688 Brant Street
Burlington ON
Transportation Impact Study
and Parking Study

Paradigm Transportation Solutions Limited

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Project Summary

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact and Parking Justification for the proposed redevelopment of the lands known municipally as 688 Brant Street in the City of Burlington.

This study determines the impacts of the development traffic on the surrounding road network and identifies the impacts associated with site-generated traffic.

Development Concept

The subject site is proposed to be redeveloped to include a 11-storey building consisting of 1,592 m^2 (17,139 sq.ft.) of ground floor retail space, 293 residential high-rise units, and 12 townhouse units.

Vehicular access is proposed via two existing accesses to Brant Street; The North Access is a one-way entrance, and the South Access is a one-way exit to Brant Street aligned at Blairholm Avenue.

The development proposes a parking supply of 435 spaces (435 spaces plus 27 tandem spaces): 379 residential spaces (1.24 spaces per unit), and 56 retail spaces (3.5 spaces per 100 m^2 GFA).

Conclusions.

Transportation Impact Study

This study evaluates existing conditions and the impacts of background traffic growth and projects the impacts of the redevelopment.

Full-build out of the redevelopment will generate 147 AM new peak hour trips and 165 PM new peak hour trips.

Under the future background scenario, localized congestion is forecast at study area intersections. Operations at the Fairview Street and Brant Street intersection are forecast to degrade with background traffic growth, resulting in multiple movements operating at critical levels. In general, left-turning movements from the east-west streets onto Brant Street can be expected to experience some queuing issues. 95th percentile queues are forecast to extend beyond the available storage for certain left-turning movements however, average queue length are forecast to be accommodated by the available storage.

Background traffic growth along Brant Street results in eastbound/westbound traffic from Olga Drive/Rambo Crescent operating with delays in the LOS F range, particularly during the AM peak hour. Though traffic on Olga Drive/Rambo Crescent is not forecast to grow significantly, the delays are expected to grow due to increases in north/south traffic leaving less gaps for the stop-controlled eastbound/westbound movements. A signal could improve traffic operations, however it is not warranted or recommended based on the intersection spacing. It is likely that with increasing delays, neighbourhood traffic will gradually divert to Blairholm Avenue and Ghent Avenue for signalized intersections.

The redevelopment of the subject site is anticipated to have a negligible effect on traffic operations within the study area. Individual movement delays are expected to increase by less than 20 seconds during the AM and PM peak hours as a result of the site traffic. The exception to this being Olga Drive/Rambo Crescent where the critical eastbound/westbound delays are increased further due to the increase in traffic along Brant Street.

The south driveway is forecast to operate with delays in the LOS D range and are not forecast to exceed 45 seconds during the AM and PM peak hours. The inbound movements to the north access are forecast to operate with delays in the LOS B range are not expected to exceed 15 seconds during the AM and PM peak hours.

The analysis indicates the existing transportation infrastructure is adequate for accommodating additional traffic associated with the proposed development. No roadway improvements are required to facilitate the proposed development.

Parking Justification

Parking requirements for the development under the City's Zoning By-Law is 438 parking spaces, equating to a parking rate of 1.25 parking spaces per unit and 3.5 spaces per 100 square metres of retail GFA. The development is proposing a parking supply of 435 spaces (435 spaces plus 27 tandem spaces): 379 residential spaces (1.24 spaces per unit) and 56 retail spaces (3.5 spaces per 100 m^2 GFA). The proposed parking supply is 3 spaces less than the Zoning By-Law requirement.

Parking utilization Surveys over the last several years at a number of different multi-family developments have consistently found that occupant parking demand varies considerably between 0.65 to 1.25 occupant spaces per unit. Additional utilization surveys have been

undertaken at a relatively new condominium development in Downtown Burlington in November 2022.

The site surveyed is located at 2025 Maria Street (The Berkeley) and was constructed in 2018. On-site parking for The Berkely is provided solely for occupants with no accommodation for visitor parking. Based on the survey data, The Berkley registered a peak demand of 0.80 occupant spaces for the survey hours.

