TRAFFIC BRIEF

September 2025

Proposed Change of Use to
Supermarket/Grocery
1881 Fairview Street,
Burlington, ON

Prepared for

Amalie Holdings Limited



TRANS-PLAN
Transportation Engineering

67 Mowat Ave, Suite 331
Toronto, ON M6K 3E3

1 (647) 931 7383
1 (877) 668 8784

trans-plan.com
admin@trans-plan.com

TRANS-PLAN

67 Mowat Ave, Suite 331
Toronto, ON M6K 3E3

1 (877) 668 8784
1 (647) 931 7383

admin@trans-plan.com
trans-plan.com

September 11, 2025

Amalie Holdings Limited
Michael Tylman

Re: <u>Proposed Change of Use for Existing Commercial Development at 1881 Fairview Street, Burlington, ON – Traffic Brief</u>

Dear Mr. Tylman,

TRANS-PLAN is pleased to submit this Traffic Impact Brief in support of the proposed change of use to a supermarket at 1881 Fairview Street, Burlington. The unit to be replaced is currently occupied by a retail company.

Our study findings indicate that the proposed land use change will have minimal impact on the surrounding road network. While some individual movements are already over capacity and experiencing delays—conditions expected to continue—overall intersection performance remains acceptable, except at Brant Street and Fairview Street under future conditions. Notably, the proposed change is not the primary cause, as existing traffic volumes are already near capacity.

Sincerely,





Anil Seegobin, P.Eng.
Partner, Principal Engineer
Trans-Plan Transportation Inc.
Transportation Consultants

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Transmittal Letter

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1. INTRODUCTION

TRANS-PLAN has been retained to complete a Traffic Brief for a proposed change of use for the existing commercial development at 1881 Fairview Street, in Burlington. This study includes the following components and tasks:

Traffic Brief

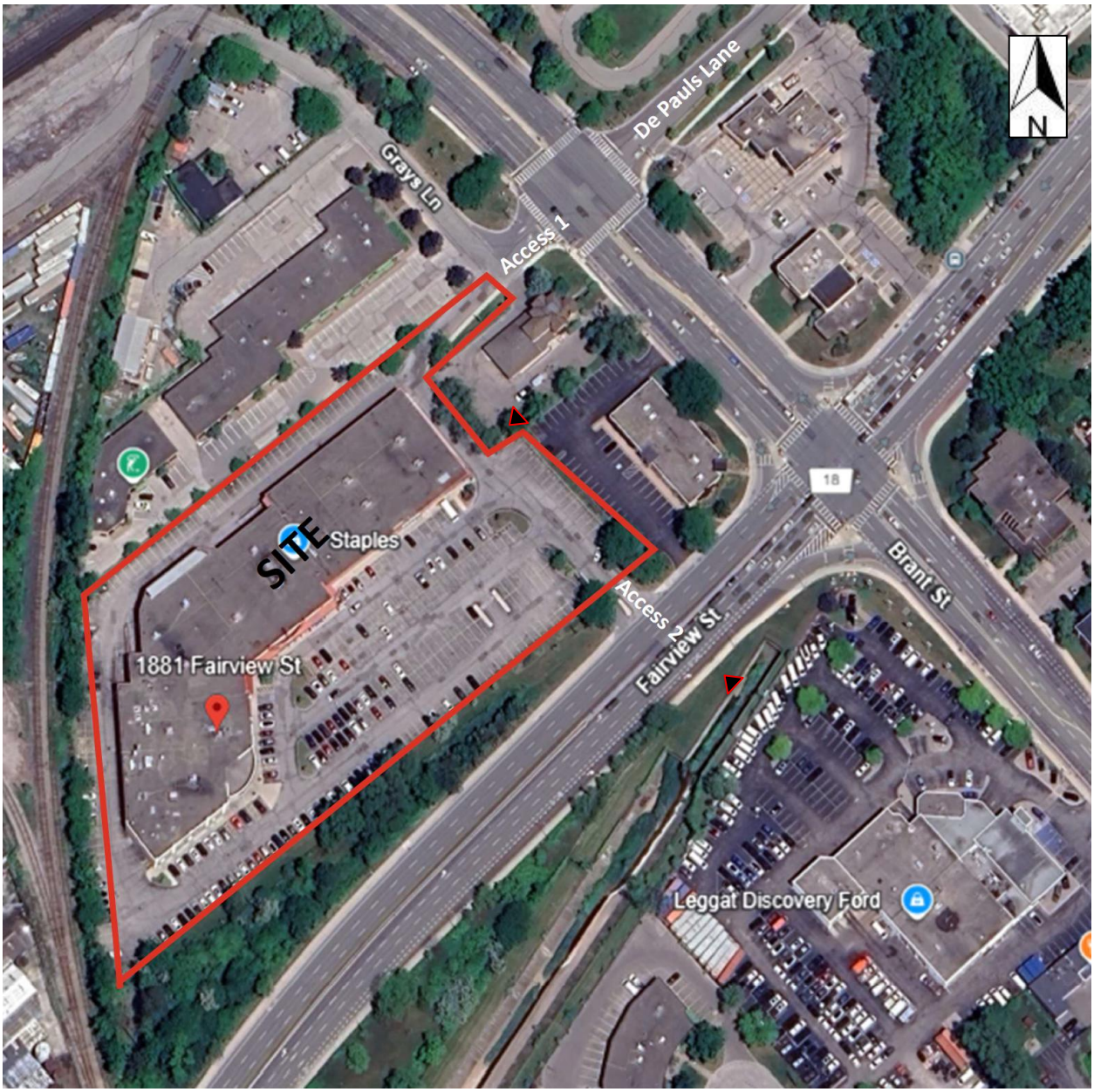
- A review and assessment of the existing road network
- A review of the site context and development proposal
- An assessment of the impact of site-generated traffic (auto, transit, cycling, and walking trips) on the adjacent roadway network under existing traffic conditions before and after site traffic is added to the network
- Determination of roadway and intersection improvements and transit and pedestrian/cycling infrastructure improvements, if required, to accommodate the proposed development

2. STUDY AREA CONTEXT

2.1 Site Location

The site is located at 1881 Fairview Street, Burlington, located west of Brant Street and Fairview Street, as shown in Figure 1. The property is currently occupied by a one-storey retail building with access to the property at Brant Street and along Fairview Street. The property offers 315 parking spaces.

Figure 1 – Site Location



Source: Google Maps

2.2 Road Network

The study area roadways in the immediate site vicinity are as follows:

Brant Street (Halton Regional Road 18) is a regional roadway maintained by the Halton Region. It runs north–south and has a posted speed limit of 50 km/h near the study area. The road consists of three lanes in each direction, including dedicated lanes for both left and right turns.

Fairview Street is a major arterial road under the jurisdiction of the Halton Region. It runs west–east and generally provides three through lanes in each direction, with tapered dedicated turn lanes at the intersection with Brant Street. The posted speed limit is 60 km/h.

De Pauls Lane is a local residential roadway located adjacent to the study site. It runs east-west with three lanes – one in each direction and one dedicated left turn lane. It provides direct access to nearby residential properties and connects to Fairview Street. The roadway operates at low volumes with a typical residential speed environment. It has a posted speed limit of 15 km/h.

Grays Lane is a local roadway that directly connects to the subject site, serving as one of the site's primary access points. It connects to De Pauls Lane and primarily serves the nearby residential. It provides local access and operates at low traffic volumes with a low posted speed limit. The roadway accommodates a dedicated left turn and functions solely as a local access street. It is assumed to have a speed limit of 40 km/h.

3. EXISTING CONDITIONS

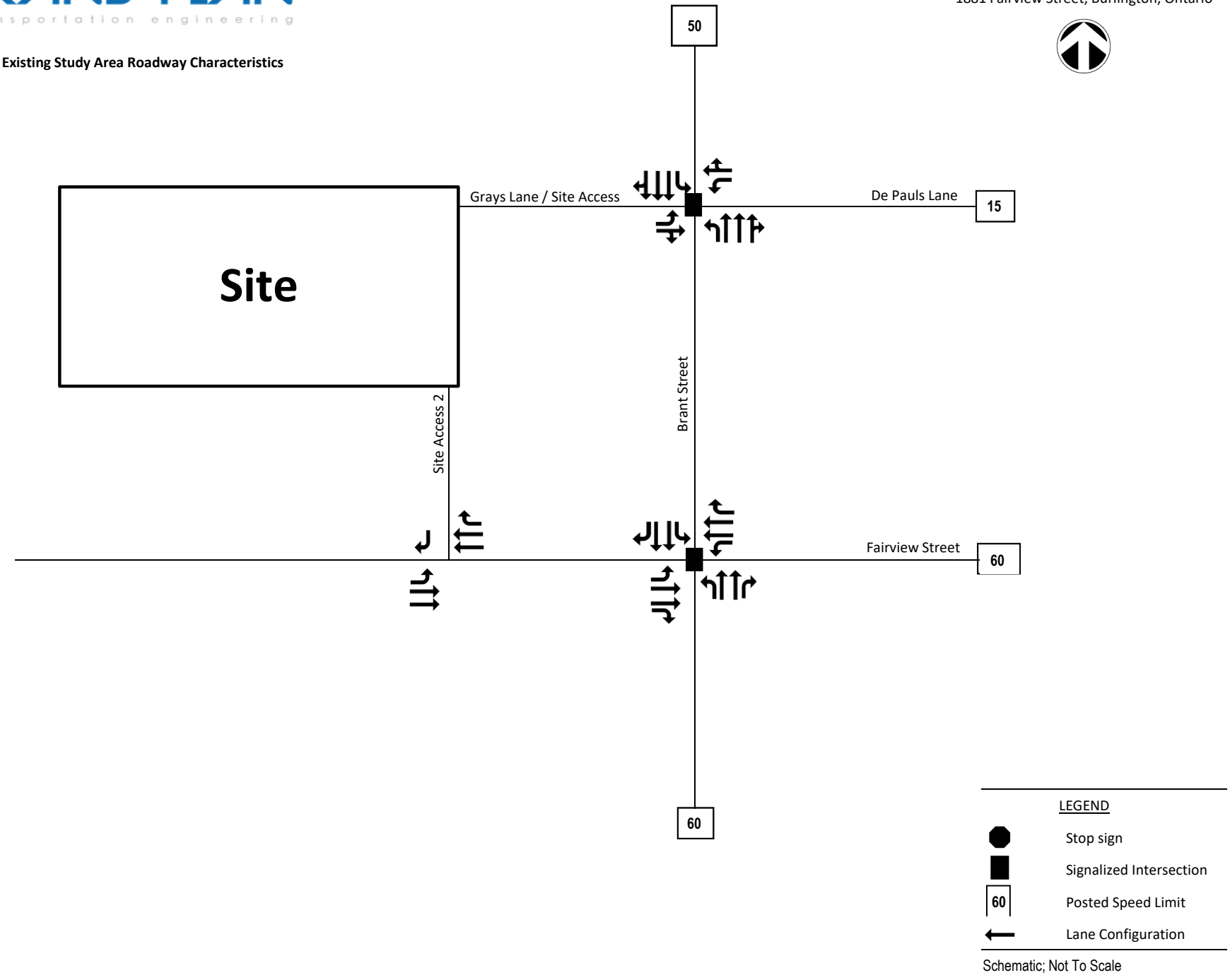
3.1 Study Area Intersections and Driveways

The study area intersections and driveways reviewed in our analysis are as follows:

1. Brant Street & De Pauls Lane/Grays Lane
2. Brant Street & Fairview Street
3. Fairview Street & Site Access 1

These intersections were included as per the correspondence with the Town. The existing study area roadway characteristics are shown in Figure 2.

Figure 2: Existing Study Area Roadway Characteristics



3.2 Traffic Counts

TRANS-PLAN conducted fresh intersection turning movement counts (TMCs) on Tuesday, August 19, 2025, for the study area roadways. Table 1 provides a summary of the count and peak hours obtained for each intersection counted. Since recent traffic counts were not available for the Saturday peak hour, this study relied on historical data from a previous Traffic Impact Assessment[1]. The Saturday peak hour volumes were estimated by applying the ratio of Saturday peak hour to PM peak hour volumes—based on the previous TIA—to the current PM peak hour counts collected by Trans-Plan. Detailed Turning Movement Count (TMC) data are provided in Appendix A.

Table 1 – Intersection Turning Movement Counts

Location	Count Date	Count Hours
Brant Street & De Pauls Lane/Grays Lane	Tuesday, August 19, 2025	7:00 am – 9:30 am 2:00 pm – 6:30 pm
Brant Street & Fairview Street	Tuesday, August 19, 2025	7:00 am – 9:00 am 3:00 pm – 6:00 pm
Fairview Street & 1881 Fairview Street	Tuesday, August 19, 2025	7:00 am – 9:30 am 2:00 pm – 6:30 pm

4. SITE TRAFFIC

4.1 Auto Trip Generation

Vehicle site trips for the proposed supermarket were generated using the Institute of Transportation Engineers (ITE) Trip Generation manuals, 11th Edition. These standards are widely accepted and used to generate site trips for new developments throughout Canada. The following Land Use Code (LUC) was utilized:

- LUC 850 for Supermarket
- LUC 822 for Strip Retail

Table 2 summarizes the trip generation for the proposed land use (Supermarket) compared to the existing land use (Strip Retail Plaza). The existing trips are deducted from the proposed trips to estimate the net future trip generation. Based on this analysis, the proposed Supermarket is expected to generate approximately 71 new two-way trips during the weekday AM peak hour, 247 new two-way trips during the weekday PM peak hour, and 339 new two-way trips during the Saturday peak hour.

[1] *Traffic Impact Assessment for Mixed-use Development*, prepared by Paradigm Transportation Solutions Limited, dated May 2021.

