
v/s Ratio Perm		c0.03	0.00		0.01		0.14			0.05		
v/c Ratio		0.26	0.04		0.07		0.22	0.27		0.07	0.40	
Uniform Delay, d1		33.3	32.5		32.7		3.5	5.9		4.0	7.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0	0.1		0.1		0.3	0.2		0.1	0.4	
Delay (s)		34.3	32.6		32.8		3.8	6.1		4.1	7.5	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		33.3			32.8			5.9			7.4	
Approach LOS		C			C			A			A	

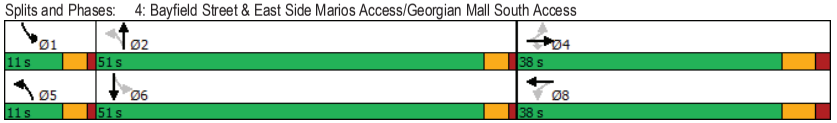
Intersection Summary				
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	80	11	26	10	3	25	688	13	1040
Future Volume (vph)	80	11	26	10	3	25	688	13	1040
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	35.0	35.0	35.0	35.0	35.0	11.0	30.0	11.0	30.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0	11.0	51.0	11.0	51.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	38.0%	11.0%	51.0%	11.0%	51.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		12.0	12.0	12.0	12.0	55.5	55.2	54.8	53.2
Actuated g/C Ratio		0.16	0.16	0.16	0.16	0.74	0.74	0.73	0.71
v/c Ratio		0.47	0.10	0.05	0.02	0.07	0.22	0.02	0.33
Control Delay		37.5	3.7	28.3	22.7	4.2	5.0	3.9	6.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		37.5	3.7	28.3	22.7	4.2	5.0	3.9	6.7
LOS		D	A	C	C	A	A	A	A
Approach Delay		30.0			26.3		5.0		6.7
Approach LOS		C			C		A		A

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 74.7			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 7.6		Intersection LOS: A	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Bayfield Street & East Side Marios Access/Georgian Mall South Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	11	26	10	3	3	25	688	56	13	1040	40
Future Volume (vph)	80	11	26	10	3	3	25	688	56	13	1040	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1683	1468	1805	1745		1626	4895		1805	4963	
Flt Permitted		0.75	1.00	0.69	1.00		0.21	1.00		0.33	1.00	
Satd. Flow (perm)		1314	1468	1317	1745		352	4895		635	4963	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	12	28	11	3	3	27	748	61	14	1130	43
RTOR Reduction (vph)	0	0	25	0	3	0	0	6	0	0	3	0
Lane Group Flow (vph)	0	99	3	11	3	0	27	803	0	14	1170	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	9%	0%	10%	0%	0%	0%	11%	5%	2%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		9.7	9.7	9.7	9.7		56.8	54.3		54.2	53.0	
Effective Green, g (s)		9.7	9.7	9.7	9.7		56.8	54.3		54.2	53.0	
Actuated g/C Ratio		0.12	0.12	0.12	0.12		0.72	0.69		0.68	0.67	
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		160	179	161	213		292	3356		452	3321	
v/s Ratio Prot					0.00		c0.00	0.16		0.00	c0.24	
v/s Ratio Perm		c0.08	0.00	0.01			0.06			0.02		
v/c Ratio		0.62	0.02	0.07	0.02		0.09	0.24		0.03	0.35	
Uniform Delay, d1		33.0	30.6	30.8	30.6		3.4	4.7		4.0	5.7	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.9	0.0	0.2	0.0		0.1	0.2		0.0	0.3	
Delay (s)		39.9	30.6	30.9	30.6		3.6	4.9		4.0	6.0	
Level of Service		D	C	C	C		A	A		A	A	
Approach Delay (s)		37.9			30.8			4.8			5.9	
Approach LOS		D			C			A			A	

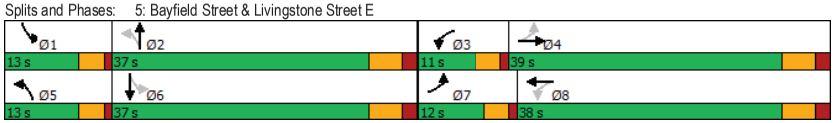
Intersection Summary				
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	79.2	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	108	175	160	176	93	696	85	976
Future Volume (vph)	108	175	160	176	93	696	85	976
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	11.0	38.0	11.0	38.0	11.0	30.0	11.0	30.0
Total Split (s)	12.0	39.0	11.0	38.0	13.0	37.0	13.0	37.0
Total Split (%)	12.0%	39.0%	11.0%	38.0%	13.0%	37.0%	13.0%	37.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	21.8	11.9	21.2	13.7	39.6	31.4	39.3	31.2
Actuated g/C Ratio	0.29	0.16	0.28	0.18	0.52	0.42	0.52	0.41
v/c Ratio	0.30	0.47	0.50	0.42	0.34	0.43	0.24	0.56
Control Delay	21.5	22.6	25.9	25.4	11.2	16.8	9.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	22.6	25.9	25.4	11.2	16.8	9.5	18.9
LOS	C	C	C	C	B	B	A	B
Approach Delay		22.3		25.6		16.2		18.2
Approach LOS		C		C		B		B

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 75.6			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 19.2		Intersection LOS: B	
Intersection Capacity Utilization 62.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Bayfield Street & Livingstone Street E



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	175	87	160	176	68	93	696	113	85	976	62
Future Volume (vph)	108	175	87	160	176	68	93	696	113	85	976	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1799	3346		1768	3223		1640	4855		1735	4897	
Flt Permitted	0.59	1.00		0.54	1.00		0.18	1.00		0.27	1.00	
Satd. Flow (perm)	1114	3346		1003	3223		310	4855		498	4897	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	190	95	174	191	74	101	757	123	92	1061	67
RTOR Reduction (vph)	0	78	0	0	49	0	0	19	0	0	6	0
Lane Group Flow (vph)	117	207	0	174	216	0	101	861	0	92	1122	0
Confl. Peds. (#/hr)	11		4	4		11	14		1	1		14
Heavy Vehicles (%)	0%	3%	0%	2%	7%	6%	10%	4%	7%	4%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.0	12.8		20.8	13.7		37.6	31.4		37.2	31.2	
Effective Green, g (s)	19.0	12.8		20.8	13.7		37.6	31.4		37.2	31.2	
Actuated g/C Ratio	0.25	0.17		0.27	0.18		0.49	0.41		0.48	0.40	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	328	554		340	571		257	1972		335	1976	
v/s Ratio Prot	0.03	0.06		c0.05	0.07		c0.03	0.18		0.02	c0.23	
v/s Ratio Perm	0.06			c0.09			0.16			0.11		
v/c Ratio	0.36	0.37		0.51	0.38		0.39	0.44		0.27	0.57	
Uniform Delay, d1	23.5	28.7		22.9	28.0		11.4	16.6		11.1	17.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.4		1.3	0.4		1.0	0.7		0.4	1.2	
Delay (s)	24.2	29.1		24.2	28.5		12.4	17.3		11.5	19.0	
Level of Service	C	C		C	C		B	B		B	B	
Approach Delay (s)		27.7			26.8			16.8			18.5	
Approach LOS		C			C			B			B	

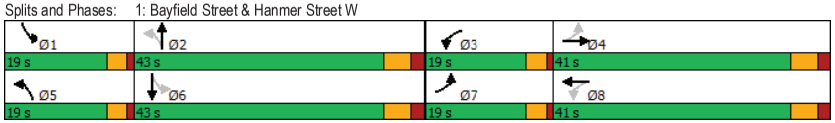
Intersection Summary				
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	46	87	130	84	152	1143	160	903
Future Volume (vph)	46	87	130	84	152	1143	160	903
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	37.0	5.0	37.0
Minimum Split (s)	9.0	31.0	9.0	31.0	9.0	43.0	9.0	43.0
Total Split (s)	19.0	41.0	19.0	41.0	19.0	43.0	19.0	43.0
Total Split (%)	15.6%	33.6%	15.6%	33.6%	15.6%	35.2%	15.6%	35.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	19.6	10.4	26.9	18.0	48.5	37.2	49.7	37.8
Actuated g/C Ratio	0.22	0.12	0.30	0.20	0.55	0.42	0.56	0.43
v/c Ratio	0.16	0.49	0.38	0.38	0.43	0.67	0.59	0.47
Control Delay	24.0	18.4	26.6	12.1	12.2	22.9	21.0	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	18.4	26.6	12.1	12.2	22.9	21.0	19.4
LOS	C	B	C	B	B	C	C	B
Approach Delay		19.3		16.6		21.8		19.6
Approach LOS		B		B		C		B

Intersection Summary			
Cycle Length: 122			
Actuated Cycle Length: 88.2			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 20.2		Intersection LOS: C	
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Bayfield Street & Hanmer Street W



HCM Signalized Intersection Capacity Analysis <Background 2030> Weekday PM Peak
1: Bayfield Street & Hanmer Street W 03-16-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	87	149	130	84	210	152	1143	176	160	903	51
Future Volume (vph)	46	87	149	130	84	210	152	1143	176	160	903	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.89		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1804	3233		1767	3170		1805	4932		1787	4995	
Flt Permitted	0.56	1.00		0.44	1.00		0.22	1.00		0.11	1.00	
Satd. Flow (perm)	1068	3233		820	3170		419	4932		199	4995	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	93	159	138	89	223	162	1216	187	170	961	54
RTOR Reduction (vph)	0	138	0	0	178	0	0	14	0	0	4	0
Lane Group Flow (vph)	49	114	0	138	134	0	162	1389	0	170	1011	0
Confl. Peds. (#/hr)	1		5	5		1	1		3	3		1
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%	0%	3%	2%	1%	3%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.8	12.1		26.7	18.0		46.4	37.2		47.8	37.9	
Effective Green, g (s)	16.8	12.1		26.7	18.0		46.4	37.2		47.8	37.9	
Actuated g/C Ratio	0.19	0.13		0.30	0.20		0.52	0.41		0.53	0.42	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	238	435		355	635		358	2043		280	2108	
v/s Ratio Prot	0.01	0.04		c0.05	0.04		0.05	c0.28		c0.07	0.20	
v/s Ratio Perm	0.03			c0.07			0.19			0.26		
v/c Ratio	0.21	0.26		0.39	0.21		0.45	0.68		0.61	0.48	
Uniform Delay, d1	30.5	34.9		24.2	30.0		11.9	21.4		13.6	18.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.3		0.7	0.2		0.9	1.8		3.7	0.8	
Delay (s)	30.9	35.2		24.9	30.1		12.8	23.3		17.3	19.6	
Level of Service	C	D		C	C		B	C		B	B	
Approach Delay (s)		34.5			28.5			22.2			19.3	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	89.8	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	73.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis <Background 2030> Weekday PM Peak
2: Bayfield Street & LCBO Access/Site Access 03-16-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	68	22	1	63	43	1407	62	25	1084	72
Future Volume (Veh/h)	0	0	68	22	1	63	43	1407	62	25	1084	72
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	72	23	1	66	45	1481	65	26	1141	76
Pedestrians		9			1							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								139			212	
pX, platoon unblocked	0.91	0.91	0.88	0.91	0.91	0.85	0.88			0.85		
vC, conflicting volume	1890	2877	427	2109	2882	527	1226			1547		
vC1, stage 1 conf vol	1240	1240		1604	1604							
vC2, stage 2 conf vol	650	1637		504	1278							
vCu, unblocked vol	737	1817	0	977	1823	0	768			1036		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	92	87	99	93	94			96		
cM capacity (veh/h)	289	174	950	179	184	929	745			578		