Based on empirical survey data that both Paradigm and the City staff have collected at multi-family residential buildings and a review of industry parking data and policy framework of the Growth Plan, the Provincial Policy Statement and Burlington's OP, a reduced parking supply for the proposed development is supportable.

Overall, the proposed parking supply of 435 spaces plus 27 tandem spaces, is appropriate and supportable for the proposed development based on parking data collected by both Paradigm and city staff.

Recommendations

Based on the findings of this study, it is recommended that:

- The City of Burlington recognizes the conclusions drawn above;
- The City continues to monitor traffic operations at study area signalized intersections and adjusts signal timings as needed; and
- The City of Burlington support the proposed Zoning By-law parking rate to allow the provision of 1.24 parking spaces per unit.

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1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation, Parking Justification and Transportation Demand Management Study for the proposed redevelopment of the lands known municipally as 688 Brant Street in the City of Burlington.

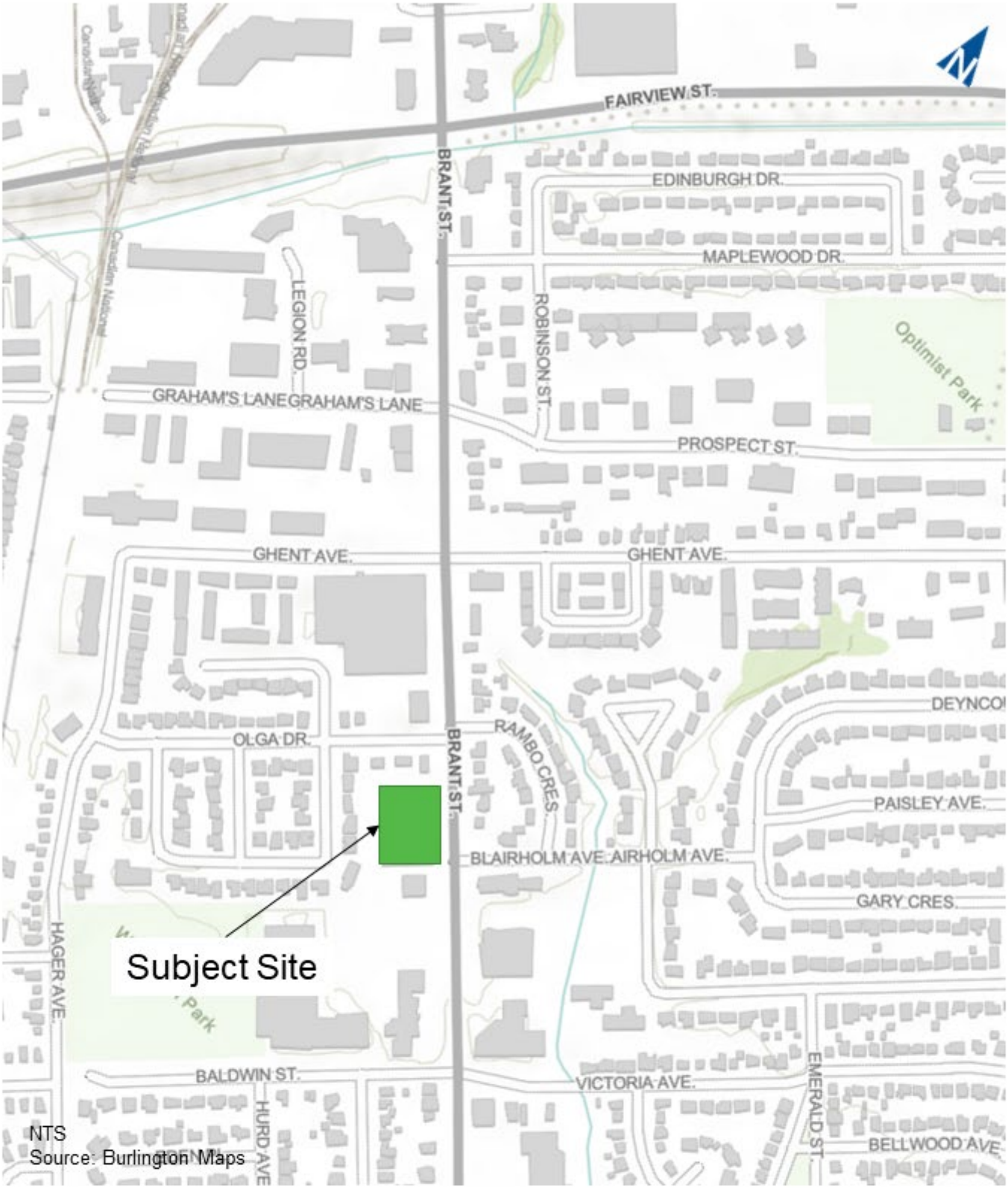
This study determines the impacts of the additional traffic generated by the subject site on the surrounding road network and the remedial measures necessary to accommodate future traffic satisfactorily. The scope of this study includes the following:

- Determine and assess the current study area traffic conditions;
- Forecast the additional traffic generated by the proposed development;
- Analyze the impacts of the additional traffic on the study area intersections for the five years from build-out (2027); and
- Recommend any necessary remedial measures to accommodate future traffic satisfactorily.

The scope of the study was developed in consultation with Halton Region and City of Burlington staff in May 2022. The study follows the Region's Transportation Impact Study Guidelines[1]. **Appendix A** contains the pre-study correspondence and comments.

Figure 1.1 details the subject development location

[1] Transportation Impact Study Guidelines, Halton Region, January 2015



NTS
Source: Burlington Maps

Location of Subject Site

688 Brant Street, Burlington
210691

Figure 1.1

1.2 Study Area

The study area intersections assessed in this study include:

- Brant Street at Fairview Street (signalized);
- Brant Street & Prospect Street/Grahams Lane (signalized);
- Brant Street & Ghent Avenue (signalized);
- Brant Street & Rambo Crescent/Olga Drive (unsignalized);
- Brant Street & Blairholm Avenue (signalized); and
- Brant Street & Victoria Avenue/Baldwin Street (signalized).

2 Existing Conditions

2.1 Existing Roadways

The roadways of interest within the study include:

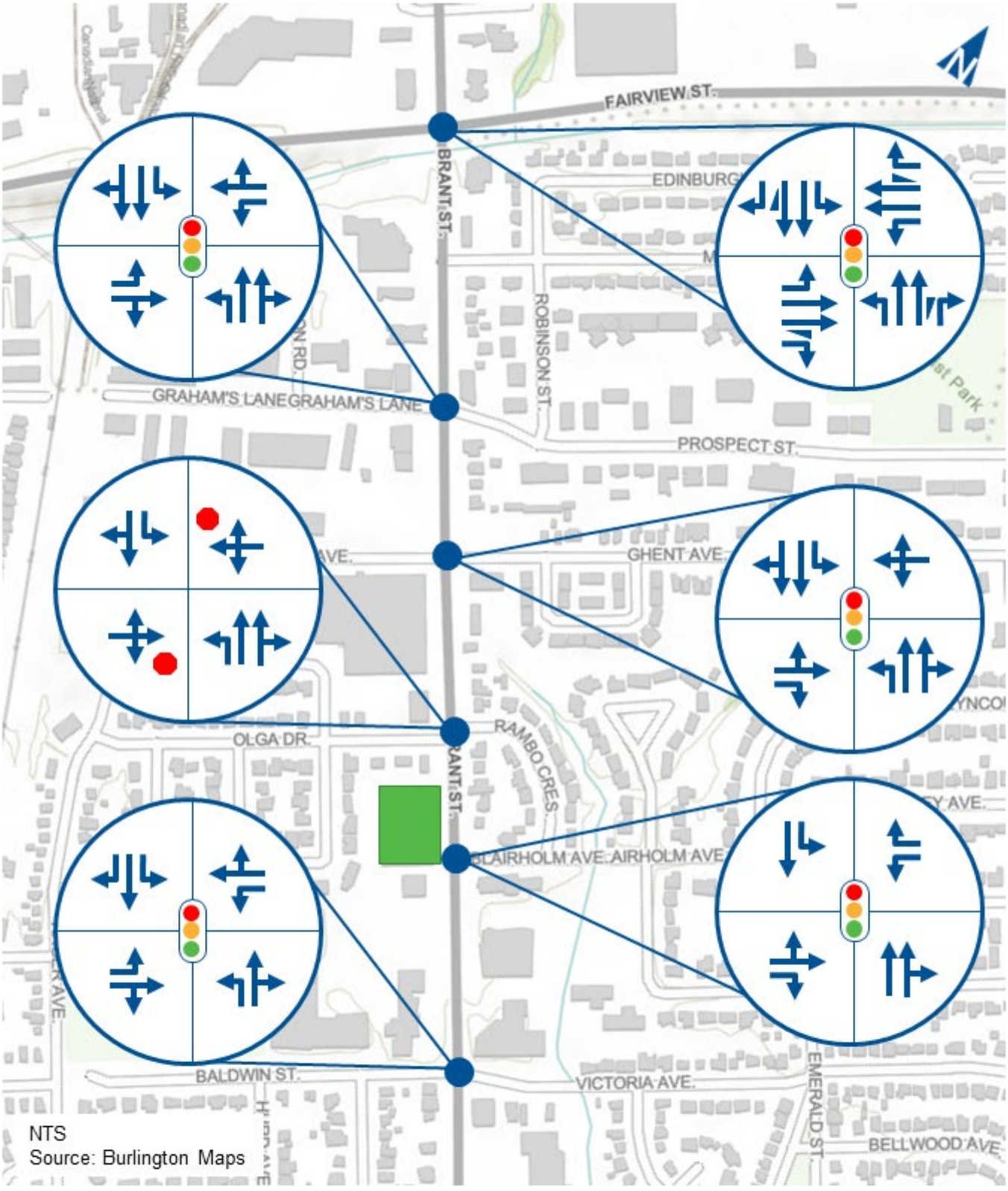
- **Brant Street** is a north-south major arterial[2] roadway north of Fairview Street and is classified as a main street south of Fairview Street. North of Olga Drive, the roadway has a five-lane (two lanes in each direction with a centre two-way left-turn lane). Between Olga Drive and Victoria Avenue, the road has a four-lane cross-section with two northbound lanes, one southbound lane, and a centre two-way left-turn lane. South of Victoria Avenue, the roadway shifts to a three-lane cross-section with one northbound lane, one southbound lane, and a centre two-way left-turn lane. Sidewalks and cycling lanes are present on both sides of the roadway. A statutory speed limit of 50 km/h is assumed.
- **Fairview Street** is an east-west five-lane (three westbound lanes, two eastbound lanes) multi-purpose arterial roadway. Sidewalks and cycling lanes are present on both sides of the road. The statutory speed limit of 50 km/h is assumed.