Table 2 - Site Trip Generation for Each Proposed Use

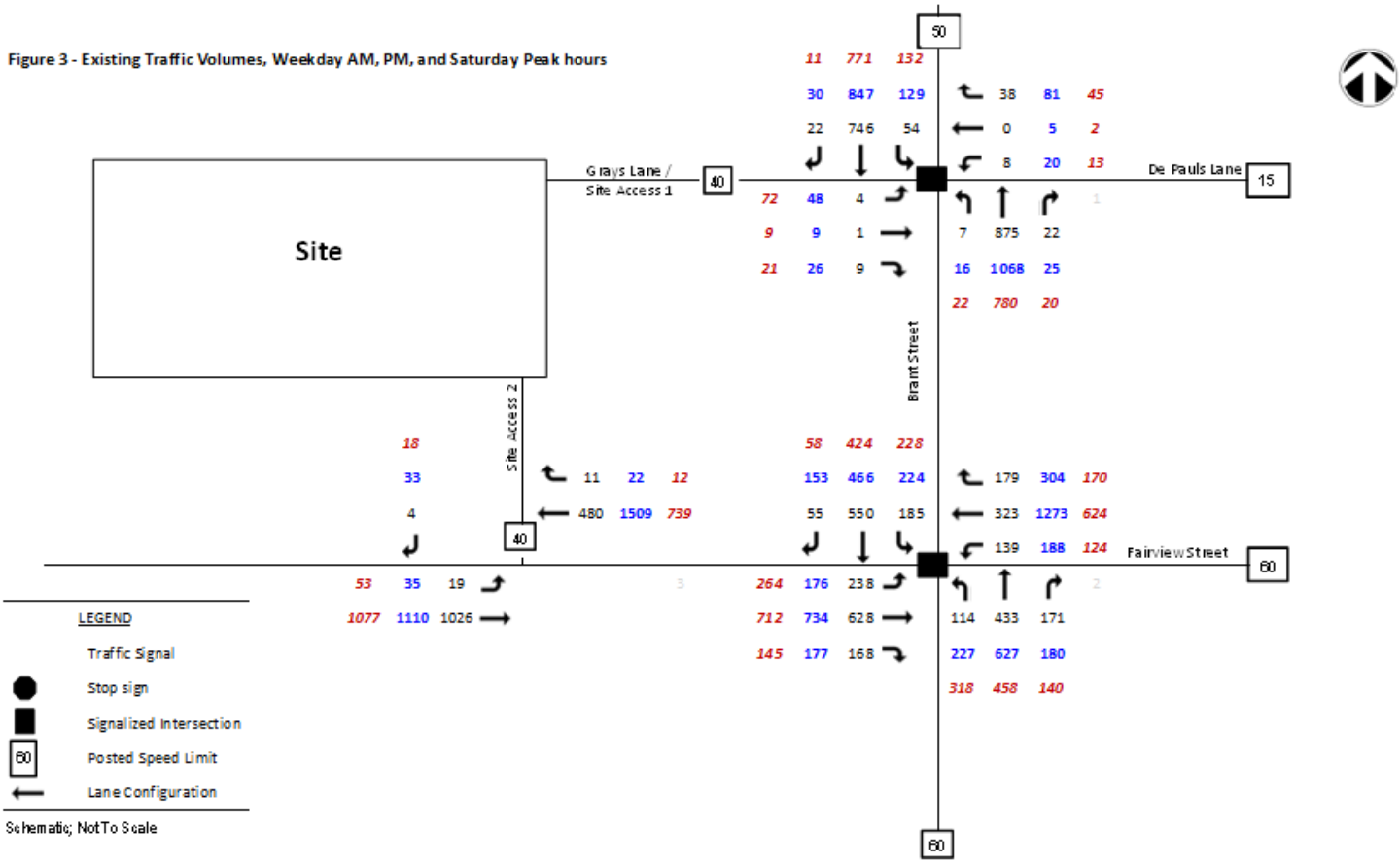
Land Use	GFA		Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Super-market (LUC 850)	41.05	Dir. Distr.	59%	41%	100%	50%	50%	100%	42%	58%	100%
		Equation	n/a			Ln(T) = 0.81Ln(X) + 2.92			Ln(T) = 0.74Ln(X) + 3.41		
		Rate	1.68	1.17	2.85	2.67	6.49	9.16	1.51	10.01	11.52
		Trips	**69**	**48**	**117**	**188**	**188**	**376**	**236**	**237**	**473**
Trip Reduction for change of land use											
Strip Retail Plaza (LUC 822)	20.32	Dir. Distr.	60%	40%	100%	50%	50%	100%	51%	49%	100%
		Equation	Ln(T) = 0.66Ln(X) + 1.84			Ln(T) = 0.71Ln(X) + 2.72			n/a		
		Rate	5.90	3.64	2	1.51	4.84	6.35	3.35	3.24	6.59
		-Trips	**28**	**18**	**46**	**64**	**65**	**129**	**68**	**66**	**134**
Total Trips			**41**	**30**	**71**	**124**	**123**	**247**	**168**	**171**	**339**

5. CAPACITY ANALYSIS

5.1 Existing Conditions

The existing traffic volumes for the weekday AM, weekday PM, and Saturday peak hours are shown in Figure 3.

Figure 3 – Existing Traffic Volumes, Weekday AM and PM Peak Hours



A capacity analysis was undertaken for the study area intersection using Synchro 11 analysis software. Capacity Analysis Sheets are provided in Appendix B. The results of the analysis are shown in Table 3.

Table 3 – Capacity Analysis Results, Existing Conditions

Intersection	Existing Traffic Conditions								
Movement	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Brant Street & De Pauls/Grays Lane	**0.30**	**5.2**	**A**	**0.50**	**27**	**C**	**0.35**	**9**	**A**
Eastbound Left	0.05	39	D	0.45	42	D	0.57	43	D
Eastbound Through / Right	0.02	39	D	0.08	38	D	0.10	36	D
Westbound Left	0.10	40	D	0.17	39	D	0.10	36	D
Westbound Through / Right	0.03	39	D	0.08	38	D	0.04	36	D
Northbound Left	0.02	4	A	0.04	6	A	0.08	7	A
Northbound Through / Right	0.32	6	A	0.36	8	A	0.31	8	A
Southbound Left	0.14	2	A	1.55	338	F	0.3	4	A
Southbound Through / Right	0.22	2	A	0.22	3	A	0.24	3	A
Brant Street & Fairview Street	**0.64**	**28**	**C**	**0.91**	**50**	**D**	**0.87**	**35**	**C**
Eastbound Left	0.60	22	C	0.94	75	E	0.84	40	D
Eastbound Through	0.71	33	C	0.68	36	D	0.70	34	C
Eastbound Right	0.12	26	C	0.12	28	C	0.10	26	C
Westbound Left	0.60	29	C	0.65	26	C	0.57	31	C
Westbound Through	0.45	32	C	1.07	82	F	0.82	44	D
Westbound Right	0.13	29	C	0.25	26	C	0.12	32	C
Northbound Left	0.34	19	B	0.64	30	C	0.89	49	D
Northbound Through	0.46	29	C	0.74	46	D	0.50	33	C
Northbound Right	0.12	25	C	0.13	35	C	0.10	28	C
Southbound Left	0.47	18	B	0.75	37	D	0.62	23	C
Southbound Through	0.55	29	C	0.56	41	D	0.40	28	C
Southbound Right	0.04	22	C	0.11	34	C	0.04	24	C
Fairview Street & 1881 Fairview									
Eastbound Left	0.02	8	A	0.07	13	B	0.06	9	A
Eastbound Through	0.33	0	A	0.35	0	A	0.35	0	A
Westbound Through	0.16	0	A	0.47	0	A	0.24	0	A
Westbound Right	0.01	0	A	0.01	0	A	0.01	0	A
Southbound Right	0.00	9	A	0.07	12	B	0.02	9	A

At Brant Street & De Pauls/Grays Lane, overall operations are acceptable, with the intersection functioning at Level of Service (LOS) A to C across all time periods. However, a significant concern is observed with the southbound left turn movement during the PM peak hour, which exhibits a very high volume-to-capacity (v/c) ratio of 1.55, accompanied by a delay of 338 seconds and LOS F, indicating severe congestion, while the rest of the intersection performs well.

At Brant Street & Fairview Street, the PM peak hour again presents notable capacity and performance issues. The overall intersection operates at LOS D during the PM peak, and certain movements contribute heavily to this decline. The eastbound left turn during the PM peak shows a high v/c of 0.94 with a delay of 75 seconds, resulting in LOS E, suggesting that this movement is nearing capacity and experiencing notable delay. Additionally, the westbound through movement shows signs of operational failure with a v/c ratio of 1.07 and a delay of 82 seconds, yielding LOS F, pointing to substantial queuing and delay. The northbound left turn also becomes problematic during the Saturday peak hour, with a v/c of 0.89 and a delay of 49 seconds, indicating LOS D and showing growing pressure on that approach.

In contrast, the Fairview Street & 1881 Fairview intersection operates very efficiently across all time periods. The highest delays are recorded at the eastbound left and southbound right movements during the PM peak hour, both showing minor delays (13 and 12 seconds, respectively), with LOS B, which still represents good performance. No movements at this intersection exceed a v/c ratio of 0.47, and all maintain LOS A or B.

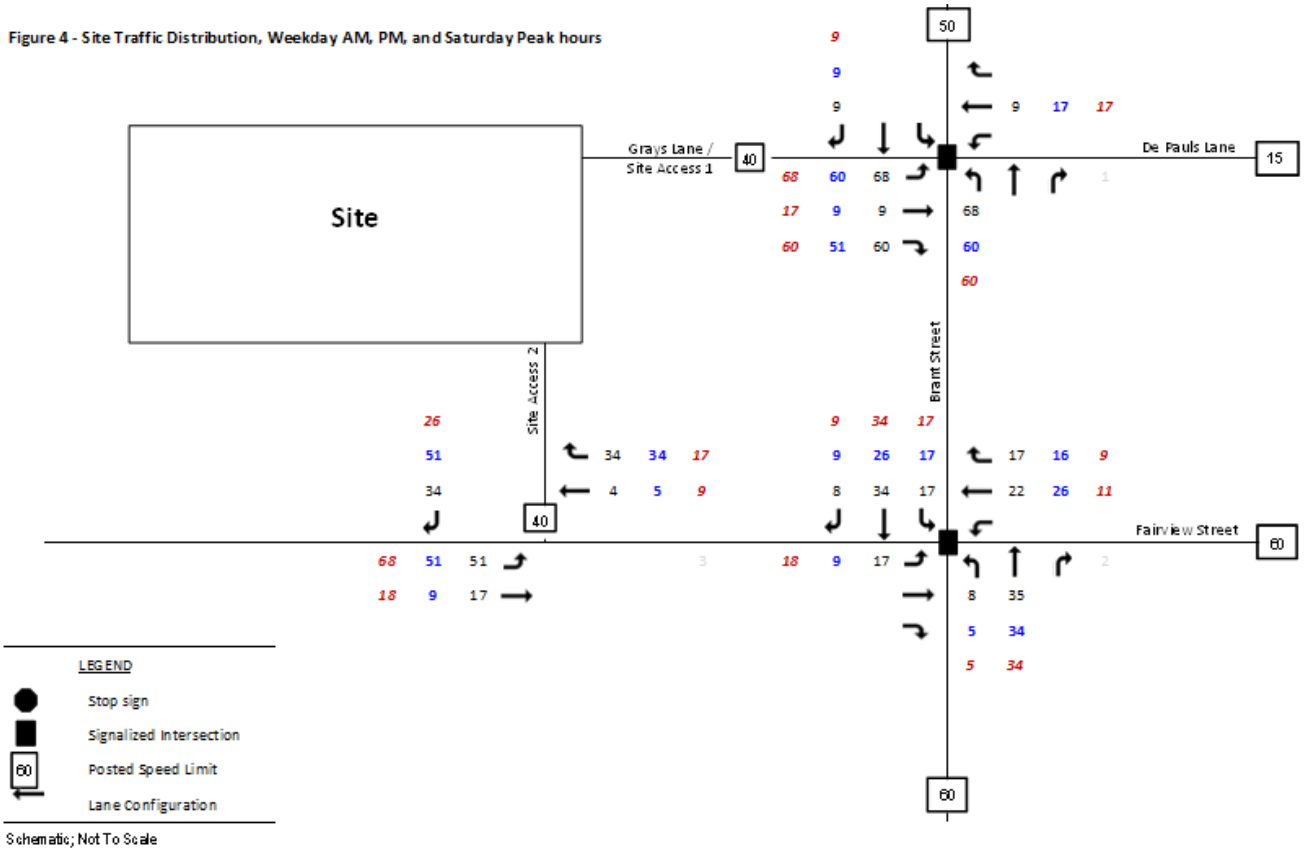
Overall, while most movements at the intersections studied perform well, there are emerging capacity and congestion concerns during the PM peak hour at Brant Street & Fairview Street and a critical failure in the southbound left turn at Brant Street & De Pauls/Grays Lane. These locations may warrant targeted mitigation or further study. During the existing conditions, all movements operate at an acceptable LOS of B or better during the weekday AM and PM peak hours. Source information for the Level of Service (LOS) Definition for unsignalized intersections is provided in Appendix C.

5.2 Future Conditions

The traffic volumes in the study area were analyzed to determine the directional distribution of site-generated trips. During the weekday AM, weekday PM, and Saturday peak hours, the majority of traffic travels northbound and southbound via the site access on Grays Lane, and westbound via the site access on Fairview Street.

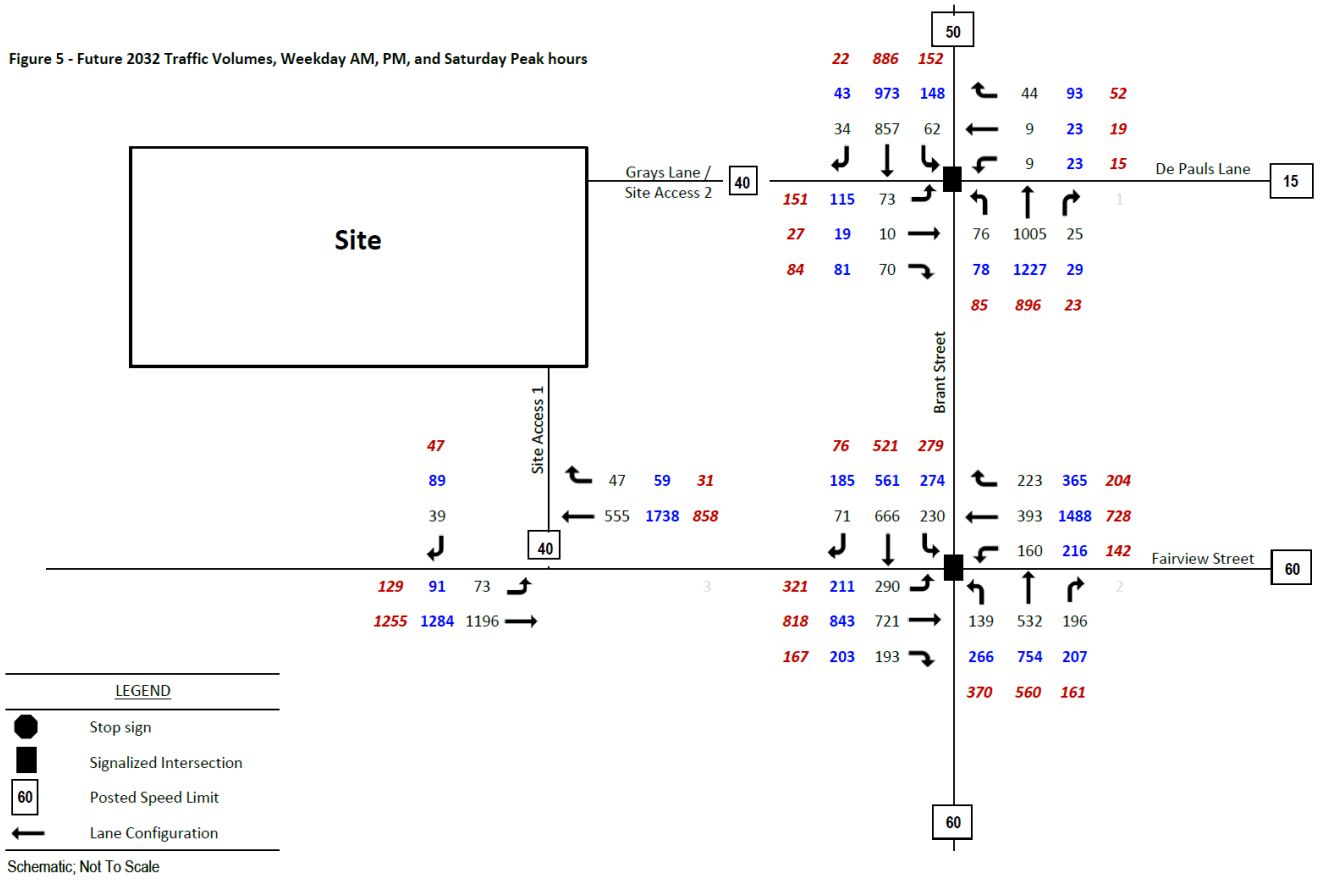
Based on this analysis, the distribution of site traffic assignments is detailed in Figure 4.