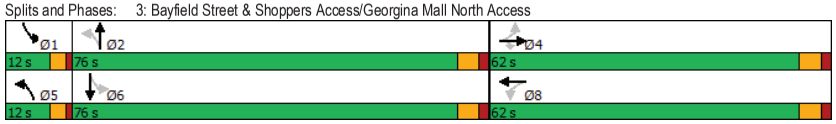
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	72	90	415	740	435	311	570	361
Volume Left	0	23	45	0	0	26	0	0
Volume Right	72	66	0	0	65	0	0	76
cSH	950	439	745	1700	1700	578	1700	1700
Volume to Capacity	0.08	0.21	0.06	0.44	0.26	0.04	0.34	0.21
Queue Length 95th (m)	2.0	6.1	1.5	0.0	0.0	1.1	0.0	0.0
Control Delay (s)	9.1	15.3	1.8	0.0	0.0	1.5	0.0	0.0
Lane LOS	A	C	A			A		
Approach Delay (s)	9.1	15.3	0.5			0.4		
Approach LOS	A	C						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	74.4%	ICU Level of Service	D	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	80	10	103	109	13	133	1352	85	1052
Future Volume (vph)	80	10	103	109	13	133	1352	85	1052
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	11.0	30.0	11.0	30.0
Total Split (s)	62.0	62.0	62.0	62.0	62.0	12.0	76.0	12.0	76.0
Total Split (%)	41.3%	41.3%	41.3%	41.3%	41.3%	8.0%	50.7%	8.0%	50.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	4.0	6.0	4.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		14.5	14.5		14.5	79.9	70.4	79.3	70.1
Actuated g/C Ratio		0.13	0.13		0.13	0.74	0.65	0.73	0.65
v/c Ratio		0.65	0.35		0.52	0.36	0.48	0.32	0.36
Control Delay		64.8	11.0		29.8	6.1	10.5	6.6	9.4
Queue Delay		0.0	0.0		0.0	0.0	0.3	0.0	0.0
Total Delay		64.8	11.0		29.8	6.1	10.8	6.6	9.4
LOS		E	B		C	A	B	A	A
Approach Delay		36.1			29.8		10.5		9.2
Approach LOS		D			C		B		A

Intersection Summary			
Cycle Length: 150			
Actuated Cycle Length: 108.1			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 12.8		Intersection LOS: B	
Intersection Capacity Utilization 60.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Bayfield Street & Shoppers Access/Georgina Mall North Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	10	103	109	13	84	133	1352	116	85	1052	43
Future Volume (vph)	80	10	103	109	13	84	133	1352	116	85	1052	43
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		4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.94		1.00	0.99		1.00	0.99	
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1819	1615		3238		1804	4980		1805	5008	
Flt Permitted		0.58	1.00		0.77		0.21	1.00		0.13	1.00	
Satd. Flow (perm)		1108	1615		2571		401	4980		242	5008	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	11	110	116	14	89	141	1438	123	90	1119	46
RTOR Reduction (vph)	0	0	95	0	77	0	0	4	0	0	2	0
Lane Group Flow (vph)	0	96	15	0	142	0	141	1557	0	90	1163	0
Confl. Peds. (#/hr)							7					7
Heavy Vehicles (%)	0%	0%	0%	3%	0%	1%	0%	3%	2%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		14.5	14.5		14.5		77.9	70.4		77.3	70.1	
Effective Green, g (s)		14.5	14.5		14.5		77.9	70.4		77.3	70.1	
Actuated g/C Ratio		0.13	0.13		0.13		0.72	0.65		0.72	0.65	
Clearance Time (s)		6.0	6.0		6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		148	216		344		386	3243		277	3247	
v/s Ratio Prot							c0.03	c0.31		0.02	0.23	
v/s Ratio Perm		c0.09	0.01		0.06		0.24			0.21		
v/c Ratio		0.65	0.07		0.41		0.37	0.48		0.32	0.36	
Uniform Delay, d1		44.4	40.9		42.9		4.8	9.6		5.5	8.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.4	0.1		0.8		0.6	0.5		0.7	0.3	
Delay (s)		53.8	41.0		43.7		5.4	10.1		6.2	9.0	
Level of Service		D	D		D		A	B		A	A	
Approach Delay (s)		47.0			43.7			9.7			8.8	
Approach LOS		D			D			A			A	

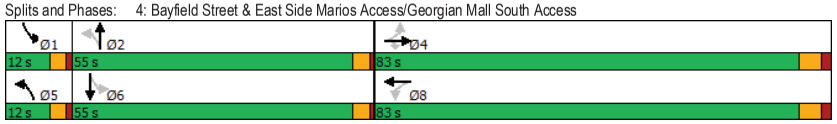
Intersection Summary					
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.50				
Actuated Cycle Length (s)	108.1	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	60.6%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	269	51	93	124	28	140	1266	29	1095
Future Volume (vph)	269	51	93	124	28	140	1266	29	1095
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	35.0	35.0	35.0	35.0	35.0	11.0	30.0	11.0	30.0
Total Split (s)	83.0	83.0	83.0	83.0	83.0	12.0	55.0	12.0	55.0
Total Split (%)	55.3%	55.3%	55.3%	55.3%	55.3%	8.0%	36.7%	8.0%	36.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		34.1	34.1	34.1	34.1	61.6	57.1	58.6	51.4
Actuated g/C Ratio		0.32	0.32	0.32	0.32	0.57	0.53	0.54	0.48
v/c Ratio		0.86	0.18	0.59	0.15	0.64	0.59	0.14	0.55
Control Delay		55.9	5.5	41.6	10.8	26.9	20.9	13.5	22.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay		55.9	5.5	41.6	10.8	26.9	20.9	13.5	22.3
LOS		E	A	D	B	C	C	B	C
Approach Delay		44.5			29.5		21.4		22.1
Approach LOS		D			C		C		C

Intersection Summary			
Cycle Length: 150			
Actuated Cycle Length: 107.6			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 24.9		Intersection LOS: C	
Intersection Capacity Utilization 70.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Bayfield Street & East Side Marios Access/Georgian Mall South Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	269	51	93	124	28	53	140	1266	191	29	1095	141
Future Volume (vph)	269	51	93	124	28	53	140	1266	191	29	1095	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.90		1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1691	1468	1805	1695		1626	4861		1805	4911	
Flt Permitted		0.70	1.00	0.37	1.00		0.13	1.00		0.11	1.00	
Satd. Flow (perm)		1237	1468	707	1695		221	4861		210	4911	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	283	54	98	131	29	56	147	1333	201	31	1153	148
RTOR Reduction (vph)	0	0	67	0	39	0	0	10	0	0	8	0
Lane Group Flow (vph)	0	337	31	131	46	0	147	1524	0	31	1293	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	9%	0%	10%	0%	0%	0%	11%	5%	2%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		34.0	34.0	34.0	34.0		65.2	57.1		57.2	53.1	
Effective Green, g (s)		34.0	34.0	34.0	34.0		65.2	57.1		57.2	53.1	
Actuated g/C Ratio		0.31	0.31	0.31	0.31		0.60	0.52		0.52	0.49	
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		385	457	220	527		236	2541		169	2388	
v/s Ratio Prot					0.03		c0.05	0.31		0.01	0.26	
v/s Ratio Perm		c0.27	0.02	0.19			c0.32			0.09		
v/c Ratio		0.88	0.07	0.60	0.09		0.62	0.60		0.18	0.54	
Uniform Delay, d1		35.6	26.4	31.8	26.6		13.0	18.1		13.8	19.6	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		19.3	0.1	4.3	0.1		5.0	1.1		0.5	0.9	
Delay (s)		54.9	26.5	36.1	26.7		18.1	19.2		14.4	20.4	
Level of Service		D	C	D	C		B	B		B	C	
Approach Delay (s)		48.5			32.4			19.1			20.3	
Approach LOS		D			C			B			C	

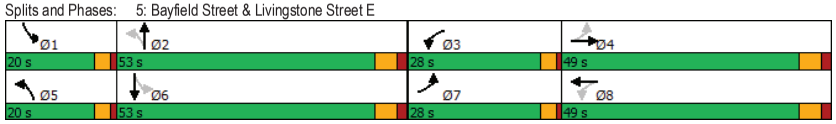
Intersection Summary					
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	109.2	Sum of lost time (s)		14.0	
Intersection Capacity Utilization	70.5%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	207	312	347	342	191	1395	159	1110
Future Volume (vph)	207	312	347	342	191	1395	159	1110
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	11.0	38.0	11.0	38.0	14.0	30.0	14.0	30.0
Total Split (s)	28.0	49.0	28.0	49.0	20.0	53.0	20.0	53.0
Total Split (%)	18.7%	32.7%	18.7%	32.7%	13.3%	35.3%	13.3%	35.3%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	38.6	20.5	47.5	25.7	65.5	49.3	61.3	47.3
Actuated g/C Ratio	0.31	0.17	0.39	0.21	0.53	0.40	0.50	0.38
v/c Ratio	0.59	0.76	0.88	0.62	0.70	0.93	0.70	0.70
Control Delay	33.7	53.8	52.6	46.6	36.7	45.1	41.0	35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	53.8	52.6	46.6	36.7	45.1	41.0	35.3
LOS	C	D	D	D	D	D	D	D
Approach Delay		47.4		49.2		44.3		35.9
Approach LOS		D		D		D		D

Intersection Summary			
Cycle Length: 150			
Actuated Cycle Length: 123.3			
Natural Cycle: 105			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 43.1		Intersection LOS: D	
Intersection Capacity Utilization 94.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 5: Bayfield Street & Livingstone Street E



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	312	126	347	342	94	191	1395	357	159	1110	131
Future Volume (vph)	207	312	126	347	342	94	191	1395	357	159	1110	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1783	3437		1930	3475		1787	4888		1805	4869	
Flt Permitted	0.39	1.00		0.21	1.00		0.10	1.00		0.08	1.00	
Satd. Flow (perm)	740	3437		396	3475		197	4888		160	4869	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	218	328	133	365	360	99	201	1468	376	167	1168	138
RTOR Reduction (vph)	0	34	0	0	18	0	0	26	0	0	9	0
Lane Group Flow (vph)	218	427	0	365	441	0	201	1818	0	167	1297	0
Confl. Peds. (#/hr)	11		4	4		11	14		1	1		14
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	3%	1%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.6	20.5		45.8	25.7		63.5	49.4		59.5	47.4	
Effective Green, g (s)	36.6	20.5		45.8	25.7		63.5	49.4		59.5	47.4	
Actuated g/C Ratio	0.30	0.17		0.37	0.21		0.52	0.40		0.48	0.38	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	355	571		412	724		283	1958		238	1871	
v/s Ratio Prot	0.08	0.12		c0.15	0.13		c0.08	c0.37		0.07	0.27	
v/s Ratio Perm	0.10			c0.18			0.28			0.27		
v/c Ratio	0.61	0.75		0.89	0.61		0.71	0.93		0.70	0.69	
Uniform Delay, d1	34.8	48.9		31.4	44.2		21.8	35.3		26.3	31.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	5.3		19.8	1.5		8.1	9.3		9.0	2.1	
Delay (s)	37.9	54.2		51.1	45.7		29.9	44.5		35.3	34.0	
Level of Service	D	D		D	D		C	D		D	C	
Approach Delay (s)		49.0			48.1			43.1			34.1	
Approach LOS		D			D			D			C	