- **Prospect Street/Grahams Lane** is an east-west two-lane roadway classified as a neighbourhood connector. Sidewalks are present on both sides of the road east of Brant Street and on the north side of the road west of Brant Street. Prospect Street/Grahams Lane is a signed bike route. East of Brant Street, a cycling lane is present on the north side of the road and cycling “sharrows” are painted on the south side of the road. West of Brant Street, cycling “sharrows” are painted on the south side of the road. On-street parking is not permitted along the roadway. A statutory speed limit of 50 km/h is assumed.
- **Ghent Avenue** is an east-west two-lane roadway classified as a local street east of Brant Street and a neighbourhood connector west of Brant Street. A statutory speed limit of 50 km/h is assumed. Sidewalks are present on both sides of the road. No on-street cycling facilities are present on the roadway. No stopping is permitted east of Brant Street, while on-street parking is permitted between 6 AM and 1 AM west of Brant Street.

[2] The City of Burlington Official Plan, Schedule O-1: Classification of Transportation Facilities Urban Area, November 2020

- **Rambo Crescent/Olga Drive** is an east-west two-lane local roadway. Sidewalks are present on both sides of the road. No on-street cycling facilities are present on the street. On-street parking is permitted on the north side of Olga Drive between 6 AM and 1 AM. No on-street parking is permitted on Rambo Crescent between 8 AM and 6 PM (Sundays and holidays excepted). A statutory speed limit of 50 km/h is assumed.
- **Blairholm Avenue** is an east-west two-lane roadway classified as a neighbourhood connector. Sidewalks are present on both sides of the road. No on-street cycling facilities are present on the street. No stopping is permitted. Accessible on-street parking spaces are available along the adjacent elementary school's south side of the roadway. A statutory speed limit of 50 km/h is assumed.
- **Victoria Avenue/Baldwin Street** is an east-west two-lane local[3] roadway. Sidewalks are present on both sides of the road. No on-street cycling facilities are present on the roadway. No stopping is permitted along Baldwin Street and no parking is permitted along Victoria Avenue. The posted speed limit is 40 km/h.