Figure 4 – Site Traffic Distribution, Weekday AM and PM Peak Hours



A two percent annual growth rate was applied to the existing traffic conditions to project the traffic conditions for the horizon year within the study area. Total future site traffic volumes are provided in Figure 5.

Figure 5 – Future 2032 Traffic Volumes, Weekday AM and PM Peak Hours



Similar to the existing condition, a capacity analysis was undertaken for the study area intersection using Synchro 11 analysis software. The results are shown in Table 4, and Capacity Analysis Sheets are provided in Appendix B.

Table 4 – Capacity Analysis Results, Future Conditions

Intersection	Future Traffic Conditions								
Movement	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Brant Street & De Pauls/Grays Lane	**0.41**	**10**	**A**	**0.63**	**36**	**D**	**0.51**	**13**	**B**
Eastbound Left	0.49	39	D	0.64	45	D	0.69	44	D
Eastbound Through / Right	0.14	36	D	0.14	35	C	0.22	33	C
Westbound Left	0.06	35	D	0.12	35	C	0.07	32	C
Westbound Through / Right	0.08	35	D	0.15	35	C	0.10	32	C
Northbound Left	0.29	10	B	0.28	12	B	0.38	16	B
Northbound Through / Right	0.40	9	A	0.46	12	B	0.40	12	B
Southbound Left	0.19	4	A	1.84	464	F	0.44	7	A
Southbound Through / Right	0.27	4	A	0.28	5	A	0.30	6	A
Brant Street & Fairview Street	**0.77**	**32**	**C**	**1.09**	**80**	**F**	**1.13**	**53**	**D**
Eastbound Left	0.76	29	C	1.15	139	F	1.04	92	F
Eastbound Through	0.75	35	C	0.82	43	D	0.76	35	C
Eastbound Right	0.14	26	C	0.14	30	C	0.12	25	C
Westbound Left	0.75	38	D	0.84	49	D	0.73	39	D
Westbound Through	0.49	32	C	1.27	164	F	0.9	52	D
Westbound Right	0.16	29	C	0.36	29	C	0.15	32	C
Northbound Left	0.49	23	C	0.80	40	D	1.23	162	F
Northbound Through	0.60	34	C	0.92	60	E	0.65	39	D
Northbound Right	0.14	28	C	0.23	37	D	0.11	31	C
Southbound Left	0.66	24	C	0.92	62	E	0.87	43	D
Southbound Through	0.70	35	C	0.67	44	D	0.51	32	C
Southbound Right	0.05	25	C	0.13	35	D	0.06	26	C
Fairview Street & 1881 Fairview									
Eastbound Left	0.08	9	A	0.28	20	C	0.16	10	A
Eastbound Through	0.39	0	A	0.4	0	A	0.41	0	A
Westbound Through	0.18	0	A	0.54	0	A	0.28	0	A
Westbound Right	0.03	0	A	0.04	0	A	0.02	0	A
Southbound Right	0.04	9	A	0.18	13	B	0.06	2	A

At Brant Street & De Pauls/Grays Lane, the overall intersection performance is projected to remain acceptable during the AM and Saturday peak hours, maintaining Levels of Service A and B, respectively. However, during the PM peak hour, the intersection is expected to operate at LOS D, signaling a decline in performance due to increasing volumes. The most critical issue remains the southbound left turn movement, which deteriorates further compared to existing conditions. This movement is projected to operate at an alarming v/c ratio of 1.84, with a delay of 464 seconds and LOS F, indicating severe congestion and operational failure. This suggests that without mitigation, this movement will become a major bottleneck. All other movements at this intersection are expected to remain at LOS C or better, indicating that the southbound left turn is a highly localized but serious issue. Thus, the assessment

confirms that the trips generated by the change of land use have no impact on the major congestion of the intersection, especially the southbound left turn.

At Brant Street & Fairview Street, future conditions indicate a marked degradation in performance, particularly during the PM and Saturday peak hours. The overall intersection is projected to reach LOS F during the PM peak hour, with a v/c ratio of 1.09 and a delay of 80 seconds, and LOS D on Saturday. Several individual movements are expected to exceed capacity and experience substantial delays. Most notably, the eastbound left turn will operate at LOS F in both PM and Saturday peak hours, with v/c ratios of 1.15 and 1.04, and delays of 139 and 92 seconds, respectively. The westbound through movement also reaches LOS F during the PM peak, with a v/c of 1.27 and a delay of 164 seconds, signifying extreme congestion. Additionally, the northbound left turn during the Saturday peak is projected to become a major concern, with a v/c ratio of 1.23 and a delay of 162 seconds, again resulting in LOS F. These projections indicate significant pressure on multiple approaches, particularly during the busiest periods, and underscore the need for capacity improvements or operational changes at this intersection.

In contrast, the Fairview Street & 1881 Fairview intersection is expected to continue operating efficiently under future conditions. All movements remain within acceptable v/c thresholds, and delays are minimal. The eastbound left and southbound right turns experience only modest increases in delay during the PM peak, with the southbound right movement reaching LOS B, but no critical performance issues are anticipated.

Overall, the forecasted traffic conditions suggest that while some intersections will continue to function well, particularly Fairview Street & 1881 Fairview, both Brant Street & De Pauls/Grays Lane and Brant Street & Fairview Street are expected to experience worsening congestion. In particular, specific turning movements—such as the southbound left at De Pauls/Grays Lane and the eastbound left and westbound through at Fairview Street—are projected to reach or exceed capacity, indicating a pressing need for intervention.

6. SUMMARY AND CONCLUSIONS

This Traffic Brief, prepared in support of the proposed change of land use application to permit a supermarket to replace an existing retail currently at one of the units in the existing retail building at 1881 Fairview Street, Burlington, ON, is summarized as follows:

- The intersection analysis under existing conditions highlights significant congestion during the PM peak hour, particularly at Brant Street & Fairview Street and Brant Street & De Pauls/Grays Lane. Notably, the southbound left at De Pauls/Grays Lane operates at LOS F with extreme delays, while multiple movements at Brant & Fairview are nearing or exceeding capacity. In contrast, Fairview & 1881 Fairview functions efficiently with minimal delays across all periods.

- This analysis shows that the study site is not the primary source of future congestion, as several movements are already at or over capacity under existing conditions. For example, the southbound left at Brant & De Pauls/Grays Lane currently operates at LOS F, and Brant & Fairview experiences significant delays during the PM peak. This suggests that future congestion is mainly due to existing network limitations and general traffic growth, rather than impacts directly related to the study site.

Respectfully submitted,



Anil Seegobin, P.Eng.
Partner, Principal Engineer
Trans-Plan Transportation Inc.
Transportation Consultants

APPENDICES

Appendix A – Turning Movement Counts

Appendix B – Capacity Analysis Sheets

Appendix C – Level of Service Definitions

Appendix D – Site Plan

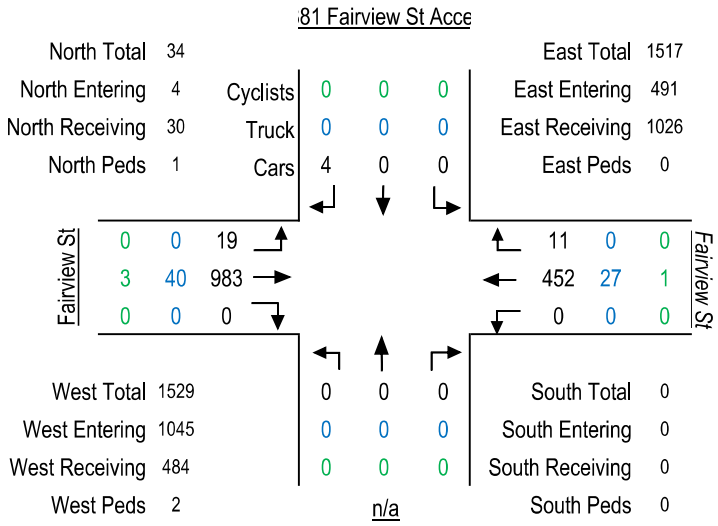
APPENDIX A

Traffic Movement Counts

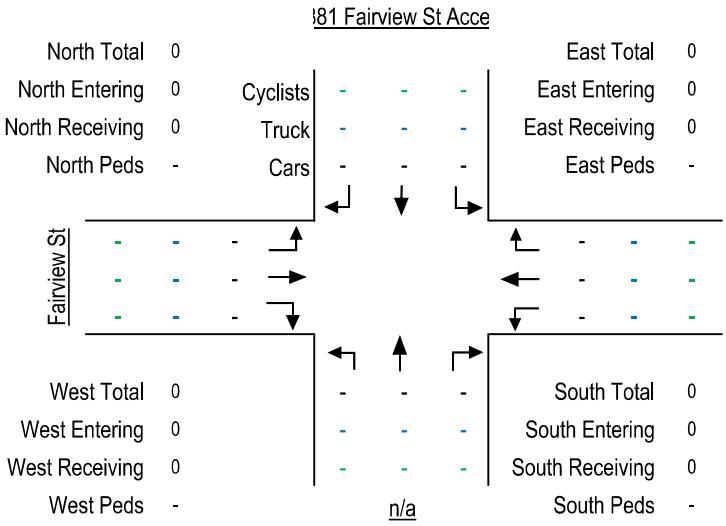
Turning Movement Count Diagram

Intersection: Brant Street and Fairview Street at Access to 1881 Fairview Street
Intersection ID:
Municipality: Burlington, Ontario
Date: Tuesday, August 19, 2025

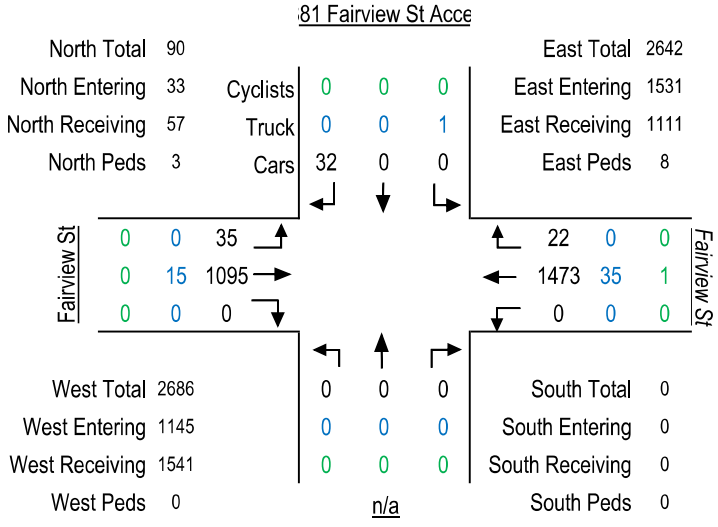
AM Peak Hour: 8:30 to 9:30



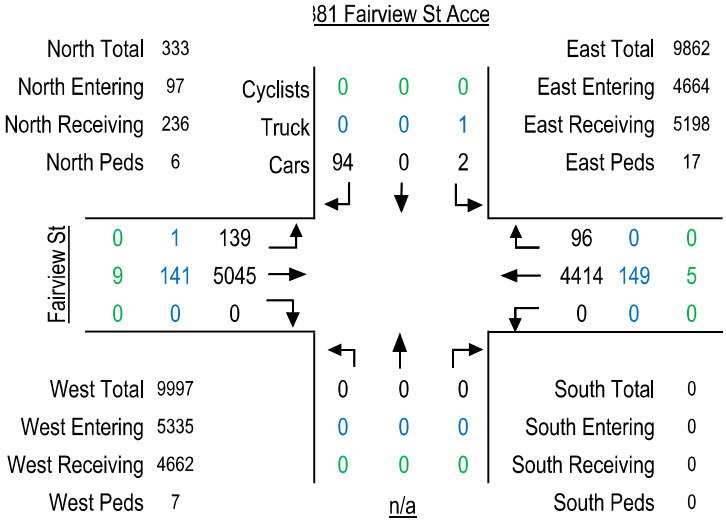
MD Peak Hour: - to -



PM Peak Hour: 16:00 to 17:00



Total 8-Hour Count



Turning Movement Count Diagram

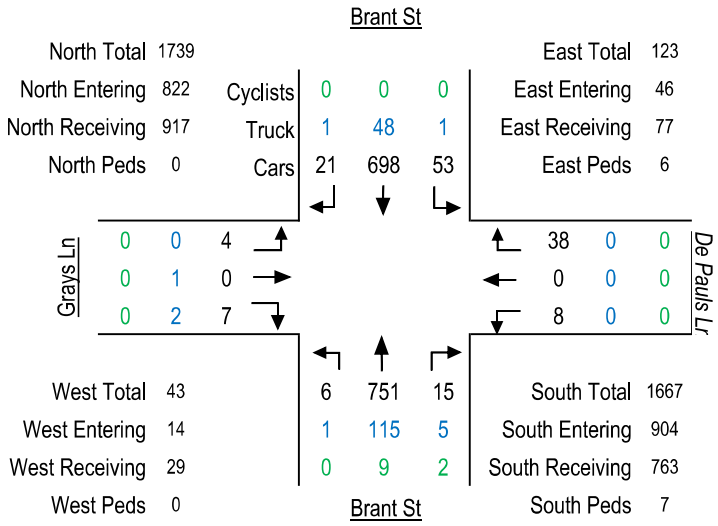
Intersection: Brant Street and De Pauls Lane / Grays Lane