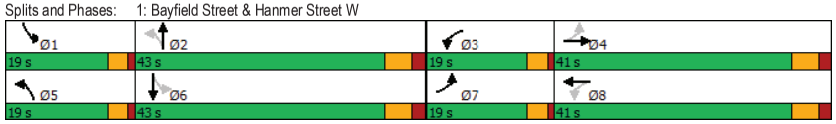
Intersection Summary					
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.92				
Actuated Cycle Length (s)	123.3	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	94.2%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	34	49	98	49	66	573	168	901
Future Volume (vph)	34	49	98	49	66	573	168	901
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	37.0	5.0	37.0
Minimum Split (s)	9.0	31.0	9.0	31.0	9.0	43.0	9.0	43.0
Total Split (s)	19.0	41.0	19.0	41.0	19.0	43.0	19.0	43.0
Total Split (%)	15.6%	33.6%	15.6%	33.6%	15.6%	35.2%	15.6%	35.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	19.0	10.1	24.8	16.6	46.2	37.1	51.4	41.4
Actuated g/C Ratio	0.22	0.12	0.29	0.19	0.54	0.43	0.60	0.48
v/c Ratio	0.12	0.42	0.30	0.28	0.21	0.34	0.37	0.43
Control Delay	23.5	14.1	25.5	11.9	9.0	17.0	9.8	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	14.1	25.5	11.9	9.0	17.0	9.8	16.0
LOS	C	B	C	B	A	B	A	B
Approach Delay		15.5		16.6		16.2		15.1
Approach LOS		B		B		B		B

Intersection Summary			
Cycle Length: 122			
Actuated Cycle Length: 85.9			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 72.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bayfield Street & Hanmer Street W



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	49	144	98	49	137	66	573	66	168	901	37
Future Volume (vph)	34	49	144	98	49	137	66	573	66	168	901	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.89		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3125		1802	3111		1719	4666		1787	4958	
Flt Permitted	0.62	1.00		0.46	1.00		0.25	1.00		0.32	1.00	
Satd. Flow (perm)	1152	3125		877	3111		451	4666		608	4958	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	53	157	107	53	149	72	623	72	183	979	40
RTOR Reduction (vph)	0	136	0	0	121	0	0	10	0	0	3	0
Lane Group Flow (vph)	37	74	0	107	81	0	72	685	0	183	1016	0
Confl. Peds. (#/hr)	1		5	5		1	1		3	3		1
Heavy Vehicles (%)	3%	2%	1%	0%	0%	3%	5%	10%	3%	1%	4%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.1	11.7		25.0	16.6		43.8	37.9		50.8	41.4	
Effective Green, g (s)	16.1	11.7		25.0	16.6		43.8	37.9		50.8	41.4	
Actuated g/C Ratio	0.18	0.13		0.28	0.19		0.50	0.43		0.58	0.47	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	239	414		345	584		308	2002		475	2324	
v/s Ratio Prot	0.01	0.02		c0.03	0.03		0.02	0.15		c0.04	c0.21	
v/s Ratio Perm	0.02			c0.06			0.10			0.18		
v/c Ratio	0.15	0.18		0.31	0.14		0.23	0.34		0.39	0.44	
Uniform Delay, d1	30.2	34.0		24.2	29.9		11.8	16.9		9.1	15.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.5	0.1		0.4	0.5		0.5	0.6	
Delay (s)	30.5	34.2		24.7	30.0		12.1	17.3		9.7	16.3	
Level of Service	C	C		C	C		B	B		A	B	
Approach Delay (s)		33.7			28.2			16.8			15.3	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	88.3	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	72.5%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	34	85	2	102	30	604	117	96	1023	24
Future Volume (Veh/h)	0	2	34	85	2	102	30	604	117	96	1023	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	2	39	97	2	116	34	686	133	109	1162	27
Pedestrians		9			1							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								139			212	
pX, platoon unblocked	0.91	0.91	0.89	0.91	0.91	0.95	0.89			0.95		
vC, conflicting volume	1816	2290	410	1467	2238	296	1198			820		
vC1, stage 1 conf vol	1402	1402		822	822							
vC2, stage 2 conf vol	414	888		645	1416							
vCu, unblocked vol	1188	1709	0	804	1651	81	770			631		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	96	73	99	87	95			88		
cM capacity (veh/h)	194	197	944	363	194	921	750			913		

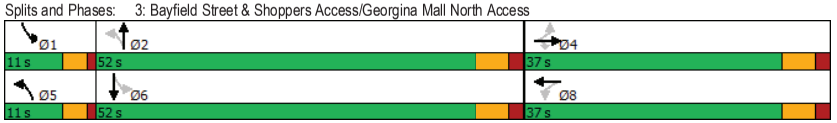
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	41	215	206	343	304	400	581	318
Volume Left	0	97	34	0	0	109	0	0
Volume Right	39	116	0	0	133	0	0	27
cSH	797	533	750	1700	1700	913	1700	1700
Volume to Capacity	0.05	0.40	0.05	0.20	0.18	0.12	0.34	0.19
Queue Length 95th (m)	1.3	15.5	1.1	0.0	0.0	3.2	0.0	0.0
Control Delay (s)	9.8	16.2	2.1	0.0	0.0	3.6	0.0	0.0
Lane LOS	A	C	A			A		
Approach Delay (s)	9.8	16.2	0.5			1.1		
Approach LOS	A	C						

Intersection Summary					
Average Delay			2.4		
Intersection Capacity Utilization			64.9%	ICU Level of Service	C
Analysis Period (min)			15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	25	6	49	11	3	64	723	31	1072
Future Volume (vph)	25	6	49	11	3	64	723	31	1072
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	11.0	30.0	11.0	30.0
Total Split (s)	37.0	37.0	37.0	37.0	37.0	11.0	52.0	11.0	52.0
Total Split (%)	37.0%	37.0%	37.0%	37.0%	37.0%	11.0%	52.0%	11.0%	52.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	4.0	6.0	4.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		10.0	10.0		10.0	57.8	53.1	57.1	51.0
Actuated g/C Ratio		0.13	0.13		0.13	0.75	0.69	0.75	0.67
v/c Ratio		0.19	0.21		0.07	0.20	0.27	0.06	0.39
Control Delay		33.8	7.4		25.7	4.0	6.8	3.0	8.5
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		33.8	7.4		25.7	4.0	6.8	3.0	8.5
LOS		C	A		C	A	A	A	A
Approach Delay		17.6			25.7		6.6		8.3
Approach LOS		B			C		A		A

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 76.6			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 53.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Bayfield Street & Shoppers Access/Georgina Mall North Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	6	49	11	3	5	64	723	20	31	1072	40
Future Volume (vph)	25	6	49	11	3	5	64	723	20	31	1072	40
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		4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1826	1615		2766		1735	4667		1805	4918	
Flt Permitted		0.75	1.00		0.80		0.18	1.00		0.32	1.00	
Satd. Flow (perm)		1429	1615		2272		328	4667		600	4918	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	29	7	57	13	3	6	74	841	23	36	1247	47
RTOR Reduction (vph)	0	0	51	0	5	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	36	6	0	17	0	74	862	0	36	1291	0
Confl. Peds. (#/hr)							7					7
Heavy Vehicles (%)	0%	0%	0%	25%	0%	25%	4%	11%	0%	0%	5%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		7.8	7.8		7.8		57.2	51.8		54.6	50.5	
Effective Green, g (s)		7.8	7.8		7.8		57.2	51.8		54.6	50.5	
Actuated g/C Ratio		0.10	0.10		0.10		0.72	0.65		0.69	0.63	
Clearance Time (s)		6.0	6.0		6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		139	158		222		330	3033		473	3116	
v/s Ratio Prot							c0.02	0.18		0.00	c0.26	
v/s Ratio Perm		c0.03	0.00		0.01		0.15			0.05		
v/c Ratio		0.26	0.04		0.07		0.22	0.28		0.08	0.41	
Uniform Delay, d1		33.3	32.5		32.7		3.6	6.0		4.0	7.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0	0.1		0.1		0.3	0.2		0.1	0.4	
Delay (s)		34.3	32.6		32.8		3.9	6.2		4.1	7.7	
Level of Service		C	C		C		A	A		A	A	
Approach Delay (s)		33.3			32.8			6.0			7.6	
Approach LOS		C			C			A			A	

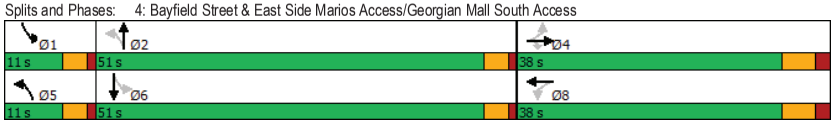
Intersection Summary				
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	53.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	80	11	26	10	3	25	728	13	1080
Future Volume (vph)	80	11	26	10	3	25	728	13	1080
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	35.0	35.0	35.0	35.0	35.0	11.0	30.0	11.0	30.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0	11.0	51.0	11.0	51.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	38.0%	11.0%	51.0%	11.0%	51.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		12.0	12.0	12.0	12.0	55.5	55.2	54.8	53.2
Actuated g/C Ratio		0.16	0.16	0.16	0.16	0.74	0.74	0.73	0.71
v/c Ratio		0.47	0.10	0.05	0.02	0.07	0.24	0.03	0.34
Control Delay		37.5	3.7	28.3	22.7	4.2	5.1	3.9	6.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		37.5	3.7	28.3	22.7	4.2	5.1	3.9	6.8
LOS		D	A	C	C	A	A	A	A
Approach Delay		30.0			26.3		5.0		6.8
Approach LOS		C			C		A		A

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 74.7			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 7.6		Intersection LOS: A	
Intersection Capacity Utilization 53.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Bayfield Street & East Side Marios Access/Georgian Mall South Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	11	26	10	3	3	25	728	56	13	1080	40
Future Volume (vph)	80	11	26	10	3	3	25	728	56	13	1080	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1683	1468	1805	1745		1626	4897		1805	4964	
Flt Permitted		0.75	1.00	0.69	1.00		0.19	1.00		0.32	1.00	
Satd. Flow (perm)		1314	1468	1317	1745		333	4897		608	4964	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	12	28	11	3	3	27	791	61	14	1174	43
RTOR Reduction (vph)	0	0	25	0	3	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	99	3	11	3	0	27	847	0	14	1215	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	9%	0%	10%	0%	0%	0%	11%	5%	2%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		9.7	9.7	9.7	9.7		56.8	54.3		54.2	53.0	
Effective Green, g (s)		9.7	9.7	9.7	9.7		56.8	54.3		54.2	53.0	
Actuated g/C Ratio		0.12	0.12	0.12	0.12		0.72	0.69		0.68	0.67	
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		160	179	161	213		279	3357		434	3321	
v/s Ratio Prot					0.00		c0.00	0.17		0.00	c0.24	
v/s Ratio Perm		c0.08	0.00	0.01			0.07			0.02		
v/c Ratio		0.62	0.02	0.07	0.02		0.10	0.25		0.03	0.37	
Uniform Delay, d1		33.0	30.6	30.8	30.6		3.5	4.7		4.0	5.7	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.9	0.0	0.2	0.0		0.2	0.2		0.0	0.3	
Delay (s)		39.9	30.6	30.9	30.6		3.6	4.9		4.0	6.1	
Level of Service		D	C	C	C		A	A		A	A	
Approach Delay (s)		37.9			30.8			4.9			6.0	
Approach LOS		D			C			A			A	