Figure 2.1 displays the traffic control and lane configuration at the study area intersections.

[3] The City of Burlington Official Plan, Schedule O-3: Classification of Transportation Facilities Downtown Urban Centre, November 2020,



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Existing Lane Configuration and Traffic Control

688 Brant Street, Burlington
210691

Figure 2.1

2.2 Transit Service

2.2.1 City of Burlington Transit Service

Burlington Transit (BT) is the public transit operator for the City of Burlington and operates several routes within the study area. Currently, BT operates two routes adjacent to the subject site:

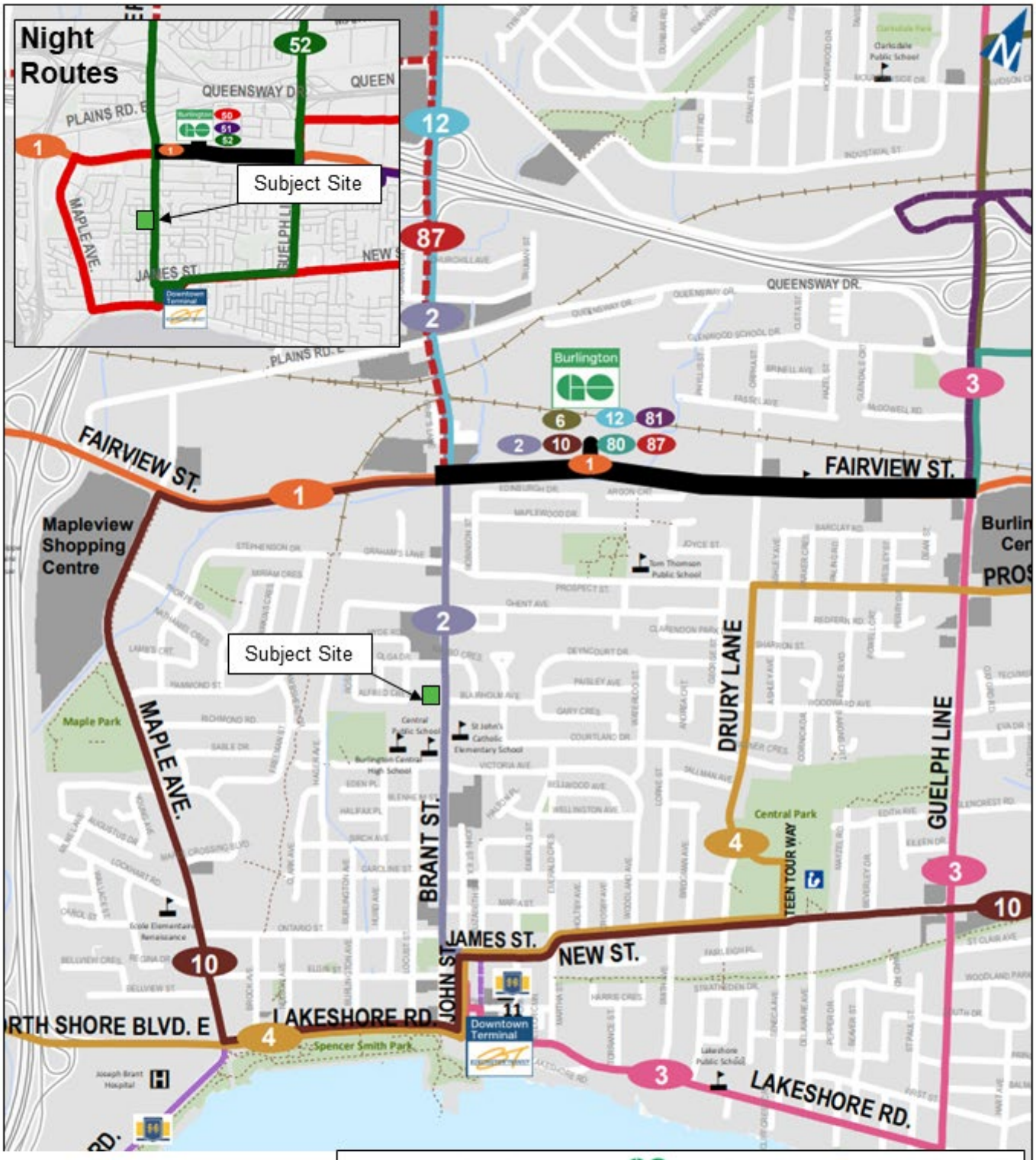
- **Route 2 (Brant North)** runs between the Burlington GO Station and the Highway 407 Carpool Lot via Downtown Burlington. The route runs with approximately 15-minute headways during weekday peak hours, and 30-minute headways during other service hours.
- **Route 52 (Burlington Northwest)** provides late night service around the northwest portion of the City emanating and terminating at the Burlington GO Station. The service runs between 10:55 PM and 1:22 AM, Monday to Saturday. Buses operate with one-hour headways and stop in Downtown Burlington.