Intersection ID:

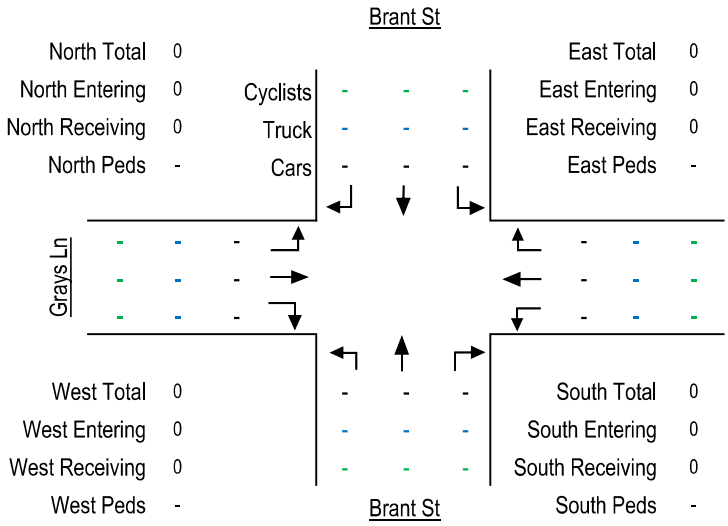
Municipality: Burlington, Ontario

Date: Tuesday, August 19, 2025

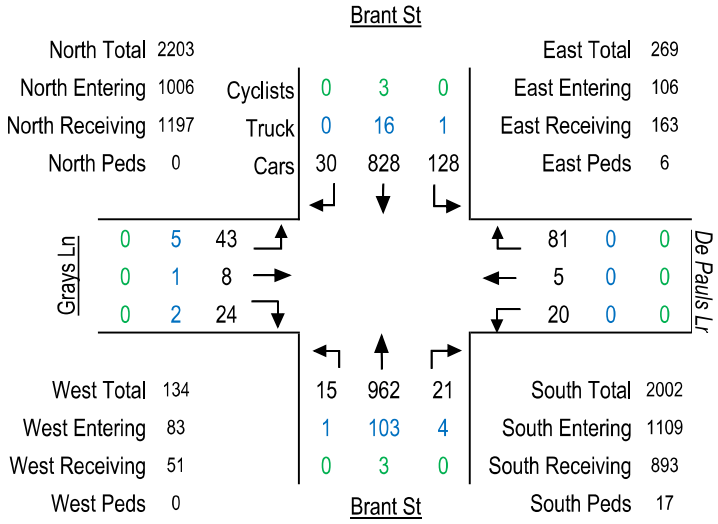
AM Peak Hour: 8:15 to 9:15



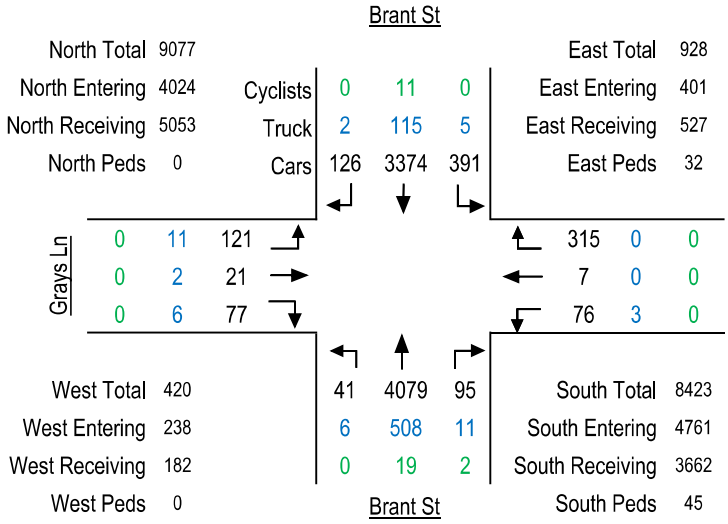
MD Peak Hour: - to -



PM Peak Hour: 17:00 to 18:00



Total 8-Hour Count



Turning Movement Count Diagram

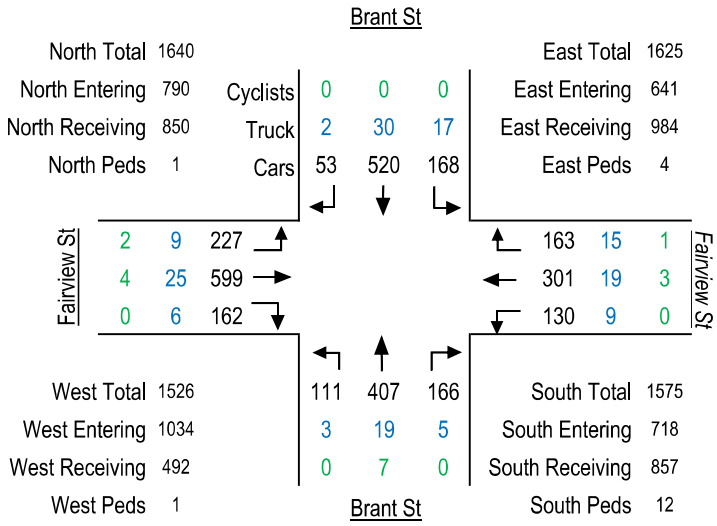
Intersection: Brant Street and Fairview Street

Intersection ID:

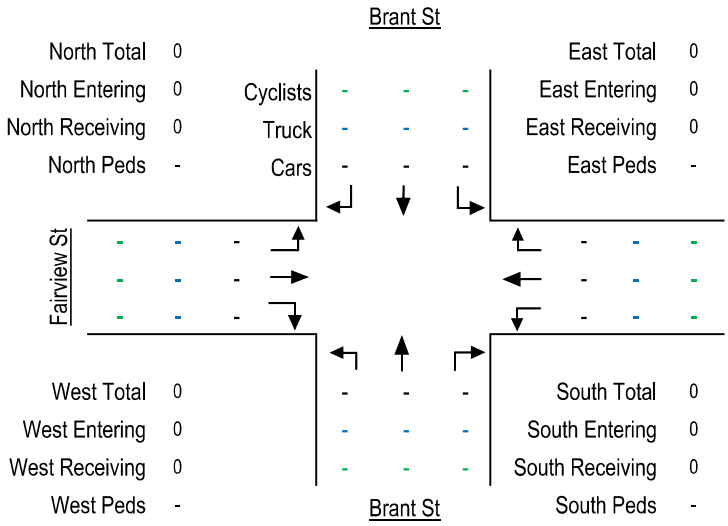
Municipality: Burlington, Ontario

Date: Tuesday, August 19, 2025

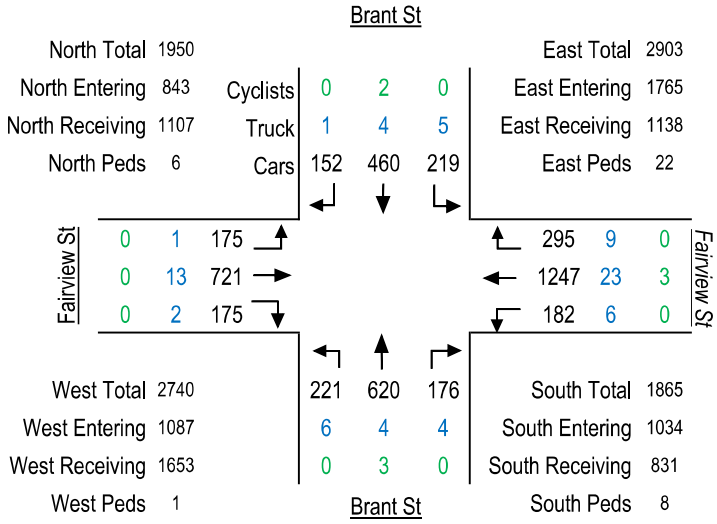
AM Peak Hour: 8:15 to 9:15



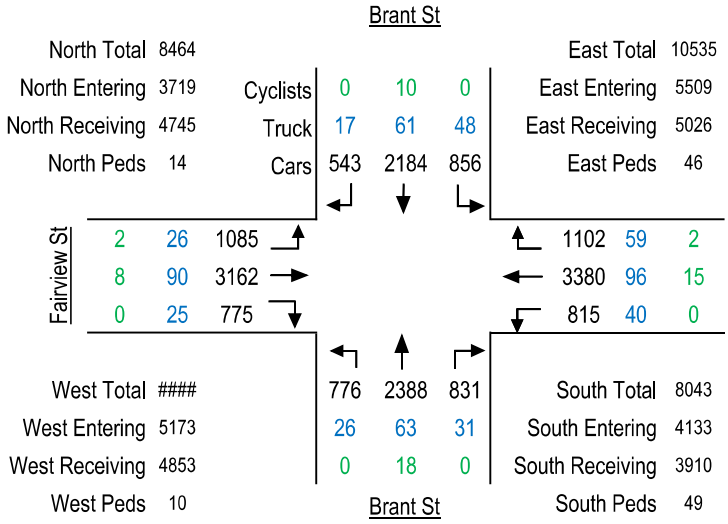
MD Peak Hour: - to -

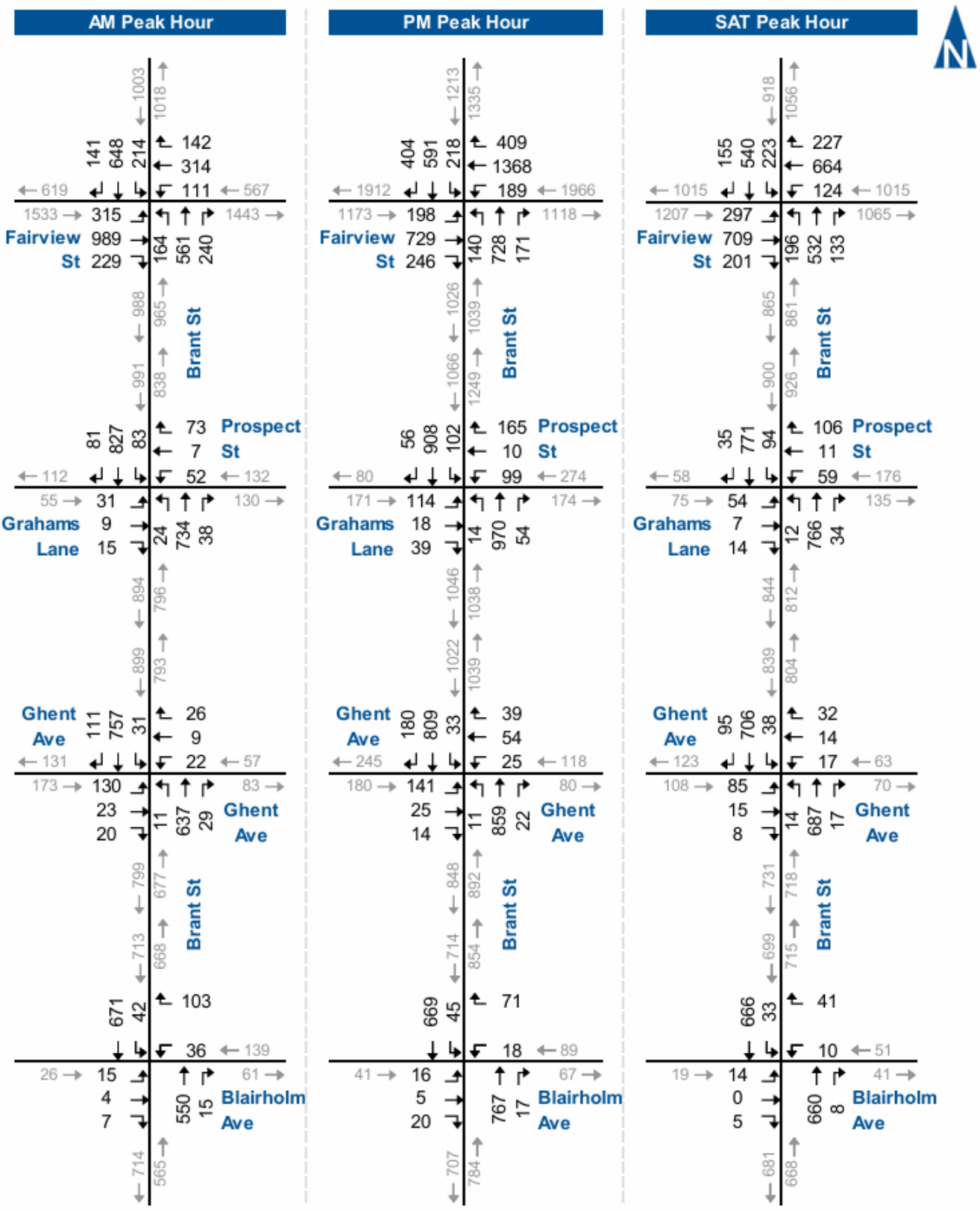


PM Peak Hour: 16:30 to 17:30



Total 8-Hour Count





Base Year Traffic Volumes

Figure 2.6

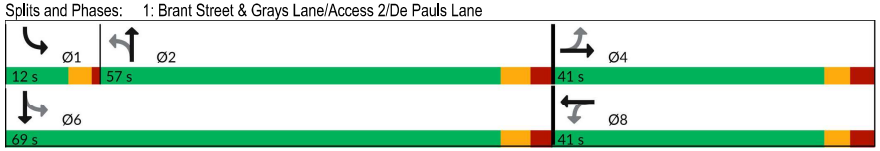
APPENDIX B

Capacity Analysis Results

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	1	8	0	7	875	54	746
Future Volume (vph)	4	1	8	0	7	875	54	746
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	38.4	38.4	38.4	38.4	31.3	31.3	11.0	31.3
Total Split (s)	41.0	41.0	41.0	41.0	57.0	57.0	12.0	69.0
Total Split (%)	37.3%	37.3%	37.3%	37.3%	51.8%	51.8%	10.9%	62.7%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.0	3.7
All-Red Time (s)	3.1	3.1	3.1	3.1	2.6	2.6	1.0	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.3	6.3	4.0	6.3
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	8.0	8.0	8.0	8.0	61.1	61.1	70.9	71.2
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.73	0.73	0.85	0.85
v/c Ratio	0.03	0.08	0.06	0.13	0.02	0.30	0.12	0.21
Control Delay (s/veh)	34.8	21.5	35.4	0.8	6.4	6.0	2.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (s/veh)	34.8	21.5	35.4	0.8	6.4	6.1	2.4	2.3
LOS	C	C	D	A	A	A	A	A
Approach Delay (s/veh)		25.0		6.8		6.1		2.3
Approach LOS		C		A		A		A

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 83.6			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.30			
Intersection Signal Delay (s/veh): 4.5		Intersection LOS: A	
Intersection Capacity Utilization 51.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Brant Street & Grays Lane/Access 2/De Pauls Lane