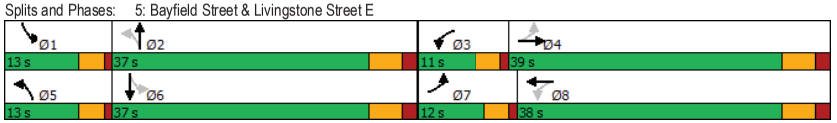
Intersection Summary				
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	79.2	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	53.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	115	175	160	176	93	721	92	1003
Future Volume (vph)	115	175	160	176	93	721	92	1003
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	11.0	38.0	11.0	38.0	11.0	30.0	11.0	30.0
Total Split (s)	12.0	39.0	11.0	38.0	13.0	37.0	13.0	37.0
Total Split (%)	12.0%	39.0%	11.0%	38.0%	13.0%	37.0%	13.0%	37.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	21.8	11.9	21.2	13.7	39.6	31.3	39.3	31.2
Actuated g/C Ratio	0.29	0.16	0.28	0.18	0.52	0.41	0.52	0.41
v/c Ratio	0.32	0.47	0.50	0.43	0.35	0.45	0.27	0.58
Control Delay	21.8	22.6	25.9	24.4	11.4	17.0	9.8	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	22.6	25.9	24.4	11.4	17.0	9.8	19.2
LOS	C	C	C	C	B	B	A	B
Approach Delay		22.4		25.0		16.5		18.5
Approach LOS		C		C		B		B

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 75.6			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 19.3		Intersection LOS: B	
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Bayfield Street & Livingstone Street E



HCM Signalized Intersection Capacity Analysis
5: Bayfield Street & Livingstone Street E

<Total 2030> Weekday AM Peak
03-16-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	175	87	160	176	76	93	721	113	92	1003	69
Future Volume (vph)	115	175	87	160	176	76	93	721	113	92	1003	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1799	3346		1768	3210		1640	4858		1735	4893	
Flt Permitted	0.58	1.00		0.54	1.00		0.17	1.00		0.26	1.00	
Satd. Flow (perm)	1105	3346		1003	3210		291	4858		476	4893	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	190	95	174	191	83	101	784	123	100	1090	75
RTOR Reduction (vph)	0	78	0	0	59	0	0	18	0	0	7	0
Lane Group Flow (vph)	125	207	0	174	215	0	101	889	0	100	1158	0
Confl. Peds. (#/hr)	11		4	4		11	14		1	1		14
Heavy Vehicles (%)	0%	3%	0%	2%	7%	6%	10%	4%	7%	4%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.0	12.8		20.8	13.7		37.5	31.3		37.3	31.2	
Effective Green, g (s)	19.0	12.8		20.8	13.7		37.5	31.3		37.3	31.2	
Actuated g/C Ratio	0.25	0.17		0.27	0.18		0.49	0.40		0.48	0.40	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	327	554		340	568		249	1967		329	1974	
v/s Ratio Prot	0.03	0.06		c0.05	0.07		c0.03	0.18		0.02	c0.24	
v/s Ratio Perm	0.06			c0.09			0.16			0.12		
v/c Ratio	0.38	0.37		0.51	0.38		0.41	0.45		0.30	0.59	
Uniform Delay, d1	23.6	28.7		22.9	28.0		11.5	16.8		11.1	18.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.4		1.3	0.4		1.1	0.8		0.5	1.3	
Delay (s)	24.4	29.1		24.2	28.5		12.6	17.5		11.7	19.3	
Level of Service	C	C		C	C		B	B		B	B	
Approach Delay (s)		27.7			26.8			17.0			18.7	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	63.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

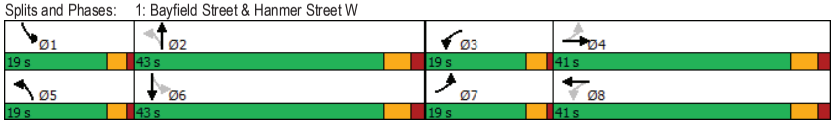
Timings
1: Bayfield Street & Hanmer Street W

<Total 2030> Weekday PM Peak
03-16-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	46	87	147	84	182	1154	160	909
Future Volume (vph)	46	87	147	84	182	1154	160	909
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	37.0	5.0	37.0
Minimum Split (s)	9.0	31.0	9.0	31.0	9.0	43.0	9.0	43.0
Total Split (s)	19.0	41.0	19.0	41.0	19.0	43.0	19.0	43.0
Total Split (%)	15.6%	33.6%	15.6%	33.6%	15.6%	35.2%	15.6%	35.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	19.6	10.4	27.7	18.7	50.1	37.7	49.2	37.2
Actuated g/C Ratio	0.22	0.12	0.31	0.21	0.56	0.42	0.55	0.42
v/c Ratio	0.17	0.50	0.43	0.37	0.50	0.69	0.59	0.49
Control Delay	24.2	18.2	27.6	12.0	13.4	23.7	22.2	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	18.2	27.6	12.0	13.4	23.7	22.2	20.7
LOS	C	B	C	B	B	C	C	C
Approach Delay		19.1		17.2		22.5		20.9
Approach LOS		B		B		C		C

Intersection Summary			
Cycle Length: 122			
Actuated Cycle Length: 89.4			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 21.0		Intersection LOS: C	
Intersection Capacity Utilization 76.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Bayfield Street & Hanmer Street W



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	87	160	147	84	210	182	1154	206	160	909	51
Future Volume (vph)	46	87	160	147	84	210	182	1154	206	160	909	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.89		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1804	3223		1767	3170		1805	4918		1787	4995	
Flt Permitted	0.56	1.00		0.42	1.00		0.21	1.00		0.11	1.00	
Satd. Flow (perm)	1068	3223		784	3170		395	4918		202	4995	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	93	170	156	89	223	194	1228	219	170	967	54
RTOR Reduction (vph)	0	147	0	0	177	0	0	18	0	0	4	0
Lane Group Flow (vph)	49	116	0	156	135	0	194	1429	0	170	1017	0
Confl. Peds. (#/hr)	1		5	5		1	1		3	3		1
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%	0%	3%	2%	1%	3%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.8	12.1		27.4	18.7		48.1	37.7		47.3	37.3	
Effective Green, g (s)	16.8	12.1		27.4	18.7		48.1	37.7		47.3	37.3	
Actuated g/C Ratio	0.18	0.13		0.30	0.21		0.53	0.41		0.52	0.41	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	234	428		357	650		369	2035		278	2045	
v/s Ratio Prot	0.01	0.04		c0.05	0.04		0.06	c0.29		c0.07	0.20	
v/s Ratio Perm	0.03			c0.08			0.22			0.25		
v/c Ratio	0.21	0.27		0.44	0.21		0.53	0.70		0.61	0.50	
Uniform Delay, d1	31.1	35.5		24.6	30.0		12.0	22.1		14.3	19.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.3		0.9	0.2		1.4	2.1		3.9	0.9	
Delay (s)	31.6	35.9		25.4	30.2		13.4	24.1		18.3	20.8	
Level of Service	C	D		C	C		B	C		B	C	
Approach Delay (s)		35.2			28.6			22.8			20.5	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	91.1	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	76.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	68	70	1	136	43	1407	140	59	1084	72
Future Volume (Veh/h)	0	0	68	70	1	136	43	1407	140	59	1084	72
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	72	74	1	143	45	1481	147	62	1141	76
Pedestrians		9			1							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								139			212	
pX, platoon unblocked	0.90	0.90	0.87	0.90	0.90	0.84	0.87			0.84		
vC, conflicting volume	2039	3031	427	2222	2996	568	1226			1629		
vC1, stage 1 conf vol	1312	1312		1646	1646							
vC2, stage 2 conf vol	727	1719		576	1350							
vCu, unblocked vol	816	1915	0	1019	1876	0	745			1077		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	92	58	99	84	94			89		
cM capacity (veh/h)	245	134	944	177	169	914	755			549		

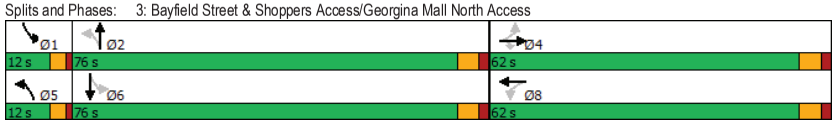
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	72	218	415	740	517	347	570	361
Volume Left	0	74	45	0	0	62	0	0
Volume Right	72	143	0	0	147	0	0	76
cSH	944	376	755	1700	1700	549	1700	1700
Volume to Capacity	0.08	0.58	0.06	0.44	0.30	0.11	0.34	0.21
Queue Length 95th (m)	2.0	28.1	1.5	0.0	0.0	3.0	0.0	0.0
Control Delay (s)	9.1	27.0	1.8	0.0	0.0	3.6	0.0	0.0
Lane LOS	A	D	A			A		
Approach Delay (s)	9.1	27.0	0.4			1.0		
Approach LOS	A	D						

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	83.9%	ICU Level of Service	E	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	80	10	103	109	13	133	1430	85	1100
Future Volume (vph)	80	10	103	109	13	133	1430	85	1100
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	11.0	30.0	11.0	30.0
Total Split (s)	62.0	62.0	62.0	62.0	62.0	12.0	76.0	12.0	76.0
Total Split (%)	41.3%	41.3%	41.3%	41.3%	41.3%	8.0%	50.7%	8.0%	50.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	4.0	6.0	4.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		14.5	14.5		14.5	79.9	70.4	79.3	70.1
Actuated g/C Ratio		0.13	0.13		0.13	0.74	0.65	0.73	0.65
v/c Ratio		0.65	0.35		0.52	0.37	0.51	0.34	0.37
Control Delay		64.8	11.0		29.8	6.4	10.8	7.1	9.6
Queue Delay		0.0	0.0		0.0	0.0	0.4	0.0	0.0
Total Delay		64.8	11.0		29.8	6.4	11.2	7.1	9.6
LOS		E	B		C	A	B	A	A
Approach Delay		36.1			29.8		10.8		9.4
Approach LOS		D			C		B		A

Intersection Summary			
Cycle Length: 150			
Actuated Cycle Length: 108.1			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 12.9		Intersection LOS: B	
Intersection Capacity Utilization 62.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Bayfield Street & Shoppers Access/Georgina Mall North Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	10	103	109	13	84	133	1430	116	85	1100	43
Future Volume (vph)	80	10	103	109	13	84	133	1430	116	85	1100	43
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		4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.94		1.00	0.99		1.00	0.99	
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1819	1615		3238		1805	4983		1805	5009	
Flt Permitted		0.58	1.00		0.77		0.20	1.00		0.11	1.00	
Satd. Flow (perm)		1108	1615		2571		376	4983		217	5009	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	11	110	116	14	89	141	1521	123	90	1170	46
RTOR Reduction (vph)	0	0	95	0	77	0	0	4	0	0	2	0
Lane Group Flow (vph)	0	96	15	0	142	0	141	1640	0	90	1214	0
Confl. Peds. (#/hr)							7					7
Heavy Vehicles (%)	0%	0%	0%	3%	0%	1%	0%	3%	2%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		14.5	14.5		14.5		77.9	70.4		77.3	70.1	
Effective Green, g (s)		14.5	14.5		14.5		77.9	70.4		77.3	70.1	
Actuated g/C Ratio		0.13	0.13		0.13		0.72	0.65		0.72	0.65	
Clearance Time (s)		6.0	6.0		6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		148	216		344		370	3245		260	3248	
v/s Ratio Prot							c0.03	c0.33		0.02	0.24	
v/s Ratio Perm		c0.09	0.01		0.06		0.25			0.22		
v/c Ratio		0.65	0.07		0.41		0.38	0.51		0.35	0.37	
Uniform Delay, d1		44.4	40.9		42.9		4.9	9.8		5.7	8.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.4	0.1		0.8		0.7	0.6		0.8	0.3	
Delay (s)		53.8	41.0		43.7		5.6	10.4		6.5	9.1	
Level of Service		D	D		D		A	B		A	A	
Approach Delay (s)		47.0			43.7			10.0			9.0	
Approach LOS		D			D			A			A	