The nearest stop for both routes is located at the intersection of Brant Street and Blairholm Avenue, less than 100 m (two-minute walk) from the subject site.

Figure 2.2 illustrates the existing transit network.

2.2.2 GO Transit Service

The Burlington GO station is located about 1.4 kilometres north of the subject site and approximately a 20-minute walk or two-minute transit ride on Routes 2 and 52. Since this GO line provides train service to Mississauga and Downtown Toronto, it is expected that the subject site will attract residents that will use both City transit and inter-regional transit for commuting purposes



NTS
Image Source: Burlington Transit

Existing Transit Network

688 Brant Street, Burlington
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Figure 2.2

2.3 Active Transportation

2.3.1 Walkability

Pedestrian sidewalks are provided along both sides of the roadways throughout most of the study area. Crosswalks, pedestrian pushbuttons, and indicators are provided for all approaches at the signalized intersections within the study area.

The subject site is located within walking distance (less than one kilometre) of numerous significant employment, retail, cultural and recreational opportunities providing for a range of destinations for prospective residents of the proposed building that can be readily accessed without the use of a car. The proximity of the site to such a range of amenities and destinations within walking distance serves to reduce the need for residents of the building to travel on a regular basis using a car.

Walk Score is an online tool that assigns a numerical walkability score between 0 and 100 for addresses in Australia, Canada, United States, and New Zealand. Walk Score ranks communities nationwide based on how many businesses, parks, theatres, schools and other common destinations are within walking distance of any given address. The subject site is noted to have a Walk Score of 77 and is considered a "Very Walkable" location which means most daily errands can be accomplished on foot[4].