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1	9	8	0	38	7	875	22	54	746	22
Future Volume (vph)	4	1	9	8	0	38	7	875	22	54	746	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	0.85		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	1265		1815	1633		1601	4608		1737	4932	
Flt Permitted	0.83	1.00		0.83	1.00		0.32	1.00		0.25	1.00	
Satd. Flow (perm)	1601	1265		1592	1633		533	4608		461	4932	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	4	1	10	9	0	43	8	983	25	61	838	25
RTOR Reduction (vph)	0	9	0	0	41	0	0	1	0	0	1	0
Lane Group Flow (vph)	4	2	0	9	2	0	8	1007	0	61	862	0
Confl. Peds. (#/hr)			7	7					6	6		
Heavy Vehicles (%)	0%	100%	22%	0%	0%	0%	14%	13%	25%	5%	6%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	4.8	4.8		4.8	4.8		59.9	59.9		69.5	69.5	
Effective Green, g (s)	4.8	4.8		4.8	4.8		59.9	59.9		69.5	69.5	
Actuated g/C Ratio	0.06	0.06		0.06	0.06		0.69	0.69		0.80	0.80	
Clearance Time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	88	69		87	90		366	3172		450	3939	
v/s Ratio Prot		0.00			0.00			c0.22		0.01	c0.17	
v/s Ratio Perm	0.00			c0.01			0.02			0.10		
v/c Ratio	0.05	0.02		0.10	0.03		0.02	0.32		0.14	0.22	
Uniform Delay, d1	38.9	38.9		39.1	38.9		4.3	5.4		2.0	2.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.5	0.1		0.1	0.3		0.1	0.1	
Delay (s)	39.1	39.0		39.6	39.0		4.4	5.7		2.1	2.3	
Level of Service	D	D		D	D		A	A		A	A	
Approach Delay (s/veh)		39.0			39.1			5.7			2.3	
Approach LOS		D			D			A			A	

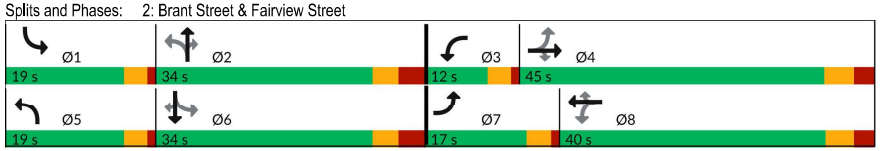
Intersection Summary				
HCM 2000 Control Delay (s/veh)	5.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	16.7	
Intersection Capacity Utilization	51.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	238	628	168	139	323	179	114	433	171	185	550	55
Future Volume (vph)	238	628	168	139	323	179	114	433	171	185	550	55
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.0	30.4	30.4	11.0	30.4	30.4	11.0	30.5	30.5	11.0	30.5	30.5
Total Split (s)	17.0	45.0	45.0	12.0	40.0	40.0	19.0	34.0	34.0	19.0	34.0	34.0
Total Split (%)	15.5%	40.9%	40.9%	10.9%	36.4%	36.4%	17.3%	30.9%	30.9%	17.3%	30.9%	30.9%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.6	2.6	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	40.0	25.9	25.9	31.8	21.5	21.5	39.8	27.7	27.7	43.9	29.8	29.8
Actuated g/C Ratio	0.42	0.27	0.27	0.34	0.23	0.23	0.42	0.29	0.29	0.47	0.32	0.32
v/c Ratio	0.58	0.72	0.33	0.58	0.45	0.39	0.33	0.46	0.32	0.45	0.55	0.10
Control Delay (s/veh)	23.8	35.3	5.7	27.4	33.3	6.9	17.4	30.5	6.2	18.6	30.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay (s/veh)	23.8	35.3	5.7	27.4	33.3	6.9	17.4	30.5	6.2	18.6	30.7	0.4
LOS	C	D	A	C	C	A	B	C	A	B	C	A
Approach Delay (s/veh)		27.9			24.6			22.6			25.8	
Approach LOS		C			C			C			C	

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 94.3			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay (s/veh): 25.5		Intersection LOS: C	
Intersection Capacity Utilization 73.6%		ICU Level of Service D	
Analysis Period (min) 15			

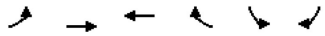
Splits and Phases: 2: Brant Street & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	238	628	168	139	323	179	114	433	171	185	550	55
Future Volume (vph)	238	628	168	139	323	179	114	433	171	185	550	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1754	3510	1530	1688	3444	1520	1772	3510	1559	1754	3476	1478
Flt Permitted	0.41	1.00	1.00	0.28	1.00	1.00	0.34	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)	758	3510	1530	490	3444	1520	642	3510	1559	697	3476	1478
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	262	690	185	153	355	197	125	476	188	203	604	60
RTOR Reduction (vph)	0	0	134	0	0	152	0	0	133	0	0	41
Lane Group Flow (vph)	262	690	51	153	355	45	125	476	55	203	604	19
Confl. Peds. (#/hr)	1		12	12		1	1		4	4		1
Heavy Vehicles (%)	4%	4%	4%	8%	6%	6%	3%	4%	3%	4%	5%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	37.9	26.0	26.0	29.5	21.6	21.6	37.2	27.7	27.7	41.4	29.8	29.8
Effective Green, g (s)	37.9	26.0	26.0	29.5	21.6	21.6	37.2	27.7	27.7	41.4	29.8	29.8
Actuated g/C Ratio	0.40	0.28	0.28	0.31	0.23	0.23	0.40	0.29	0.29	0.44	0.32	0.32
Clearance Time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	436	969	422	254	790	348	367	1033	458	436	1100	468
v/s Ratio Prot	c0.08	c0.20		0.05	0.10		0.03	0.14		c0.06	c0.17	
v/s Ratio Perm	0.16		0.03	0.14		0.03	0.10		0.04	0.15		0.01
v/c Ratio	0.60	0.71	0.12	0.60	0.45	0.13	0.34	0.46	0.12	0.47	0.55	0.04
Uniform Delay, d1	20.0	30.7	25.5	24.7	31.1	28.8	18.7	27.1	24.3	17.0	26.6	22.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	2.5	0.1	4.0	0.4	0.2	0.6	1.5	0.5	0.8	2.0	0.2
Delay (s)	22.3	33.2	25.6	28.6	31.5	29.0	19.2	28.6	24.8	17.8	28.6	22.4
Level of Service	C	C	C	C	C	C	B	C	C	B	C	C
Approach Delay (s/veh)		29.4			30.2			26.2			25.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay (s/veh)	27.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	1026	480	11	0	4
Future Volume (Veh/h)	19	1026	480	11	0	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.90	0.91
Hourly flow rate (vph)	21	1127	527	12	0	4
Pedestrians		2			1	
Lane Width (m)		3.7			3.7	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			74			
pX, platoon unblocked	0.92				0.92	0.92
vC, conflicting volume	540				1134	267
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	317				964	18
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	100
cM capacity (veh/h)	1149				231	971

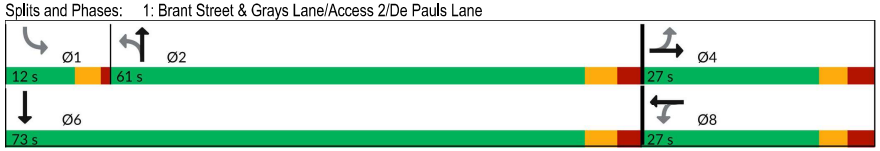
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	21	564	564	264	264	12	4
Volume Left	21	0	0	0	0	0	0
Volume Right	0	0	0	0	0	12	4
cSH	1149	1700	1700	1700	1700	1700	971
Volume to Capacity	0.02	0.33	0.33	0.16	0.16	0.01	0.00
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.0	0.0	0.1
Control Delay (s/veh)	8.2	0.0	0.0	0.0	0.0	0.0	8.7
Lane LOS	A						A
Approach Delay (s/veh)	0.1			0.0			8.7
Approach LOS							A

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	39.0%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	48	9	20	5	16	1068	129	847
Future Volume (vph)	48	9	20	5	16	1068	129	847
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		1	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	14.4	14.4	14.4	14.4	31.3	31.3	11.0	31.3
Total Split (s)	27.0	27.0	27.0	27.0	61.0	61.0	12.0	73.0
Total Split (%)	27.0%	27.0%	27.0%	27.0%	61.0%	61.0%	12.0%	73.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.0	3.7
All-Red Time (s)	3.1	3.1	3.1	3.1	2.6	2.6	1.0	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.3	6.3	4.0	6.3
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	9.6	9.6	9.6	9.6	57.7	57.7	8.0	71.0
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.65	0.65	0.09	0.80
v/c Ratio	0.37	0.19	0.13	0.35	0.04	0.36	1.51	0.22
Control Delay (s/veh)	45.0	20.1	37.8	13.8	7.9	8.4	316.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay (s/veh)	45.0	20.1	37.8	13.8	7.9	8.6	316.0	3.2
LOS	D	C	D	B	A	A	F	A
Approach Delay (s/veh)		34.5		18.3		8.6		43.2
Approach LOS		C		B		A		D

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 89.1			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.51			
Intersection Signal Delay (s/veh): 25.1		Intersection LOS: C	
Intersection Capacity Utilization 59.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Brant Street & Grays Lane/Access 2/De Pauls Lane



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	9	26	20	5	81	16	1068	25	129	847	30
Future Volume (vph)	48	9	26	20	5	81	16	1068	25	129	847	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.86		1.00	1.00		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)	1659	1539		1800	1650		1722	4742		1821	5117	
Flt Permitted	0.70	1.00		0.73	1.00		0.31	1.00		0.50	1.00	
Satd. Flow (perm)	1223	1539		1391	1650		560	4742		959	5117	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	48	9	26	20	5	82	16	1079	25	130	856	30
RTOR Reduction (vph)	0	24	0	0	75	0	0	2	0	0	3	0
Lane Group Flow (vph)	48	11	0	20	12	0	16	1102	0	130	883	0
Confl. Peds. (#/hr)			17	17					6	6		
Heavy Vehicles (%)	10%	11%	8%	0%	0%	0%	6%	10%	16%	0%	2%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			1		
Actuated Green, G (s)	7.9	7.9		7.9	7.9		57.8	57.8		8.0	69.8	
Effective Green, g (s)	7.9	7.9		7.9	7.9		57.8	57.8		8.0	69.8	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.64	0.64		0.09	0.77	
Clearance Time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	106	134		121	144		358	3031		84	3950	
v/s Ratio Prot		0.01			0.01			c0.23			0.17	
v/s Ratio Perm	c0.04			0.01			0.03			c0.14		
v/c Ratio	0.45	0.08		0.17	0.08		0.04	0.36		1.55	0.22	
Uniform Delay, d1	39.2	37.9		38.2	37.9		6.1	7.7		41.2	2.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.3		0.6	0.3		0.2	0.3		296.7	0.1	
Delay (s)	42.3	38.2		38.8	38.2		6.3	8.0		337.9	3.0	
Level of Service	D	D		D	D		A	A		F	A	
Approach Delay (s/veh)		40.5			38.3			8.0			45.8	
Approach LOS		D			D			A			D	

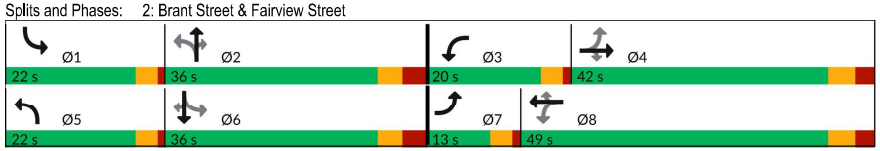
Intersection Summary				
HCM 2000 Control Delay (s/veh)	27.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	16.7	
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	734	177	188	1273	304	227	627	180	224	466	153
Future Volume (vph)	176	734	177	188	1273	304	227	627	180	224	466	153
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.0	30.4	30.4	11.0	30.4	30.4	11.0	30.5	30.5	11.0	30.5	30.5
Total Split (s)	13.0	42.0	42.0	20.0	49.0	49.0	22.0	36.0	36.0	22.0	36.0	36.0
Total Split (%)	10.8%	35.0%	35.0%	16.7%	40.8%	40.8%	18.3%	30.0%	30.0%	18.3%	30.0%	30.0%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	50.1	38.7	38.7	56.8	42.6	42.6	47.6	29.7	29.7	47.1	29.5	29.5
Actuated g/C Ratio	0.43	0.33	0.33	0.48	0.36	0.36	0.41	0.25	0.25	0.40	0.25	0.25
v/c Ratio	0.92	0.68	0.30	0.65	1.07	0.44	0.62	0.75	0.37	0.73	0.56	0.32
Control Delay (s/veh)	73.8	38.4	5.7	27.5	81.2	6.5	29.0	46.6	7.4	36.0	41.4	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.0
Total Delay (s/veh)	73.8	38.4	5.7	27.5	81.2	6.5	29.0	46.6	7.4	36.6	42.1	7.2
LOS	E	D	A	C	F	A	C	D	A	D	D	A
Approach Delay (s/veh)		38.8			62.6			35.9			34.3	
Approach LOS		D			E			D			C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 117.4			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay (s/veh): 46.3		Intersection LOS: D	
Intersection Capacity Utilization 94.9%		ICU Level of Service F	
Analysis Period (min) 15			

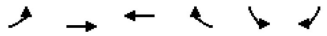
Splits and Phases: 2: Brant Street & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	734	177	188	1273	304	227	627	180	224	466	153
Future Volume (vph)	176	734	177	188	1273	304	227	627	180	224	466	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1807	3579	1579	1771	3579	1553	1772	3614	1531	1805	3614	1579
Flt Permitted	0.10	1.00	1.00	0.17	1.00	1.00	0.32	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	197	3579	1579	324	3579	1553	603	3614	1531	366	3614	1579
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)	191	798	192	204	1384	330	247	682	196	243	507	166
RTOR Reduction (vph)	0	0	129	0	0	190	0	0	144	0	0	124
Lane Group Flow (vph)	191	798	63	204	1384	140	247	682	52	243	507	42
Confl. Peds. (#/hr)	6		8	8		6	1		22	22		1
Heavy Vehicles (%)	1%	2%	1%	3%	2%	3%	3%	1%	2%	1%	1%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	47.7	38.7	38.7	55.5	42.6	42.6	45.2	29.8	29.8	44.6	29.5	29.5
Effective Green, g (s)	47.7	38.7	38.7	55.5	42.6	42.6	45.2	29.8	29.8	44.6	29.5	29.5
Actuated g/C Ratio	0.41	0.33	0.33	0.47	0.36	0.36	0.39	0.25	0.25	0.38	0.25	0.25
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	203	1179	520	312	1298	563	385	917	388	324	908	396
v/s Ratio Prot	c0.07	0.22		c0.07	c0.39		0.08	c0.19		c0.10	0.14	
v/s Ratio Perm	0.31		0.04	0.24		0.09	0.16		0.03	0.19		0.03
v/c Ratio	0.94	0.68	0.12	0.65	1.07	0.25	0.64	0.74	0.13	0.75	0.56	0.11
Uniform Delay, d1	28.8	34.0	27.5	21.3	37.4	26.2	26.3	40.3	33.8	27.5	38.3	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	46.5	1.6	0.1	4.9	44.7	0.2	3.6	5.4	0.7	9.4	2.5	0.5
Delay (s)	75.3	35.5	27.6	26.2	82.1	26.4	29.9	45.7	34.5	36.9	40.8	34.3
Level of Service	E	D	C	C	F	C	C	D	C	D	D	C
Approach Delay (s/veh)		40.7			66.6			40.3			38.6	
Approach LOS		D			E			D			D	