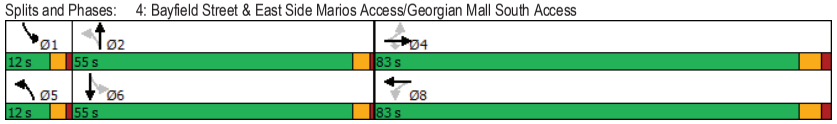
Intersection Summary					
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.52				
Actuated Cycle Length (s)	108.1	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	62.1%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	269	51	93	124	28	140	1344	29	1143
Future Volume (vph)	269	51	93	124	28	140	1344	29	1143
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4			8	5	2	1	6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	35.0	35.0	35.0	35.0	35.0	11.0	30.0	11.0	30.0
Total Split (s)	83.0	83.0	83.0	83.0	83.0	12.0	55.0	12.0	55.0
Total Split (%)	55.3%	55.3%	55.3%	55.3%	55.3%	8.0%	36.7%	8.0%	36.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max
Act Effct Green (s)		34.1	34.1	34.1	34.1	61.6	57.1	58.6	51.4
Actuated g/C Ratio		0.32	0.32	0.32	0.32	0.57	0.53	0.54	0.48
v/c Ratio		0.86	0.18	0.59	0.15	0.66	0.62	0.15	0.57
Control Delay		55.9	5.5	41.6	10.8	29.0	21.6	13.7	22.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay		55.9	5.5	41.6	10.8	29.0	21.6	13.7	22.7
LOS		E	A	D	B	C	C	B	C
Approach Delay		44.5			29.5		22.2		22.5
Approach LOS		D			C		C		C

Intersection Summary			
Cycle Length: 150			
Actuated Cycle Length: 107.6			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 25.3		Intersection LOS: C	
Intersection Capacity Utilization 72.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Bayfield Street & East Side Marios Access/Georgian Mall South Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	269	51	93	124	28	53	140	1344	191	29	1143	141
Future Volume (vph)	269	51	93	124	28	53	140	1344	191	29	1143	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.90		1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1691	1468	1805	1695		1626	4865		1805	4914	
Flt Permitted		0.70	1.00	0.37	1.00		0.12	1.00		0.10	1.00	
Satd. Flow (perm)		1237	1468	707	1695		204	4865		182	4914	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	283	54	98	131	29	56	147	1415	201	31	1203	148
RTOR Reduction (vph)	0	0	67	0	39	0	0	9	0	0	8	0
Lane Group Flow (vph)	0	337	31	131	46	0	147	1607	0	31	1343	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	9%	0%	10%	0%	0%	0%	11%	5%	2%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		34.0	34.0	34.0	34.0		65.2	57.1		57.2	53.1	
Effective Green, g (s)		34.0	34.0	34.0	34.0		65.2	57.1		57.2	53.1	
Actuated g/C Ratio		0.31	0.31	0.31	0.31		0.60	0.52		0.52	0.49	
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		385	457	220	527		227	2543		156	2389	
v/s Ratio Prot					0.03		c0.05	0.33		0.01	0.27	
v/s Ratio Perm		c0.27	0.02	0.19			c0.34			0.10		
v/c Ratio		0.88	0.07	0.60	0.09		0.65	0.63		0.20	0.56	
Uniform Delay, d1		35.6	26.4	31.8	26.6		13.5	18.6		14.2	19.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		19.3	0.1	4.3	0.1		6.2	1.2		0.6	1.0	
Delay (s)		54.9	26.5	36.1	26.7		19.8	19.8		14.8	20.8	
Level of Service		D	C	D	C		B	B		B	C	
Approach Delay (s)		48.5			32.4			19.8			20.7	
Approach LOS		D			C			B			C	

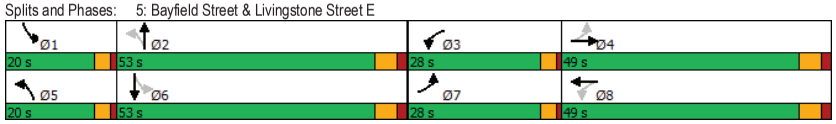
Intersection Summary					
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.75				
Actuated Cycle Length (s)	109.2	Sum of lost time (s)		14.0	
Intersection Capacity Utilization	72.0%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	218	312	347	342	191	1451	177	1122
Future Volume (vph)	218	312	347	342	191	1451	177	1122
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	24.0	7.0	24.0
Minimum Split (s)	11.0	38.0	11.0	38.0	14.0	30.0	14.0	30.0
Total Split (s)	28.0	49.0	28.0	49.0	20.0	53.0	20.0	53.0
Total Split (%)	18.7%	32.7%	18.7%	32.7%	13.3%	35.3%	13.3%	35.3%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	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	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	39.2	20.5	47.4	25.1	64.4	48.3	62.4	47.3
Actuated g/C Ratio	0.32	0.17	0.38	0.20	0.52	0.39	0.51	0.38
v/c Ratio	0.63	0.76	0.88	0.65	0.72	0.98	0.73	0.71
Control Delay	34.9	53.8	52.7	47.5	39.5	53.7	43.4	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	53.8	52.7	47.5	39.5	53.7	43.4	35.7
LOS	C	D	D	D	D	D	D	D
Approach Delay		47.5		49.8		52.3		36.7
Approach LOS		D		D		D		D

Intersection Summary			
Cycle Length: 150			
Actuated Cycle Length: 123.3			
Natural Cycle: 105			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 46.6		Intersection LOS: D	
Intersection Capacity Utilization 96.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 5: Bayfield Street & Livingstone Street E



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	218	312	126	347	342	105	191	1451	357	177	1122	149
Future Volume (vph)	218	312	126	347	342	105	191	1451	357	177	1122	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1784	3437		1930	3462		1787	4892		1805	4861	
Flt Permitted	0.36	1.00		0.21	1.00		0.10	1.00		0.08	1.00	
Satd. Flow (perm)	681	3437		396	3462		187	4892		161	4861	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	229	328	133	365	360	111	201	1527	376	186	1181	157
RTOR Reduction (vph)	0	34	0	0	21	0	0	25	0	0	10	0
Lane Group Flow (vph)	229	427	0	365	450	0	201	1878	0	186	1328	0
Confl. Peds. (#/hr)	11		4	4		11	14		1	1		14
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	3%	1%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.2	20.5		45.8	25.1		62.4	48.3		60.4	47.3	
Effective Green, g (s)	37.2	20.5		45.8	25.1		62.4	48.3		60.4	47.3	
Actuated g/C Ratio	0.30	0.17		0.37	0.20		0.51	0.39		0.49	0.38	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	355	571		412	705		277	1917		253	1866	
v/s Ratio Prot	0.09	0.12		c0.15	0.13		c0.08	c0.38		0.08	0.27	
v/s Ratio Perm	0.11			c0.18			0.28			0.28		
v/c Ratio	0.65	0.75		0.89	0.64		0.73	0.98		0.74	0.71	
Uniform Delay, d1	34.6	48.9		31.3	44.9		23.8	37.0		29.4	32.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	5.3		19.8	1.9		9.1	16.3		10.6	2.3	
Delay (s)	38.6	54.2		51.1	46.8		32.9	53.2		40.0	34.5	
Level of Service	D	D		D	D		C	D		D	C	
Approach Delay (s)		49.0			48.7			51.3			35.2	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM 2000 Control Delay	45.8	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.94				
Actuated Cycle Length (s)	123.2	Sum of lost time (s)	20.0		
Intersection Capacity Utilization	96.2%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group

Intersection: 1: Bayfield Street & Hanmer Street W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	TR	L	T
Maximum Queue (m)	21.0	20.3	39.0	40.4	20.9	25.9	22.2	37.8	41.0	44.7	57.0	87.7
Average Queue (m)	7.3	7.3	15.6	16.4	8.4	11.4	11.0	17.8	21.8	24.5	20.5	36.8
95th Queue (m)	16.9	16.7	31.3	31.9	17.6	20.4	20.9	32.5	36.9	40.6	38.4	60.9
Link Distance (m)		501.2	501.2		513.6	513.6		188.1	188.1	188.1		340.7
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	29.0			43.0			22.0				19.0	
Storage Blk Time (%)				0			0	4			9	24
Queuing Penalty (veh)				0			1	3			27	40

Intersection: 1: Bayfield Street & Hanmer Street W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	57.9	61.1
Average Queue (m)	29.8	19.0
95th Queue (m)	49.3	42.2
Link Distance (m)	340.7	340.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Bayfield Street & LCBO Access/Site Access

Movement	EB	WB	NB	NB	SB	SB
Directions Served	TR	LTR	LT	TR	LT	T
Maximum Queue (m)	20.2	76.5	35.5	6.7	33.1	28.0
Average Queue (m)	6.7	32.1	9.0	0.6	14.3	0.9
95th Queue (m)	16.3	68.1	26.9	3.8	28.7	9.2
Link Distance (m)	31.3	71.9	117.5	117.5	188.1	188.1
Upstream Blk Time (%)		5				
Queuing Penalty (veh)		0				
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Bayfield Street & Shoppers Access/Georgina Mall North Access

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	T	T	TR	L	T	T	TR
Maximum Queue (m)	23.9	22.7	8.9	8.6	25.8	25.9	14.7	40.2	15.0	62.9	68.3	54.5
Average Queue (m)	6.0	7.1	2.5	1.7	8.4	8.4	4.4	7.2	4.2	20.7	24.8	23.5
95th Queue (m)	16.7	15.4	8.7	7.3	19.7	21.4	11.9	23.1	11.8	46.1	52.6	45.3
Link Distance (m)	29.5	29.5	24.8	24.8		147.2	147.2	147.2		117.5	117.5	117.5
Upstream Blk Time (%)	0											
Queuing Penalty (veh)	0											
Storage Bay Dist (m)					15.0				15.0			
Storage Blk Time (%)					2	4			0	6		
Queuing Penalty (veh)					6	3			1	2		

Intersection: 4: Bayfield Street & East Side Marios Access/Georgian Mall South Access

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	TR	L	T	T	TR
Maximum Queue (m)	34.3	23.6	14.3	8.8	18.3	52.5	30.8	42.8	15.0	45.4	42.8	51.0
Average Queue (m)	15.7	5.7	2.9	1.4	4.9	8.3	7.9	9.8	2.1	16.1	15.3	18.0
95th Queue (m)	28.7	16.4	9.8	6.5	13.6	27.7	23.6	26.9	8.7	34.9	36.7	39.9
Link Distance (m)	35.6	35.6	40.1	40.1		363.3	363.3	363.3		147.2	147.2	147.2
Upstream Blk Time (%)	0											
Queuing Penalty (veh)	0											
Storage Bay Dist (m)					18.0				23.0			
Storage Blk Time (%)					0	1				2		
Queuing Penalty (veh)					1	0				0		

Intersection: 5: Bayfield Street & Livingstone Street E

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	TR	L	T
Maximum Queue (m)	41.3	32.8	40.1	53.4	33.9	41.1	33.9	71.3	67.1	64.9	34.2	75.1
Average Queue (m)	17.0	18.4	17.2	23.8	16.6	15.8	15.8	37.9	29.8	25.4	14.2	38.5
95th Queue (m)	30.5	31.8	30.3	41.2	30.0	28.6	28.4	59.1	51.1	49.2	26.9	62.1
Link Distance (m)		261.1	261.1		373.3	373.3	455.1	455.1	455.1	455.1		363.3
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	30.0			25.0							23.0	
Storage Blk Time (%)	3	1		8	4						2	21
Queuing Penalty (veh)	3	2		7	7						6	19