Intersection Summary					
HCM 2000 Control Delay (s/veh)	49.9	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.91				
Actuated Cycle Length (s)	117.4	Sum of lost time (s)	20.9		
Intersection Capacity Utilization	94.9%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	1110	1509	22	0	33
Future Volume (Veh/h)	35	1110	1509	22	0	33
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	37	1181	1605	23	0	35
Pedestrians					3	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			74			
pX, platoon unblocked	0.64				0.64	0.64
vC, conflicting volume	1631				2273	806
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	868				1867	0
tC, single (s)	4.1				6.8	8.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.3
p0 queue free %	93				100	93
cM capacity (veh/h)	502				39	536

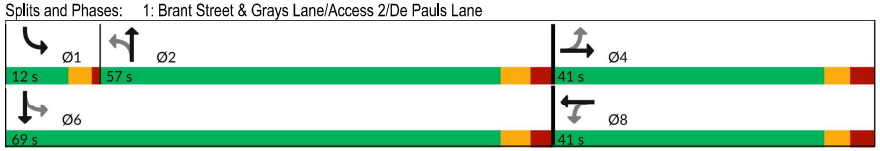
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	37	591	591	803	803	23	35
Volume Left	37	0	0	0	0	0	0
Volume Right	0	0	0	0	0	23	35
cSH	502	1700	1700	1700	1700	1700	536
Volume to Capacity	0.07	0.35	0.35	0.47	0.47	0.01	0.07
Queue Length 95th (m)	1.8	0.0	0.0	0.0	0.0	0.0	1.6
Control Delay (s/veh)	12.7	0.0	0.0	0.0	0.0	0.0	12.2
Lane LOS	B						B
Approach Delay (s/veh)	0.4			0.0			12.2
Approach LOS							B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	72	9	13	2	22	780	132	771
Future Volume (vph)	72	9	13	2	22	780	132	771
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	38.4	38.4	38.4	38.4	31.3	31.3	11.0	31.3
Total Split (s)	41.0	41.0	41.0	41.0	57.0	57.0	12.0	69.0
Total Split (%)	37.3%	37.3%	37.3%	37.3%	51.8%	51.8%	10.9%	62.7%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.0	3.7
All-Red Time (s)	3.1	3.1	3.1	3.1	2.6	2.6	1.0	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.3	6.3	4.0	6.3
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.7	10.7	10.7	10.7	54.3	54.3	68.1	67.1
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.63	0.63	0.79	0.78
v/c Ratio	0.47	0.21	0.09	0.21	0.08	0.31	0.29	0.23
Control Delay (s/veh)	44.4	20.4	33.9	12.9	9.2	8.7	4.5	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay (s/veh)	44.4	20.4	33.9	12.9	9.2	8.8	4.5	3.8
LOS	D	C	C	B	A	A	A	A
Approach Delay (s/veh)		37.3		17.5		8.9		3.9
Approach LOS		D		B		A		A

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 86.2			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay (s/veh): 8.3		Intersection LOS: A	
Intersection Capacity Utilization 56.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Brant Street & Grays Lane/Access 2/De Pauls Lane



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	9	21	13	2	45	22	780	20	132	771	11
Future Volume (vph)	72	9	21	13	2	45	22	780	20	132	771	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.86		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	1170		1815	1644		1601	4609		1737	4940	
Flt Permitted	0.72	1.00		0.73	1.00		0.31	1.00		0.28	1.00	
Satd. Flow (perm)	1388	1170		1404	1644		525	4609		509	4940	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	81	10	24	15	2	51	25	876	22	148	866	12
RTOR Reduction (vph)	0	22	0	0	46	0	0	2	0	0	1	0
Lane Group Flow (vph)	81	12	0	15	7	0	25	896	0	148	877	0
Confl. Peds. (#/hr)			7	7					6	6		
Heavy Vehicles (%)	0%	100%	22%	0%	0%	0%	14%	13%	25%	5%	6%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.0	9.0		9.0	9.0		54.3	54.3		65.8	65.8	
Effective Green, g (s)	9.0	9.0		9.0	9.0		54.3	54.3		65.8	65.8	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.62	0.62		0.75	0.75	
Clearance Time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	120		144	169		325	2860		488	3714	
v/s Ratio Prot		0.01			0.00			0.19		c0.03	0.18	
v/s Ratio Perm	c0.06			0.01			0.05			c0.20		
v/c Ratio	0.57	0.10		0.10	0.04		0.08	0.31		0.30	0.24	
Uniform Delay, d1	37.4	35.6		35.6	35.4		6.6	7.8		3.1	3.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	0.4		0.3	0.1		0.5	0.3		0.4	0.1	
Delay (s)	42.8	36.0		35.9	35.5		7.1	8.1		3.5	3.4	
Level of Service	D	D		D	D		A	A		A	A	
Approach Delay (s/veh)		40.8			35.6			8.1			3.4	
Approach LOS		D			D			A			A	

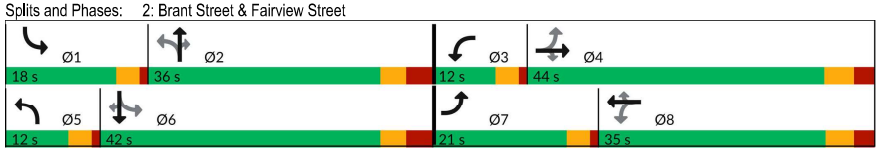
Intersection Summary				
HCM 2000 Control Delay (s/veh)	8.5	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	16.7	
Intersection Capacity Utilization	56.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	712	145	124	624	170	318	458	140	228	424	58
Future Volume (vph)	264	712	145	124	624	170	318	458	140	228	424	58
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.0	30.4	30.4	11.0	30.4	30.4	11.0	30.5	30.5	11.0	30.5	30.5
Total Split (s)	21.0	44.0	44.0	12.0	35.0	35.0	12.0	36.0	36.0	18.0	42.0	42.0
Total Split (%)	19.1%	40.0%	40.0%	10.9%	31.8%	31.8%	10.9%	32.7%	32.7%	16.4%	38.2%	38.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.6	2.6	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	48.3	34.1	34.1	36.2	26.0	26.0	41.4	30.9	30.9	49.6	35.6	35.6
Actuated g/C Ratio	0.45	0.32	0.32	0.34	0.24	0.24	0.39	0.29	0.29	0.47	0.33	0.33
v/c Ratio	0.83	0.70	0.27	0.55	0.81	0.36	0.84	0.50	0.26	0.60	0.40	0.11
Control Delay (s/veh)	42.3	35.3	5.3	27.3	46.7	6.4	45.3	34.5	3.2	25.0	29.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0
Total Delay (s/veh)	42.3	35.3	5.3	27.3	46.7	6.4	45.3	34.5	3.2	26.5	29.2	0.4
LOS	D	D	A	C	D	A	D	C	A	C	C	A
Approach Delay (s/veh)		33.0			36.6			33.4			26.0	
Approach LOS		C			D			C			C	

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 106.5			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay (s/veh): 32.7		Intersection LOS: C	
Intersection Capacity Utilization 86.9%		ICU Level of Service E	
Analysis Period (min) 15			

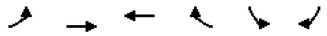
Splits and Phases: 2: Brant Street & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	712	145	124	624	170	318	458	140	228	424	58
Future Volume (vph)	264	712	145	124	624	170	318	458	140	228	424	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1755	3510	1527	1688	3444	1520	1771	3510	1558	1754	3476	1478
Flt Permitted	0.16	1.00	1.00	0.26	1.00	1.00	0.48	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	290	3510	1527	466	3444	1520	903	3510	1558	601	3476	1478
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	290	782	159	136	686	187	349	503	154	251	466	64
RTOR Reduction (vph)	0	0	108	0	0	141	0	0	109	0	0	43
Lane Group Flow (vph)	290	782	51	136	686	46	349	503	45	251	466	21
Confl. Peds. (#/hr)	1		12	12		1	1		4	4		1
Heavy Vehicles (%)	4%	4%	4%	8%	6%	6%	3%	4%	3%	4%	5%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	45.9	34.1	34.1	33.8	26.0	26.0	38.8	30.8	30.8	47.6	35.6	35.6
Effective Green, g (s)	45.9	34.1	34.1	33.8	26.0	26.0	38.8	30.8	30.8	47.6	35.6	35.6
Actuated g/C Ratio	0.43	0.32	0.32	0.32	0.24	0.24	0.36	0.29	0.29	0.45	0.33	0.33
Clearance Time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	345	1124	489	237	841	371	394	1016	451	407	1163	494
v/s Ratio Prot	c0.13	0.22		0.04	0.20		c0.07	0.14		c0.07	0.13	
v/s Ratio Perm	c0.24		0.03	0.14		0.03	c0.26		0.03	0.20		0.01
v/c Ratio	0.84	0.70	0.10	0.57	0.82	0.12	0.89	0.50	0.10	0.62	0.40	0.04
Uniform Delay, d1	23.1	31.6	25.4	27.2	37.9	31.3	29.0	31.4	27.6	19.7	27.2	23.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.6	1.9	0.1	3.3	6.1	0.1	20.5	1.7	0.4	2.8	1.0	0.2
Delay (s)	39.7	33.5	25.5	30.6	44.1	31.5	49.4	33.1	28.1	22.5	28.2	24.1
Level of Service	D	C	C	C	D	C	D	C	C	C	C	C
Approach Delay (s/veh)		33.9			39.9			38.0			26.0	
Approach LOS		C			D			D			C	

Intersection Summary					
HCM 2000 Control Delay (s/veh)	34.9	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.87				
Actuated Cycle Length (s)	106.4	Sum of lost time (s)	20.9		
Intersection Capacity Utilization	86.9%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	53	1077	739	12	0	18
Future Volume (Veh/h)	53	1077	739	12	0	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.90	0.91
Hourly flow rate (vph)	58	1184	812	13	0	20
Pedestrians		2			1	
Lane Width (m)		3.7			3.7	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			74			
pX, platoon unblocked	0.83				0.83	0.83
vC, conflicting volume	826				1521	409
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	383				1220	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				100	98
cM capacity (veh/h)	985				137	904

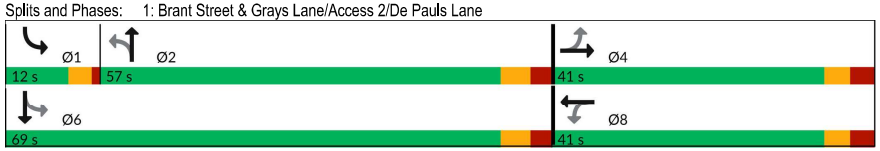
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	58	592	592	406	406	13	20
Volume Left	58	0	0	0	0	0	0
Volume Right	0	0	0	0	0	13	20
cSH	985	1700	1700	1700	1700	1700	904
Volume to Capacity	0.06	0.35	0.35	0.24	0.24	0.01	0.02
Queue Length 95th (m)	1.4	0.0	0.0	0.0	0.0	0.0	0.5
Control Delay (s/veh)	8.9	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS	A						A
Approach Delay (s/veh)	0.4			0.0			9.1
Approach LOS							A

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	40.4%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	73	10	9	9	76	1005	62	857
Future Volume (vph)	73	10	9	9	76	1005	62	857
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	38.4	38.4	38.4	38.4	31.3	31.3	11.0	31.3
Total Split (s)	41.0	41.0	41.0	41.0	57.0	57.0	12.0	69.0
Total Split (%)	37.3%	37.3%	37.3%	37.3%	51.8%	51.8%	10.9%	62.7%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.0	3.7
All-Red Time (s)	3.1	3.1	3.1	3.1	2.6	2.6	1.0	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.3	6.3	4.0	6.3
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.9	10.9	10.9	10.9	56.5	56.5	67.9	65.6
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.63	0.63	0.76	0.74
v/c Ratio	0.49	0.41	0.06	0.24	0.29	0.40	0.18	0.28
Control Delay (s/veh)	45.4	16.2	33.4	15.4	12.6	9.3	4.2	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay (s/veh)	45.4	16.2	33.4	15.4	12.6	9.5	4.2	4.3
LOS	D	B	C	B	B	A	A	A
Approach Delay (s/veh)		30.1		18.0		9.7		4.3
Approach LOS		C		B		A		A

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 89.2			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay (s/veh): 9.0		Intersection LOS: A	
Intersection Capacity Utilization 54.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Brant Street & Grays Lane/Access 2/De Pauls Lane



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	10	70	9	9	44	76	1005	25	62	857	34
Future Volume (vph)	73	10	70	9	9	44	76	1005	25	62	857	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.87		1.00	0.88		1.00	1.00		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)	1825	1248		1816	1682		1601	4609		1738	4927	
Flt Permitted	0.72	1.00		0.70	1.00		0.27	1.00		0.20	1.00	
Satd. Flow (perm)	1380	1248		1335	1682		462	4609		369	4927	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	82	11	79	10	10	49	85	1129	28	70	963	38
RTOR Reduction (vph)	0	69	0	0	43	0	0	1	0	0	2	0
Lane Group Flow (vph)	82	21	0	10	16	0	85	1156	0	70	999	0
Confl. Peds. (#/hr)			7	7					6	6		
Heavy Vehicles (%)	0%	100%	22%	0%	0%	0%	14%	13%	25%	5%	6%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	10.9	10.9		10.9	10.9		56.5	56.5		66.4	66.4	
Effective Green, g (s)	10.9	10.9		10.9	10.9		56.5	56.5		66.4	66.4	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.63	0.63		0.74	0.74	
Clearance Time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	167	151		161	203		290	2893		361	3635	
v/s Ratio Prot		0.02			0.01			c0.25		0.01	c0.20	
v/s Ratio Perm	c0.06			0.01			0.18			0.13		
v/c Ratio	0.49	0.14		0.06	0.08		0.29	0.40		0.19	0.27	
Uniform Delay, d1	37.0	35.3		35.0	35.1		7.6	8.3		3.7	3.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.4		0.2	0.2		2.6	0.4		0.3	0.2	
Delay (s)	39.2	35.8		35.2	35.3		10.2	8.7		3.9	4.1	
Level of Service	D	D		D	D		B	A		A	A	
Approach Delay (s/veh)		37.4			35.2			8.8			4.1	
Approach LOS		D			D			A			A	

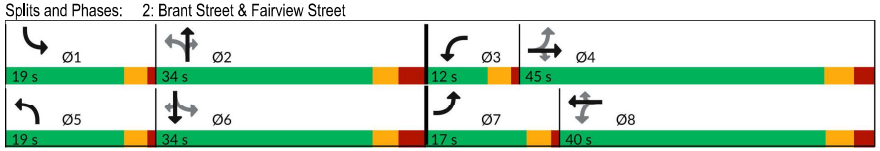
Intersection Summary				
HCM 2000 Control Delay (s/veh)	9.5	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.7	
Intersection Capacity Utilization	54.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	721	193	160	393	223	139	532	196	230	666	71
Future Volume (vph)	290	721	193	160	393	223	139	532	196	230	666	71
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.0	30.4	30.4	11.0	30.4	30.4	11.0	30.5	30.5	11.0	30.5	30.5
Total Split (s)	17.0	45.0	45.0	12.0	40.0	40.0	19.0	34.0	34.0	19.0	34.0	34.0
Total Split (%)	15.5%	40.9%	40.9%	10.9%	36.4%	36.4%	17.3%	30.9%	30.9%	17.3%	30.9%	30.9%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.6	2.6	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	44.5	30.0	30.0	35.7	25.4	25.4	40.9	27.7	27.7	45.6	30.1	30.1
Actuated g/C Ratio	0.45	0.30	0.30	0.36	0.25	0.25	0.41	0.28	0.28	0.46	0.30	0.30
v/c Ratio	0.74	0.75	0.35	0.73	0.49	0.43	0.48	0.60	0.37	0.64	0.70	0.14
Control Delay (s/veh)	30.5	36.4	5.2	37.8	33.7	6.3	21.9	35.8	6.5	25.7	36.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
Total Delay (s/veh)	30.5	36.4	5.2	37.8	33.7	6.3	21.9	35.8	6.5	25.7	38.1	0.5
LOS	C	D	A	D	C	A	C	D	A	C	D	A
Approach Delay (s/veh)		30.0			26.7			26.9			32.4	
Approach LOS		C			C			C			C	

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 99.9			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay (s/veh): 29.2		Intersection LOS: C	
Intersection Capacity Utilization 79.0%		ICU Level of Service D	
Analysis Period (min) 15			

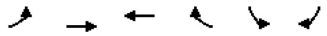
Splits and Phases: 2: Brant Street & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	721	193	160	393	223	139	532	196	230	666	71
Future Volume (vph)	290	721	193	160	393	223	139	532	196	230	666	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1755	3510	1528	1689	3444	1520	1772	3510	1559	1754	3476	1478
Flt Permitted	0.36	1.00	1.00	0.21	1.00	1.00	0.24	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	658	3510	1528	382	3444	1520	441	3510	1559	514	3476	1478
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	319	792	212	176	432	245	153	585	215	253	732	78
RTOR Reduction (vph)	0	0	148	0	0	183	0	0	155	0	0	55
Lane Group Flow (vph)	319	792	64	176	432	62	153	585	60	253	732	23
Confl. Peds. (#/hr)	1		12	12		1	1		4	4		1
Heavy Vehicles (%)	4%	4%	4%	8%	6%	6%	3%	4%	3%	4%	5%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	42.1	30.0	30.0	33.5	25.4	25.4	38.4	27.7	27.7	43.0	30.0	30.0
Effective Green, g (s)	42.1	30.0	30.0	33.5	25.4	25.4	38.4	27.7	27.7	43.0	30.0	30.0
Actuated g/C Ratio	0.42	0.30	0.30	0.34	0.25	0.25	0.39	0.28	0.28	0.43	0.30	0.30
Clearance Time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	418	1056	459	234	877	387	312	975	433	383	1045	444
v/s Ratio Prot	c0.10	0.23		0.06	0.13		0.05	0.17		c0.09	c0.21	
v/s Ratio Perm	c0.22		0.04	0.19		0.04	0.14		0.04	0.20		0.02
v/c Ratio	0.76	0.75	0.14	0.75	0.49	0.16	0.49	0.60	0.14	0.66	0.70	0.05
Uniform Delay, d1	20.9	31.5	25.4	25.2	31.7	28.9	21.3	31.2	27.0	19.7	30.9	24.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	3.0	0.1	12.8	0.4	0.2	1.2	2.7	0.7	4.2	3.9	0.2
Delay (s)	28.9	34.5	25.6	38.0	32.1	29.1	22.5	33.9	27.7	23.9	34.8	25.0
Level of Service	C	C	C	D	C	C	C	C	C	C	C	C
Approach Delay (s/veh)		31.7			32.4			30.7			31.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay (s/veh)	31.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	99.7	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	79.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	1196	555	47	0	39
Future Volume (Veh/h)	73	1196	555	47	0	39
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.90	0.91
Hourly flow rate (vph)	80	1314	610	52	0	43
Pedestrians		2			1	
Lane Width (m)		3.7			3.7	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			74			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	663				1428	308
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	405				1254	10
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				100	96
cM capacity (veh/h)	1048				138	965

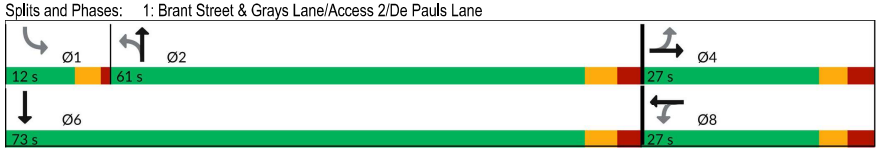
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	80	657	657	305	305	52	43
Volume Left	80	0	0	0	0	0	0
Volume Right	0	0	0	0	0	52	43
cSH	1048	1700	1700	1700	1700	1700	965
Volume to Capacity	0.08	0.39	0.39	0.18	0.18	0.03	0.04
Queue Length 95th (m)	1.9	0.0	0.0	0.0	0.0	0.0	1.1
Control Delay (s/veh)	8.7	0.0	0.0	0.0	0.0	0.0	8.9
Lane LOS	A						A
Approach Delay (s/veh)	0.5			0.0			8.9
Approach LOS							A

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	43.7%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	115	19	23	23	78	1227	148	973
Future Volume (vph)	115	19	23	23	78	1227	148	973
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		1	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	14.4	14.4	14.4	14.4	31.3	31.3	11.0	31.3
Total Split (s)	27.0	27.0	27.0	27.0	61.0	61.0	12.0	73.0
Total Split (%)	27.0%	27.0%	27.0%	27.0%	61.0%	61.0%	12.0%	73.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.0	3.7
All-Red Time (s)	3.1	3.1	3.1	3.1	2.6	2.6	1.0	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.3	6.3	4.0	6.3
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	14.2	14.2	14.2	14.2	54.8	54.8	8.0	66.8
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.58	0.58	0.09	0.71
v/c Ratio	0.64	0.34	0.12	0.35	0.28	0.46	1.84	0.28
Control Delay (s/veh)	54.0	14.3	34.7	13.8	14.3	12.2	445.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Total Delay (s/veh)	54.0	14.3	34.7	13.8	14.3	12.7	445.4	5.4
LOS	D	B	C	B	B	B	F	A
Approach Delay (s/veh)		35.5		17.2		12.8		61.2
Approach LOS		D		B		B		E

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 93.7			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.84			
Intersection Signal Delay (s/veh): 34.5		Intersection LOS: C	
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Brant Street & Grays Lane/Access 2/De Pauls Lane



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	19	81	23	23	93	78	1227	29	148	973	43
Future Volume (vph)	115	19	81	23	23	93	78	1227	29	148	973	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.88		1.00	1.00		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)	1659	1520		1801	1690		1722	4742		1822	5112	
Flt Permitted	0.68	1.00		0.69	1.00		0.27	1.00		0.50	1.00	
Satd. Flow (perm)	1191	1520		1312	1690		484	4742		959	5112	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	116	19	82	23	23	94	79	1239	29	149	983	43
RTOR Reduction (vph)	0	70	0	0	80	0	0	2	0	0	4	0
Lane Group Flow (vph)	116	31	0	23	37	0	79	1266	0	149	1022	0
Confl. Peds. (#/hr)			17	17					6	6		
Heavy Vehicles (%)	10%	11%	8%	0%	0%	0%	6%	10%	16%	0%	2%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			1		
Actuated Green, G (s)	14.2	14.2		14.2	14.2		54.8	54.8		8.0	66.8	
Effective Green, g (s)	14.2	14.2		14.2	14.2		54.8	54.8		8.0	66.8	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.58	0.58		0.09	0.71	
Clearance Time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	180	230		198	256		283	2773		81	3644	
v/s Ratio Prot		0.02			0.02			c0.27			0.20	
v/s Ratio Perm	c0.10			0.02			0.16			c0.16		
v/c Ratio	0.64	0.14		0.12	0.15		0.28	0.46		1.84	0.28	
Uniform Delay, d1	37.4	34.4		34.3	34.5		9.7	11.0		42.9	4.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	0.3		0.3	0.3		2.4	0.5		421.4	0.2	
Delay (s)	45.1	34.7		34.6	34.7		12.1	11.6		464.3	5.0	
Level of Service	D	C		C	C		B	B		F	A	
Approach Delay (s/veh)		40.2			34.7			11.6			63.3	
Approach LOS		D			C			B			E	

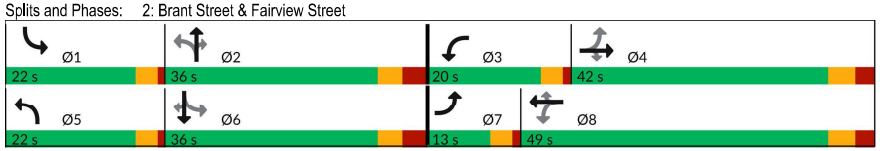
Intersection Summary					
HCM 2000 Control Delay (s/veh)	36.0	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.63				
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	16.7		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	843	203	216	1488	365	266	754	207	274	561	185
Future Volume (vph)	211	843	203	216	1488	365	266	754	207	274	561	185
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.0	30.4	30.4	11.0	30.4	30.4	11.0	30.5	30.5	11.0	30.5	30.5
Total Split (s)	13.0	42.0	42.0	20.0	49.0	49.0	22.0	36.0	36.0	22.0	36.0	36.0
Total Split (%)	10.8%	35.0%	35.0%	16.7%	40.8%	40.8%	18.3%	30.0%	30.0%	18.3%	30.0%	30.0%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	48.5	37.1	37.1	57.6	42.6	42.6	48.7	29.5	29.5	50.1	30.2	30.2
Actuated g/C Ratio	0.41	0.31	0.31	0.48	0.36	0.36	0.41	0.25	0.25	0.42	0.25	0.25
v/c Ratio	1.12	0.82	0.34	0.83	1.27	0.53	0.78	0.92	0.44	0.90	0.67	0.37
Control Delay (s/veh)	129.5	46.0	5.7	50.6	160.0	10.0	37.9	60.1	11.7	60.7	44.5	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0
Total Delay (s/veh)	129.5	46.0	5.7	50.6	160.0	10.0	37.9	60.1	11.7	60.7	45.8	7.0
LOS	F	D	A	D	F	A	D	E	B	E	D	A
Approach Delay (s/veh)		53.5			122.1			47.1			42.8	
Approach LOS		D			F			D			D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 119.4			
Natural Cycle: 115			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay (s/veh): 75.6		Intersection LOS: E	
Intersection Capacity Utilization 106.3%		ICU Level of Service G	
Analysis Period (min) 15			

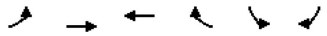
Splits and Phases: 2: Brant Street & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	843	203	216	1488	365	266	754	207	274	561	185
Future Volume (vph)	211	843	203	216	1488	365	266	754	207	274	561	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1807	3579	1578	1772	3579	1552	1772	3614	1530	1806	3614	1579
Flt Permitted	0.11	1.00	1.00	0.10	1.00	1.00	0.25	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	205	3579	1578	190	3579	1552	462	3614	1530	252	3614	1579
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)	229	916	221	235	1617	397	289	820	225	298	610	201
RTOR Reduction (vph)	0	0	152	0	0	197	0	0	139	0	0	150
Lane Group Flow (vph)	229	916	69	235	1617	200	289	820	86	298	610	51
Confl. Peds. (#/hr)	6		8	8		6	1		22	22		1
Heavy Vehicles (%)	1%	2%	1%	3%	2%	3%	3%	1%	2%	1%	1%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	46.1	37.1	37.1	55.6	42.6	42.6	46.1	29.5	29.5	47.5	30.2	30.2
Effective Green, g (s)	46.1	37.1	37.1	55.6	42.6	42.6	46.1	29.5	29.5	47.5	30.2	30.2
Actuated g/C Ratio	0.39	0.31	0.31	0.47	0.36	0.36	0.39	0.25	0.25	0.40	0.25	0.25
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	200	1113	490	280	1278	554	360	893	378	325	914	399
v/s Ratio Prot	c0.09	0.26		0.10	c0.45		0.11	0.23		c0.13	0.17	
v/s Ratio Perm	0.36		0.04	0.29		0.13	0.20		0.06	c0.23		0.03
v/c Ratio	1.15	0.82	0.14	0.84	1.27	0.36	0.80	0.92	0.23	0.92	0.67	0.13
Uniform Delay, d1	30.7	38.1	29.6	29.7	38.3	28.3	27.8	43.7	35.8	32.3	40.0	34.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	108.1	5.0	0.1	19.3	125.7	0.4	12.2	15.8	1.4	29.3	3.9	0.7
Delay (s)	138.8	43.1	29.7	49.0	164.1	28.7	40.0	59.6	37.2	61.6	43.9	35.0
Level of Service	F	D	C	D	F	C	D	E	D	E	D	D
Approach Delay (s/veh)		57.0			128.2			51.6			47.0	
Approach LOS		E			F			D			D	

Intersection Summary					
HCM 2000 Control Delay (s/veh)	80.4	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.09				
Actuated Cycle Length (s)	119.3	Sum of lost time (s)	20.9		
Intersection Capacity Utilization	106.3%	ICU Level of Service	G		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	91	1284	1738	59	0	89
Future Volume (Veh/h)	91	1284	1738	59	0	89
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	97	1366	1849	63	0	95
Pedestrians					3	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			74			
pX, platoon unblocked	0.65				0.65	0.65
vC, conflicting volume	1915				2729	928
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1321				2581	0
tC, single (s)	4.1				6.8	8.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.3
p0 queue free %	72				100	82
cM capacity (veh/h)	341				10	539