Intersection: 5: Bayfield Street & Livingstone Street E

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	79.2	73.1
Average Queue (m)	46.8	48.6
95th Queue (m)	73.3	74.3
Link Distance (m)	363.3	363.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 127

Intersection: 1: Bayfield Street & Hanmer Street W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	TR	L	T
Maximum Queue (m)	20.2	26.7	44.2	46.6	27.4	52.8	48.9	97.1	103.8	128.0	60.8	83.4
Average Queue (m)	9.5	11.2	19.4	26.3	10.5	23.5	27.9	42.3	56.6	69.8	21.9	46.3
95th Queue (m)	17.4	20.8	36.1	42.8	23.6	41.4	48.7	68.3	85.0	101.5	45.9	74.6
Link Distance (m)		501.2	501.2		513.6	513.6		188.1	188.1	188.1		340.7
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	29.0			43.0			22.0				19.0	
Storage Blk Time (%)		0		1			15	26			11	31
Queuing Penalty (veh)		0		1			58	47			32	50

Intersection: 1: Bayfield Street & Hanmer Street W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	72.6	71.2
Average Queue (m)	36.9	30.4
95th Queue (m)	63.4	53.6
Link Distance (m)	340.7	340.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Bayfield Street & LCBO Access/Site Access

Movement	EB	WB	NB	NB	NB	SB	SB
Directions Served	TR	LTR	LT	T	TR	LT	T
Maximum Queue (m)	15.4	76.5	46.6	22.6	16.9	65.7	49.8
Average Queue (m)	8.1	76.1	11.9	0.8	1.2	22.5	5.1
95th Queue (m)	14.0	78.4	31.6	7.5	7.1	52.8	27.1
Link Distance (m)	31.3	71.9	117.5	117.5	117.5	188.1	188.1
Upstream Blk Time (%)		100					
Queuing Penalty (veh)		0					
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: Bayfield Street & Shoppers Access/Georgina Mall North Access

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	T	T	TR	L	T	T	TR
Maximum Queue (m)	34.1	29.4	35.5	29.4	22.1	80.5	92.8	109.8	46.9	64.1	59.9	59.9
Average Queue (m)	17.2	12.4	22.4	11.7	11.9	38.2	46.1	54.7	14.6	26.0	27.4	31.8
95th Queue (m)	32.4	23.5	34.3	21.8	22.2	69.2	83.2	94.3	31.2	49.1	49.4	54.4
Link Distance (m)	29.5	29.5	24.8	24.8		147.2	147.2	147.2		117.5	117.5	117.5
Upstream Blk Time (%)	4	0	12	0								
Queuing Penalty (veh)	0	0	0	0								
Storage Bay Dist (m)					15.0				15.0			
Storage Blk Time (%)					6	15			10	13		
Queuing Penalty (veh)					28	20			37	11		

Intersection: 4: Bayfield Street & East Side Marios Access/Georgian Mall South Access

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	TR	L	T	T	TR	L	T	T	TR
Maximum Queue (m)	51.5	27.9	44.7	44.1	50.9	140.5	119.9	153.9	49.6	94.2	105.8	96.9
Average Queue (m)	39.7	11.2	18.6	11.0	25.0	54.1	61.2	73.3	7.0	45.4	52.3	58.4
95th Queue (m)	48.0	21.2	34.5	26.1	50.9	106.3	111.9	134.6	21.8	77.2	88.9	92.3
Link Distance (m)	35.6	35.6	40.1	40.1		363.3	363.3	363.3		147.2	147.2	147.2
Upstream Blk Time (%)	31		1	0								
Queuing Penalty (veh)	0		0	0								
Storage Bay Dist (m)					18.0				23.0			
Storage Blk Time (%)					12	20				18		
Queuing Penalty (veh)					52	29				5		

Intersection: 5: Bayfield Street & Livingstone Street E

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	TR	L	T
Maximum Queue (m)	71.8	58.2	66.4	103.5	106.8	85.6	459.7	465.6	459.7	459.7	69.5	130.9
Average Queue (m)	41.0	37.9	40.6	71.5	48.9	51.3	217.6	354.9	342.8	343.2	41.5	63.6
95th Queue (m)	66.8	54.5	62.0	107.2	81.3	72.8	453.1	490.1	476.2	477.3	63.6	101.2
Link Distance (m)		261.1	261.1		373.3	373.3	455.1	455.1	455.1	455.1		363.3
Upstream Blk Time (%)							3	10	6	9		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (m)	30.0			25.0							23.0	
Storage Blk Time (%)	23	23		55	30						46	41
Queuing Penalty (veh)	36	50		95	105						171	73

Intersection: 5: Bayfield Street & Livingstone Street E

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	132.7	126.8
Average Queue (m)	74.2	80.4
95th Queue (m)	110.6	115.3
Link Distance (m)	363.3	363.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 900

APPENDIX C

Level of Service Definitions

LEVEL OF SERVICE ANALYSIS AT SIGNALIZED INTERSECTIONS

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". The term Level of Service implies a qualitative measure of traffic flow at an intersection. It is dependent upon vehicle delay and vehicle queue lengths at the approaches. Specifically, Level of Service criteria are stated in terms of the average stopped delay per vehicle for a 15-minute analysis period. The following table describes the characteristics of each level:

Level of Service	Features	Stopped Delay per Vehicle (sec)
A	At this level of service, almost no signal phase is fully utilized by traffic. Very seldom does a vehicle wait longer than one red indication. The approach appears open, turning movements are easily made and drivers have freedom of operation.	≤ 5.0
B	At this level, an occasional signal phase is fully utilized and many phases approach full use. Many drivers begin to feel somewhat restricted within platoons of vehicles approaching the intersection.	> 5.0 and ≤ 15.0
C	At this level, the operation is stable though with more frequent fully utilized signal phases. Drivers feel more restricted and occasionally may have to wait more than one red signal indication, and queues may develop behind turning vehicles. This level is normally employed in urban intersection design.	> 15.0 and ≤ 25.0
D	At this level, the motorist experiences increasing restriction and instability of flow. There are substantial delays to approaching vehicles during short peaks within the peak period, but there are enough cycles with lower demand to permit occasional clearance of developing queues and prevent excessive backups.	> 25.0 and ≤ 40.0
E	At this level, capacity is reached. There are long queues of vehicles waiting upstream of the intersection and delays to vehicles may extend to several signal cycles.	> 40.0 and ≤ 60.0
F	At this level, saturation occurs, with vehicle demand exceeding the available capacity.	> 60.0

LEVEL OF SERVICE ANALYSIS AT UNSIGNALIZED INTERSECTIONS[1]

The term "level of service" implies a qualitative measure of traffic flow at an intersection. It is dependent upon the vehicle delay and vehicle queue lengths at approaches. The level of service at unsignalized intersections is often related to the delay accumulated by flows on the minor streets, caused by all other conflicting movements. The following table describes the characteristics of each level.

Level of Service	Features
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.
E	Very long traffic delays occur. Operations approach the capacity of the intersection.
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.

---

(1) Highway Capacity Manual - Special Report No. 209, Transportation Research Board, 1985.

APPENDIX D

City of Barrie, Zoning By-law Excerpts

Table 4.6	
Uses	**Parking Standards**
Residential building containing not more than 3 dwelling units	1.5 space per *dwelling unit*. Tandem parking will be permitted. (By-law 2019-115)
Residential building containing more than 3 dwelling units	1.5 spaces per *dwelling unit*
Residential dwelling(s) in the Urban Growth Centre (see Appendix "C").	1 space per dwelling unit(s) (By-law 2014-110)
Restaurant	1 space per 4 persons
Retail Store	1 space per 30m^2 of *gross floor area* min. 2 spaces
Secondary School	1 space per classroom and per office plus 1 space per 10 students
Self Storage	1 space per 500m^2 of *gross floor area*
Service Store	1 space per 50m^2 of *gross floor area*
Shopping Centre	1 space per 18.6m^2 of *gross leasable floor area*
Social Services Facility	1 space per 30m^2 of *gross floor* area min. 2 spaces. No parking is required in the Urban Growth Centre. (By-law 2016-057)
Theatre	1 space for every 4 persons
Training and Rehabilitation Centre	1 space per 50m^2 of *gross floor area*
Truck Terminal	1 space per 1,000m^2 of *gross floor area*
University	1 space per classroom and per office plus 1 space per 10 students
Veterinary Clinic	1 space per 50m^2 of *gross floor area* min. 2 spaces
Warehousing excluding Self Storage	1 space per 1,000m^2 of *gross floor area*
Wholesale Establishment	1 space per 50m^2 of *gross floor area*

4.6.2 Parking

4.6.2.1 *Parking spaces* shall be provided and maintained in accordance with the following requirements and shall be provided on the same *lot* as the *building* or *use* for which they are required.

4.6.2.2 Parking Based on Occupancy

Where parking provisions in Table 4.6 relate to spaces per person or student, this shall be calculated based on the maximum number of persons which can be accommodated within the *use* according to the Ontario Building Code, as amended, unless otherwise specified.

4.6.2.3 Parking - Multiple Uses

That notwithstanding the parking requirements set out in Table 4.6, where there are 2 or more permitted uses in any *building* or on any *lot*, the following parking requirements shall apply:

a) Multiple Uses in Industrial Zones: A minimum of 1 parking space per 40m^2 of gross floor area shall be required except where the data processing centre is in combination with another use, in which case the data processing centre components shall be at the rate identified in Table 4.6

APPENDIX E

City' s Correspondence

RE: 535 Bayfield St

Andrew Gameiro <Andrew.Gameiro@barrie.ca>

Wed 6/22/2022 11:19 AM

To: Jing Min <Jing.Min@trans-plan.com>;Donson Chan <Donson.Chan@barrie.ca>

Cc: cpittelli@evansplanning.com <cpittelli@evansplanning.com>

Hi All,

At the pre-con meeting, staff noted that we would consider a parking ratio of 1 space/30 sq.m. of commercial space.

As identified in Table 4.6 of Zoning By-law 2009-141, the 1/30 sq.m. parking ratio applies to a wide variety of commercial uses, including retail and office spaces. This provision has been applied to other mixed-use sites in the City such as 430 Essa Road (File: D11-023-2017).

This parking ratio would provide a bit of flexibility on-site.

Kind regards,

Andrew Gameiro, BES, RPP
Senior Planner
Development Services Department

City of Barrie: City Hall, 70 Collier Street, P.O. Box 400, Barrie ON, L4M 4T5
Ext. 5038
www.barrie.ca

From: Jing Min <Jing.Min@trans-plan.com>
Sent: Tuesday, June 21, 2022 4:29 PM
To: Donson Chan <Donson.Chan@barrie.ca>
Cc: Andrew Gameiro <Andrew.Gameiro@barrie.ca>; cpittelli@evansplanning.com
Subject: Re: 535 Bayfield St

Hi Donson,

Thanks again for the information. I have another question regarding the required parking rate for commercial uses.

As show on the site plan, a rate of 1 space per 24 sqm is used for commercial uses. Our team is under the impression that the rate (commercial uses) was previously agreed upon with the City during our previous pre-consultation. Would you be able to confirm if the rate is appropriate for our parking study?