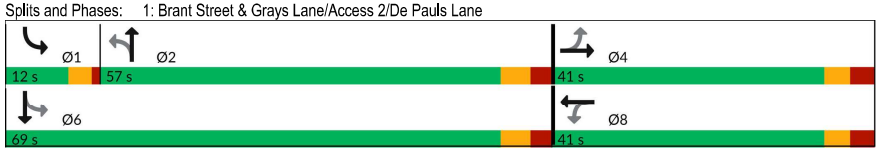
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	97	683	683	925	925	63	95
Volume Left	97	0	0	0	0	0	0
Volume Right	0	0	0	0	0	63	95
cSH	341	1700	1700	1700	1700	1700	539
Volume to Capacity	0.28	0.40	0.40	0.54	0.54	0.04	0.18
Queue Length 95th (m)	8.7	0.0	0.0	0.0	0.0	0.0	4.8
Control Delay (s/veh)	19.7	0.0	0.0	0.0	0.0	0.0	13.1
Lane LOS	C						B
Approach Delay (s/veh)	1.3			0.0			13.1
Approach LOS							B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	151	27	15	19	85	896	152	886
Future Volume (vph)	151	27	15	19	85	896	152	886
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	38.4	38.4	38.4	38.4	31.3	31.3	11.0	31.3
Total Split (s)	41.0	41.0	41.0	41.0	57.0	57.0	12.0	69.0
Total Split (%)	37.3%	37.3%	37.3%	37.3%	51.8%	51.8%	10.9%	62.7%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.0	3.7
All-Red Time (s)	3.1	3.1	3.1	3.1	2.6	2.6	1.0	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.3	6.3	4.0	6.3
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	16.8	16.8	16.8	16.8	51.2	51.2	65.2	62.9
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.55	0.55	0.70	0.68
v/c Ratio	0.69	0.42	0.07	0.22	0.38	0.40	0.43	0.30
Control Delay (s/veh)	50.0	15.3	30.7	13.9	19.4	13.1	8.8	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay (s/veh)	50.0	15.3	30.7	13.9	19.4	13.5	8.8	6.8
LOS	D	B	C	B	B	B	A	A
Approach Delay (s/veh)		35.4		16.9		14.0		7.1
Approach LOS		D		B		B		A

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 92.5			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay (s/veh): 13.4		Intersection LOS: B	
Intersection Capacity Utilization 60.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Brant Street & Grays Lane/Access 2/De Pauls Lane



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	27	84	15	19	52	85	896	23	152	886	22
Future Volume (vph)	151	27	84	15	19	52	85	896	23	152	886	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	1192		1816	1710		1601	4608		1737	4934	
Flt Permitted	0.71	1.00		0.68	1.00		0.27	1.00		0.22	1.00	
Satd. Flow (perm)	1356	1192		1295	1710		452	4608		409	4934	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	170	30	94	17	21	58	96	1007	26	171	996	25
RTOR Reduction (vph)	0	77	0	0	47	0	0	2	0	0	2	0
Lane Group Flow (vph)	170	47	0	17	32	0	96	1031	0	171	1019	0
Confl. Peds. (#/hr)			7	7					6	6		
Heavy Vehicles (%)	0%	100%	22%	0%	0%	0%	14%	13%	25%	5%	6%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.8	16.8		16.8	16.8		51.2	51.2		62.9	62.9	
Effective Green, g (s)	16.8	16.8		16.8	16.8		51.2	51.2		62.9	62.9	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.55	0.55		0.68	0.68	
Clearance Time (s)	6.4	6.4		6.4	6.4		6.3	6.3		4.0	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	246	216		235	310		250	2553		389	3358	
v/s Ratio Prot		0.04			0.02			0.22		c0.04	0.21	
v/s Ratio Perm	c0.13			0.01			0.21			c0.26		
v/c Ratio	0.69	0.22		0.07	0.10		0.38	0.40		0.44	0.30	
Uniform Delay, d1	35.4	32.2		31.3	31.5		11.7	11.8		5.9	5.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.1	0.5		0.1	0.1		4.4	0.5		0.8	0.2	
Delay (s)	43.5	32.7		31.5	31.7		16.1	12.3		6.6	6.2	
Level of Service	D	C		C	C		B	B		A	A	
Approach Delay (s/veh)		38.9			31.6			12.6			6.2	
Approach LOS		D			C			B			A	

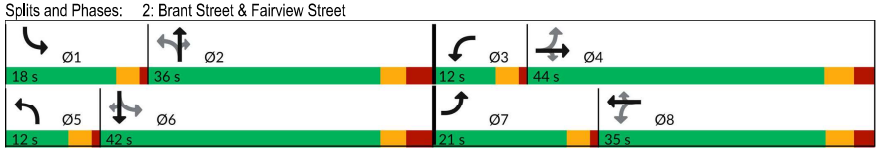
Intersection Summary					
HCM 2000 Control Delay (s/veh)	13.3	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	92.4	Sum of lost time (s)	16.7		
Intersection Capacity Utilization	60.6%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	321	818	167	142	728	204	370	560	161	279	521	76
Future Volume (vph)	321	818	167	142	728	204	370	560	161	279	521	76
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.0	30.4	30.4	11.0	30.4	30.4	11.0	30.5	30.5	11.0	30.5	30.5
Total Split (s)	21.0	44.0	44.0	12.0	35.0	35.0	12.0	36.0	36.0	18.0	42.0	42.0
Total Split (%)	19.1%	40.0%	40.0%	10.9%	31.8%	31.8%	10.9%	32.7%	32.7%	16.4%	38.2%	38.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.6	2.6	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	51.5	37.1	37.1	38.5	28.2	28.2	40.1	29.6	29.6	50.0	35.5	35.5
Actuated g/C Ratio	0.47	0.34	0.34	0.35	0.26	0.26	0.37	0.27	0.27	0.46	0.32	0.32
v/c Ratio	1.02	0.76	0.29	0.71	0.90	0.40	1.17	0.65	0.32	0.84	0.51	0.14
Control Delay (s/veh)	84.6	37.1	5.0	37.7	54.1	6.6	131.8	39.3	5.3	42.7	32.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.8	0.0
Total Delay (s/veh)	84.6	37.1	5.0	37.7	54.1	6.6	131.8	39.3	5.3	45.6	32.8	0.5
LOS	F	D	A	D	D	A	F	D	A	D	C	A
Approach Delay (s/veh)		44.7			42.9			65.7			34.0	
Approach LOS		D			D			E			C	

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 109.5			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.17			
Intersection Signal Delay (s/veh): 47.4		Intersection LOS: D	
Intersection Capacity Utilization 95.7%		ICU Level of Service F	
Analysis Period (min) 15			

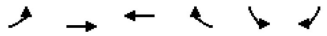
Splits and Phases: 2: Brant Street & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	321	818	167	142	728	204	370	560	161	279	521	76
Future Volume (vph)	321	818	167	142	728	204	370	560	161	279	521	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1755	3510	1526	1689	3444	1520	1772	3510	1558	1754	3476	1478
Flt Permitted	0.12	1.00	1.00	0.20	1.00	1.00	0.40	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	230	3510	1526	355	3444	1520	745	3510	1558	428	3476	1478
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	353	899	184	156	800	224	407	615	177	307	573	84
RTOR Reduction (vph)	0	0	122	0	0	166	0	0	129	0	0	57
Lane Group Flow (vph)	353	899	62	156	800	58	407	615	48	307	573	27
Confl. Peds. (#/hr)	1		12	12		1	1		4	4		1
Heavy Vehicles (%)	4%	4%	4%	8%	6%	6%	3%	4%	3%	4%	5%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	49.1	37.1	37.1	36.2	28.2	28.2	37.6	29.6	29.6	47.5	35.5	35.5
Effective Green, g (s)	49.1	37.1	37.1	36.2	28.2	28.2	37.6	29.6	29.6	47.5	35.5	35.5
Actuated g/C Ratio	0.45	0.34	0.34	0.33	0.26	0.26	0.34	0.27	0.27	0.43	0.32	0.32
Clearance Time (s)	4.0	6.4	6.4	4.0	6.3	6.3	4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	339	1189	517	214	886	391	330	948	421	353	1126	479
v/s Ratio Prot	c0.16	0.26		0.05	0.23		c0.09	0.18		c0.11	0.16	
v/s Ratio Perm	c0.30		0.04	0.19		0.04	c0.33		0.03	0.27		0.02
v/c Ratio	1.04	0.76	0.12	0.73	0.90	0.15	1.23	0.65	0.11	0.87	0.51	0.06
Uniform Delay, d1	31.6	32.2	25.0	27.7	39.3	31.4	33.3	35.3	30.1	23.0	29.9	25.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.0	2.8	0.1	11.7	12.4	0.2	128.5	3.4	0.5	19.8	1.6	0.2
Delay (s)	91.6	35.0	25.1	39.4	51.7	31.5	161.8	38.8	30.6	42.7	31.6	25.7
Level of Service	F	C	C	D	D	C	F	D	C	D	C	C
Approach Delay (s/veh)		47.6			46.3			79.4			34.6	
Approach LOS		D			D			E			C	

Intersection Summary					
HCM 2000 Control Delay (s/veh)	52.6	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	1.13				
Actuated Cycle Length (s)	109.5	Sum of lost time (s)	20.9		
Intersection Capacity Utilization	95.7%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	129	1255	858	31	0	47
Future Volume (Veh/h)	129	1255	858	31	0	47
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.90	0.91
Hourly flow rate (vph)	142	1379	943	34	0	52
Pedestrians		2			1	
Lane Width (m)		3.7			3.7	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			74			
pX, platoon unblocked	0.79				0.79	0.79
vC, conflicting volume	978				1918	475
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	454				1637	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				100	94
cM capacity (veh/h)	887				62	864

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	142	690	690	472	472	34	52
Volume Left	142	0	0	0	0	0	0
Volume Right	0	0	0	0	0	34	52
cSH	887	1700	1700	1700	1700	1700	864
Volume to Capacity	0.16	0.41	0.41	0.28	0.28	0.02	0.06
Queue Length 95th (m)	4.3	0.0	0.0	0.0	0.0	0.0	1.5
Control Delay (s/veh)	9.8	0.0	0.0	0.0	0.0	0.0	9.4
Lane LOS	A						A
Approach Delay (s/veh)	0.9			0.0			9.4
Approach LOS							A

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	45.3%	ICU Level of Service		A
Analysis Period (min)	15			

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.

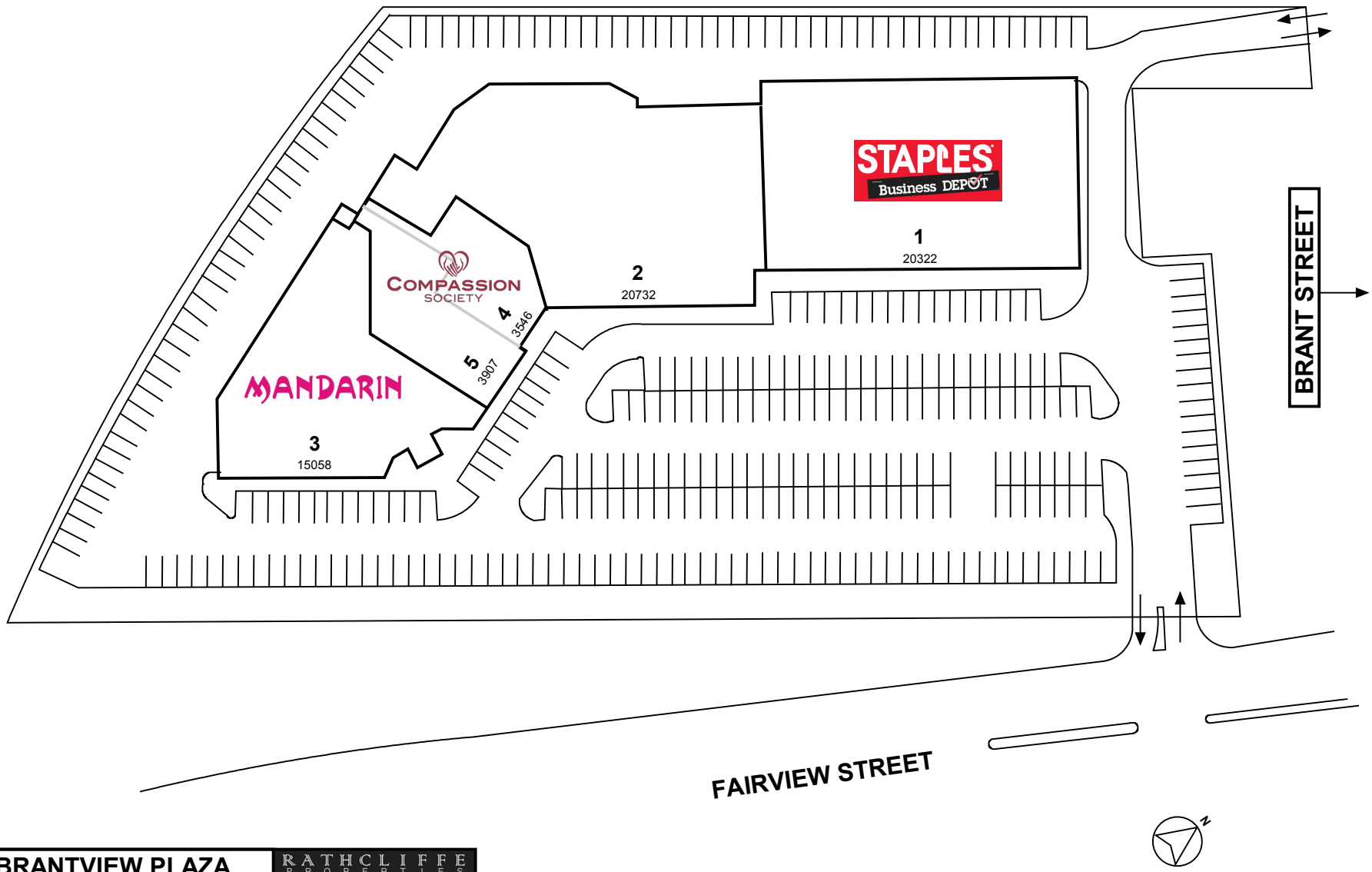
Level of Service	Features
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.
C	Average traffic delays occur. 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.

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

APPENDIX D

Site Plan



BRANTVIEW PLAZA
BURLINGTON, ONTARIO

RATHCLIFFE PROPERTIES
#300-1020 LAWRENCE AVENUE WEST
TORONTO, ONTARIO M6A 1C8
TEL: 416-787-1135
FAX: 416-787-8017
EMAIL: info@rathcliffe.com

SKETCH PLAN ONLY - NOT TO SCALE