Thank you,

RE: 535 Bayfield St

Donson Chan <Donson.Chan@barrie.ca>
Wed 8/3/2022 12:29 PM
To: Jing Min <Jing.Min@trans-plan.com>
Cc: Andrew Gameiro <Andrew.Gameiro@barrie.ca>

Hi Jing Min,

Please note that due to the nature of the site, the following timing is suggested:

1. Weekday 10am to 8pm
2. Saturday 10am to 6pm

Kind regards,

Donson Chan, P.Eng.
Transportation Engineer – Infrastructure and Growth Management, Development Services
The City of Barrie
Mobile 249-733-5355
Please consider the environment before printing this email.

From: Jing Min <Jing.Min@trans-plan.com>
Sent: Tuesday, August 2, 2022 11:11 AM
To: Donson Chan <Donson.Chan@barrie.ca>
Cc: Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Subject: Re: 535 Bayfield St

Hi Donson,

Thanks for the comments.

We plan to survey the commercial 531 Bayfield Street first for one weekday and one Saturday. We are going to record the parking demand and any overflow from 12pm to 8pm for the weekday and from 12pm to 5pm on the Saturday. Would you be able to confirm the timing is acceptable to the City?

Thank you,

Jing Min
Traffic Analyst | TRANS-PLAN
Transportation Engineering

Toll Free: +1 (877) 668-8784 (TPTI)
Office/Fax: +1 (647) 931-7383 Ext:128
Cell: +1 (226) 978-3203
Email: jing.min@trans-plan.com
W: www.trans-plan.com

Company portfolio: Trans-Plan Project Experience
Asset Management: AssetCity
Head office: 785 Dundas Street West, Toronto, Ontario M6J 1V2

From: Donson Chan <Donson.Chan@barrie.ca>
Sent: Monday, July 25, 2022 3:27 PM
To: Jing Min <Jing.Min@trans-plan.com>; Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Cc: Frank Venditti <fvenditti@evansplanning.com>
Subject: RE: 535 Bayfield St

Thank you Jing, please proceed with the proposed work scope. Additionally, we understand that there are limited proxy sites located within City boundaries. Thus, if necessary, the proxy site do not have to be located within the City of Barrie, however the proxy sites must be selected from comparable cities to the City of Barrie.

Kind regards,

Donson Chan, P.Eng.
Transportation Engineer – Infrastructure and Growth Management, Development Services
The City of Barrie
Mobile 249-733-5355
Please consider the environment before printing this email.

From: Jing Min <Jing.Min@trans-plan.com>
Sent: Thursday, July 21, 2022 4:53 PM
To: Donson Chan <Donson.Chan@barrie.ca>; Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Cc: Frank Venditti <fvenditti@evansplanning.com>
Subject: Re: 535 Bayfield St

Sorry, forgot the attachment. Here's the site plan. Thanks,

Jing Min
Traffic Analyst | TRANS-PLAN
Transportation Engineering

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Office/Fax: +1 (647) 931-7383 Ext:128
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W: www.trans-plan.com

Company portfolio: Trans-Plan Project Experience
Asset Management: AssetCity
Head office: 785 Dundas Street West, Toronto, Ontario M6J 1V2

From: Jing Min <Jing.Min@trans-plan.com>
Sent: Thursday, July 21, 2022 4:51 PM
To: Donson Chan <Donson.Chan@barrie.ca>; Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Cc: Frank Venditti <fvenditti@evansplanning.com>
Subject: Re: 535 Bayfield St

Hi Donson,

Hope all is well!

The site plan has been updated since we last talked. A copy is attached for your reference. We wanted to provided our mythology to capture/estimate the peak parking demand before moving forward:

Commerical Parking (for Building 1): We plan to conduct a proxy parking survey at the commercial building at 531 Bayfield Street, Barrie, just south of our site. We will capture the peak demand during weekday and weekend (Saturday).

Residential Parking (Building 3& 4): Andrew has previously provided a list of recently approved developments as residential/ mixed-use proxy sites. We plan to conduct a review of recently approved developments provided by Andrew, other existing similar developments in the area and our previous parking survey results (peak demands) for similar developments nearby.

Let us know if you have any comments/concern with our work scope. Any feedback would be greatly appreciated.

Thank you,

Jing Min
Traffic Analyst | TRANS-PLAN
Transportation Engineering

Toll Free: +1 (877) 668-8784 (TPTI)
Office/Fax: +1 (647) 931-7383 Ext:128
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W: www.trans-plan.com

Company portfolio: Trans-Plan Project Experience
Asset Management: AssetCity
Head office: 785 Dundas Street West, Toronto, Ontario M6J 1V2

From: Donson Chan <Donson.Chan@barrie.ca>
Sent: Tuesday, June 21, 2022 2:00 PM
To: Jing Min <Jing.Min@trans-plan.com>; Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Subject: RE: 535 Bayfield St

Hi Jing,

For the parking study, we recommend the applicant review additional proxy sites that reflect the scale and nature of the proposed development; review of weekday (daytime and evening) and weekend peak demand; transportation demand management (such as unbundling parking stalls, access to transit, pre-purchased transit passes, car share, active transportation).

Hope this answers your question.

Please feel free to contact me if you have any questions or concerns.

Kind regards,

Fwd: 535 Bayfield St

Jing Min <Jing.Min@trans-plan.com>
Wed 12/14/2022 2:15 AM
To: Ahmed Kassim <ahmed.kassim@trans-plan.com>

Get Outlook for iOS

From: Donson Chan <Donson.Chan@barrie.ca>
Sent: Monday, July 25, 2022 12:27:06 PM
To: Jing Min <Jing.Min@trans-plan.com>; Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Cc: Frank Venditti <fvenditti@evansplanning.com>
Subject: RE: 535 Bayfield St

Thank you Jing, please proceed with the proposed work scope. Additionally, we understand that there are limited proxy sites located within City boundaries. Thus, if necessary, the proxy site do not have to be located within the City of Barrie, however the proxy sites must be selected from comparable cities to the City of Barrie.

Kind regards,

Donson Chan, P.Eng.
Transportation Engineer – Infrastructure and Growth Management, Development Services
The City of Barrie
Mobile 249-733-5355

From: Jing Min <Jing.Min@trans-plan.com>
Sent: Thursday, July 21, 2022 4:53 PM
To: Donson Chan <Donson.Chan@barrie.ca>; Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Cc: Frank Venditti <fvenditti@evansplanning.com>
Subject: Re: 535 Bayfield St

Sorry, forgot the attachment. Here's the site plan. Thanks,

Jing Min
Traffic Analyst | TRANS-PLAN
Transportation Engineering

Toll Free: +1 (877) 668-8784 (TPTI)
Office/Fax: +1 (647) 931-7383 Ext:128
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W: www.trans-plan.com

Company portfolio: Trans-Plan Project Experience
Asset Management: AssetCity
Head office: 785 Dundas Street West, Toronto, Ontario M6J 1V2

From: Jing Min <Jing.Min@trans-plan.com>
Sent: Thursday, July 21, 2022 4:51 PM
To: Donson Chan <Donson.Chan@barrie.ca>; Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Cc: Frank Venditti <fvenditti@evansplanning.com>
Subject: Re: 535 Bayfield St

Hi Donson,

Hope all is well!

The site plan has been updated since we last talked. A copy is attached for your reference. We wanted to provided our mythology to capture/estimate the peak parking demand before moving forward:

Commerical Parking (for Building 1): We plan to conduct a proxy parking survey at the commercial building at 531 Bayfield Street, Barrie, just south of our site. We will capture the peak demand during weekday and weekend (Saturday).

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Let us know if you have any comments/concern with our work scope. Any feedback would be greatly appreciated.

Thank you,

Jing Min
Traffic Analyst | TRANS-PLAN
Transportation Engineering

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Company portfolio: Trans-Plan Project Experience
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Head office: 785 Dundas Street West, Toronto, Ontario M6J 1V2

From: Donson Chan <Donson.Chan@barrie.ca>
Sent: Tuesday, June 21, 2022 2:00 PM
To: Jing Min <Jing.Min@trans-plan.com>; Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Subject: RE: 535 Bayfield St

Hi Jing,

For the parking study, we recommend the applicant review additional proxy sites that reflect the scale and nature of the proposed development; review of weekday (daytime and evening) and weekend peak demand; transportation demand management (such as unbundling parking stalls, access to transit, pre-purchased transit passes, car share, active transportation).

Hope this answers your question.

Please feel free to contact me if you have any questions or concerns.

Kind regards,

Donson Chan, P.Eng.
Transportation Engineer – Infrastructure and Growth Management, Development Services
The City of Barrie
Mobile 249-733-5355
Please consider the environment before printing this email.

From: Jing Min <Jing.Min@trans-plan.com>
Sent: Tuesday, June 21, 2022 11:23 AM
To: Andrew Gameiro <Andrew.Gameiro@barrie.ca>; Donson Chan <Donson.Chan@barrie.ca>
Subject: Re: 535 Bayfield St

Thanks Andrew!

Hi Donson,

We are working on a parking study for a redevelopment located in 535 Bayfield Street. A copy of site plan is attached for your information.

Please see the email below, Andrew has provided a list of comparable developments (recently approved but built yet). Is a comparison/review of parking supply at these sites sufficient for our parking study? We wanted to confirm if parking utilization surveys at existing proxy site(s) are required.

Kindly let us know if there are other requirements for the parking study.

Thank you,

Jing Min
Traffic Analyst | TRANS-PLAN
Transportation Engineering

Toll Free: +1 (877) 668-8784 (TPTI)
Office/Fax: +1 (647) 931-7383 Ext:128
Cell: +1 (226) 978-3203
Email: jing.min@trans-plan.com
W: www.trans-plan.com

Company portfolio: Trans-Plan Project Experience
Asset Management: AssetCity
Head office: 785 Dundas Street West, Toronto, Ontario M6J 1V2

From: Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Sent: Tuesday, June 21, 2022 8:45 AM
To: Jing Min <Jing.Min@trans-plan.com>
Cc: Cesare Pittelli <cpittelli@evansplanning.com>; Donson Chan <Donson.Chan@barrie.ca>
Subject: RE: 535 Bayfield St

Hi All,

Please direct questions regarding parking study requirements to Donson Chan (copied on this email).

Kind regards,

Andrew Gameiro, BES, RPP
Senior Planner
Development Services Department

City of Barrie: City Hall, 70 Collier Street, P.O. Box 400, Barrie ON, L4M 4T5
Ext. 5038
www.barrie.ca

From: Jing Min <Jing.Min@trans-plan.com>
Sent: Monday, June 20, 2022 5:11 PM
To: Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Cc: Cesare Pittelli <cpittelli@evansplanning.com>
Subject: Re: 535 Bayfield St

Hi Andrew,

Thank you for all the information.

Looks like the developments listed have not been built yet. I wanted to confirm if parking utilization survey at 1-2 existing proxy sites (that are actually in operation) is required, or only a comparison/review of parking supply at similar developments is.

Thank you,

Jing Min
Traffic Analyst | TRANS-PLAN
Transportation Engineering

Toll Free: +1 (877) 668-8784 (TPTI)
Office/Fax: +1 (647) 931-7383 Ext:128
Cell: +1 (226) 978-3203

Email: jing.min@trans-plan.com
W: www.trans-plan.com

Company portfolio: Trans-Plan Project Experience
Asset Management: AssetCity
Head office: 785 Dundas Street West, Toronto, Ontario M6J 1V2

From: Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Sent: Wednesday, June 15, 2022 1:21 PM
To: Jing Min <Jing.Min@trans-plan.com>; Cesare Pittelli <cpittelli@evansplanning.com>
Cc: Adam Layton <alayton@evansplanning.com>
Subject: RE: 535 Bayfield St

Hi All,

Proxy sites can be found on the City's Proposed Developments webpage.

I recommend looking at sites located in the City's Intensification Corridors, which include Dunlop Street, Yonge Street, Bayfield Street and Essa Road. Some of these projects are active, while some have been approved and can be found under the 'Approved Developments' section of the webpage.

Some comparable projects include – 430 Essa Road (D11-23-2017), 440 Essa Road (D11-027-2020), 290-302 Georgian Drive (D14-1673, OPA 74 & D11-008-2019), 681 & 685 Yonge Street (D11-013-2019), 521 & 525 Essa Road (D11-015-2018).

Kind regards,

Andrew Gameiro, BES, RPP
Senior Planner
Development Services Department

City of Barrie: City Hall, 70 Collier Street, P.O. Box 400, Barrie ON, L4M 4T5
Ext. 5038
www.barrie.ca

From: Jing Min <Jing.Min@trans-plan.com>
Sent: Wednesday, June 15, 2022 11:48 AM
To: Cesare Pittelli <cpittelli@evansplanning.com>; Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Cc: Adam Layton <alayton@evansplanning.com>
Subject: Re: 535 Bayfield St

Good morning, Andrew,

I'm just following up with the inquiry below.

Let me know if you have any questions.

Thank you,

Jing Min
Traffic Analyst | TRANS-PLAN
Transportation Engineering

Toll Free: +1 (877) 668-8784 (TPTI)
Office/Fax: +1 (647) 931-7383 Ext:128
Cell: +1 (226) 978-3203
Email: jing.min@trans-plan.com
W: www.trans-plan.com

Company portfolio: Trans-Plan Project Experience
Asset Management: AssetCity
Head office: 785 Dundas Street West, Toronto, Ontario M6J 1V2

From: Cesare Pittelli <cpittelli@evansplanning.com>
Sent: Friday, May 27, 2022 3:24 PM
To: Andrew Gameiro <Andrew.Gameiro@barrie.ca>
Cc: Adam Layton <alayton@evansplanning.com>; Jing Min <Jing.Min@trans-plan.com>
Subject: 535 Bayfield St

Hi Andrew,

Hope all is well.

I would like to follow up on the conversation we had at the PAC meeting regarding the similar proxy sites you had mentioned for the parking study. I believe you said that you were going to send us those addresses to have a look. Can you kindly do so? I have copied Jing, our transportation consultant, to this email as well.

Thank you,

--
Cesare Pittelli
Associate Planner

Evans Planning
****NEW ADDRESS EFFECTIVE MARCH 1, 2022****
9212 Yonge Street, Unit 1
Richmond Hill, Ontario
L4C 7A2
Ph:(905) 669-6992 x 104

Caution: This is an external email, please take care when clicking links or opening attachments.

APPENDIX F

Parking Survey Results

Parking Utilization Survey

Location: 531 Bayfield Street, Barrie
Count Date: Thursday, August 4, 2022
Location: All accesses combined and the north strip of Gerogain Mall

start time	Back and South		Front		Total		On-Site Demand	North Strip of Georgian Mall	Total
	In	Out	In	Out	In	Out	15		
10:00	29	37	26	13	55	50	20		
10:30	49	40	23	17	72	57	35		
11:00	31	42	20	13	51	55	31		
11:30	46	47	21	24	67	71	27		
12:00	34	35	28	27	62	62	27		
12:30	54	37	25	35	79	72	34	7	41
13:00	43	46	32	20	75	66	43	6	49
13:30	51	56	28	26	79	82	40	8	48
14:00	29	41	30	24	59	65	34	9	43
14:30	38	37	23	21	61	58	37	7	44
15:00	42	52	27	25	69	77	29		
15:30	41	49	35	32	76	81	24		
16:00	52	44	31	30	83	74	33		
16:30	55	60	35	35	90	95	28		
17:00	48	40	25	37	73	77	24		
17:30	57	53	32	32	89	85	28		
18:00	43	42	29	36	72	78	22		
18:30	41	47	26	23	67	70	19		
19:00	35	40	23	23	58	63	14		
19:30	33	28	25	24	58	52	20		

Parking Utilization Survey

Location: 531 Bayfield Street, Barrie
Count Date: Saturday, August 6, 2022
Location: All accesses combined and the north strip of Gerogain Mall

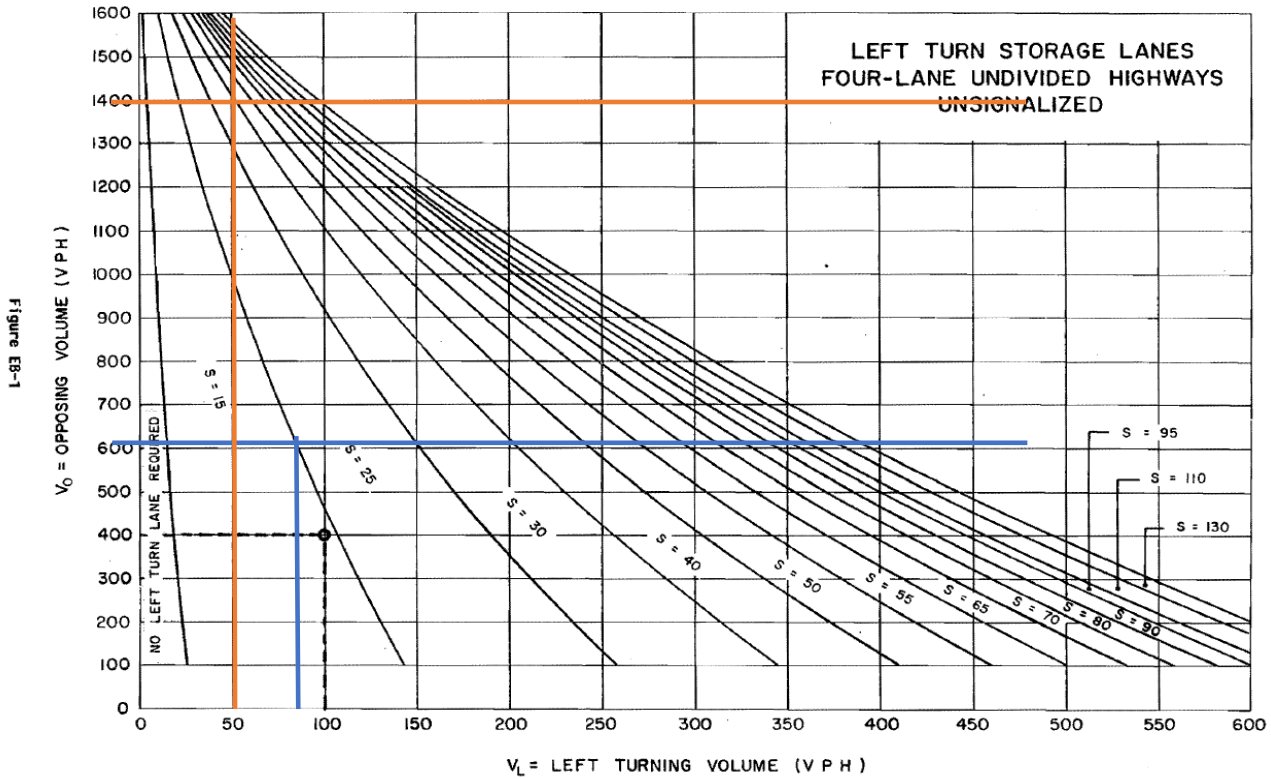
start time	Back and South		Front		Total		On-Site Demand	North Strip of Georgian Mall	Total
	In	Out	In	Out	In	Out			
10:00	38	33	27	35	65	68	24		
10:30	24	33	27	21	51	54	21		
11:00	32	31	24	15	56	46	18		
11:30	36	46	30	22	66	68	28	5	33
12:00	49	45	36	40	85	85	26	7	33
12:30	53	49	33	27	86	76	26	7	33
13:00	33	47	44	36	77	83	36	10	46
13:30	52	63	37	29	89	92	30	7	37
14:00	45	43	25	28	70	71	27	9	36
14:30	44	47	31	28	75	75	26		
15:00	26	35	28	18	54	53	26		
15:30	40	40	23	28	63	68	27		
16:00	39	42	30	25	69	67	22		
16:30	47	52	23	25	70	77	24		
17:00	47	47	19	20	66	67	17		
17:30	44	36	23	34	67	70	16		

APPENDIX G

Turn Lane Warrant Analysis

Left Turn Lane Warrant: Bayfield St & Site Access

Posted limit **50 km/hr**



Source: Ontario Geometric Design Manual, Part E, Left Turn Lane Warrants for 4-lane, Undivided Highways

Time of day	Advancing Volume	Opposing volume	Left turn volume	% Left turns	Left turn lane
AM	1023	604	79	8%	15
PM	1084	1407	52	5%	40

Time of day	Advancing Volume	Opposing volume	Left turn volume	% Left turns	Left turn lane
AM	1023	604	79	8%	15
PM	1084	1407	52	5%	40

TRANS-PLAN
transportation engineering

E.8 RIGHT TURN LANES AT CHANNELIZED INTERSECTIONS

Right turn lanes forming channelized intersections may be constructed when the following criteria apply:

- right turning traffic volumes for the design hour is 60 vehicles per hour or more,
- property is readily available,and
- the terminal points of the deceleration/ acceleration lanes do not conflict with any adjacent commercial development.

In congested urban areas, the right turn directional island is considered to be of little value since the vehicles on the ramp have difficulty merging with the traffic on the intersecting road when that traffic is moving on its green signal phase.

Conflicts can occur between vehicles and pedestrians at these high volume locations, leading to the conclusion that right turn directional islands should not be constructed at such locations. However, in those areas where there may be some pedestrian traffic, the right turn channelization island has a definite bearing on the need for, and operation of, traffic signals.

E.8.1 DECELERATION TAPER

A deceleration taper is provided in advance of a separate turn lane or ramp at channelized intersection permitting a gradual change in speed from that of the highway to that of the channelized ramp alignment, see Figure E8-1.

The taper form is used where the required deceleration length is equal to or less than 180 m, see Table E8-1. When the deceleration length exceeds 180 m, a parallel lane with taper design is used.

The length of deceleration taper is measured to the bullnose and varies directly with the speed on the highway and inversely to the speed of the ramp. The adjustment for the grade must be applied as outlined in Section E.8.5.

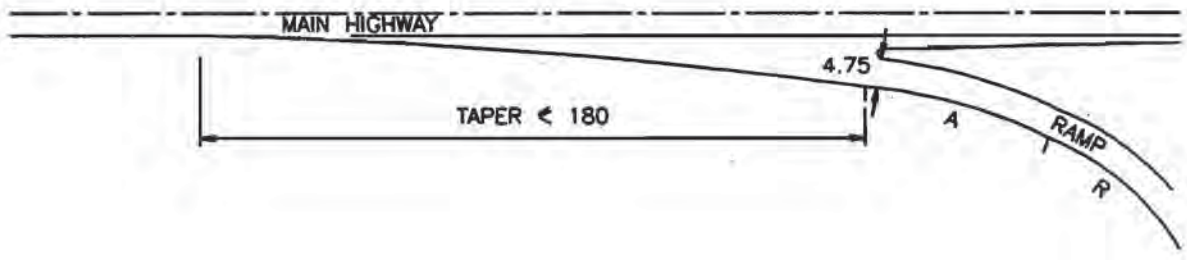


Figure E8-1

Deceleration Taper at Channelized Intersections