2.3.2 Cycling

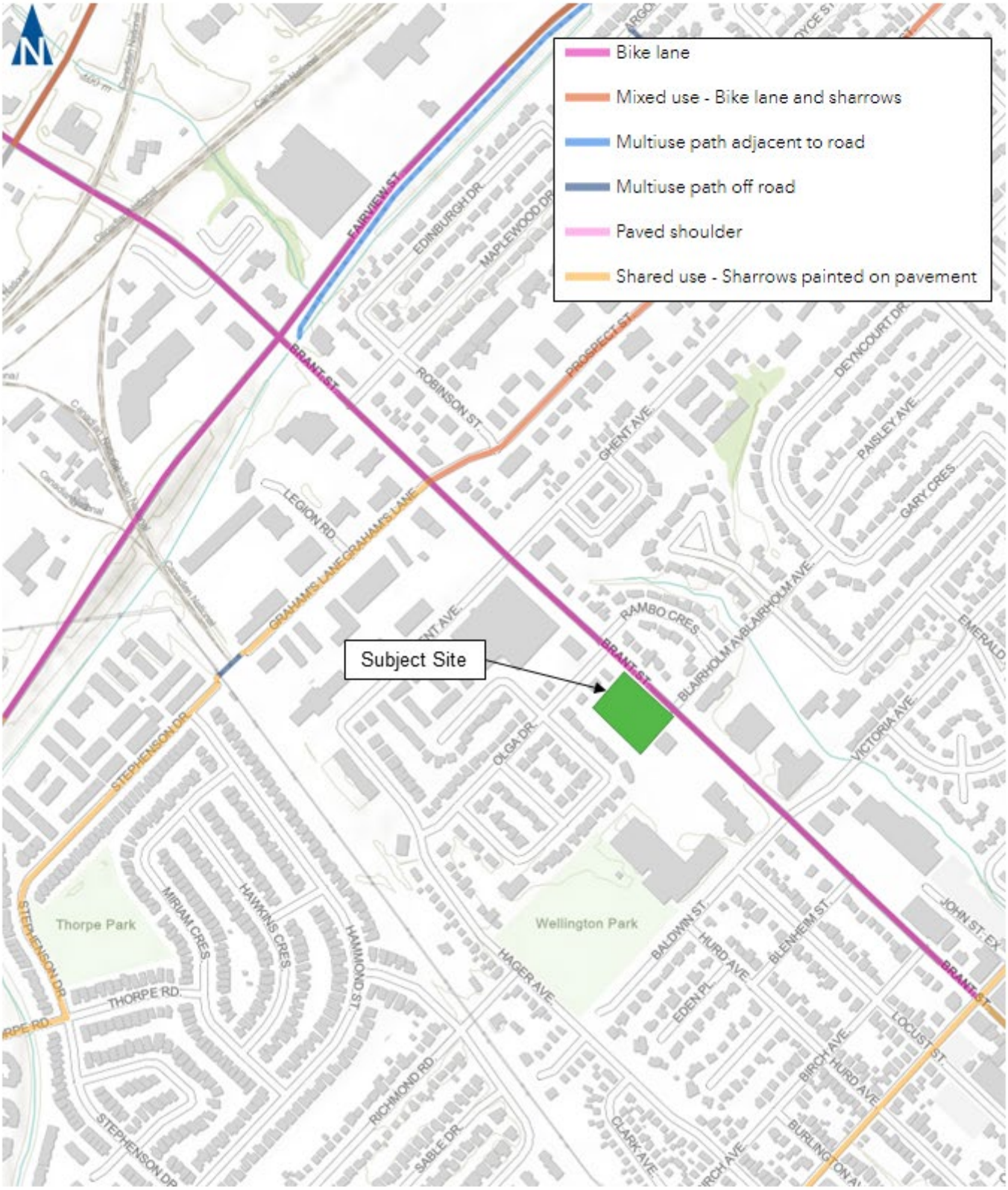
The City's cycling infrastructure consists of on-street and off-street facilities. On-street routes are comprised of bicycle lanes, signed bicycle routes, and paved shoulders. Off-street facilities are in the form of multi-use paths.

The City's Interactive Map identifies several cycling facilities on the study area roadways. Bike lanes are present on Brant Street, Fairview Street, and on the north side of Prospect Street. A multi-use path runs adjacent to Fairview Street, east of Brant Street.

Shared use shoulders ("sharrows") are present along the south side of Prospect Street and along Grahams Lane. Brant Street currently operates with bike lanes north of Caroline Street.

Figure 2.3 illustrates the existing cycling network within the study area.

[4] https://www.walkscore.com/score/688-brant-st-burlington-on-canada



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Existing Cycling Network

688 Brant Street, Burlington
210691

Figure 2.3

2.4 Existing Traffic Volumes

To assess intersection operations, turning movement counts are used to quantify the movement of vehicles through the area. The counts are usually taken during peak periods at an intersection to complete the level of service analysis under its worst-case operating conditions. Existing traffic data at an intersection or on a road section forms the foundation for the analysis.

Table 2.1 provides a summary of the traffic count locations and sources. **Appendix B** contains the detailed traffic counts for study area intersections.

TABLE 2.1: TRAFFIC COUNT LOCATION AND SOURCE

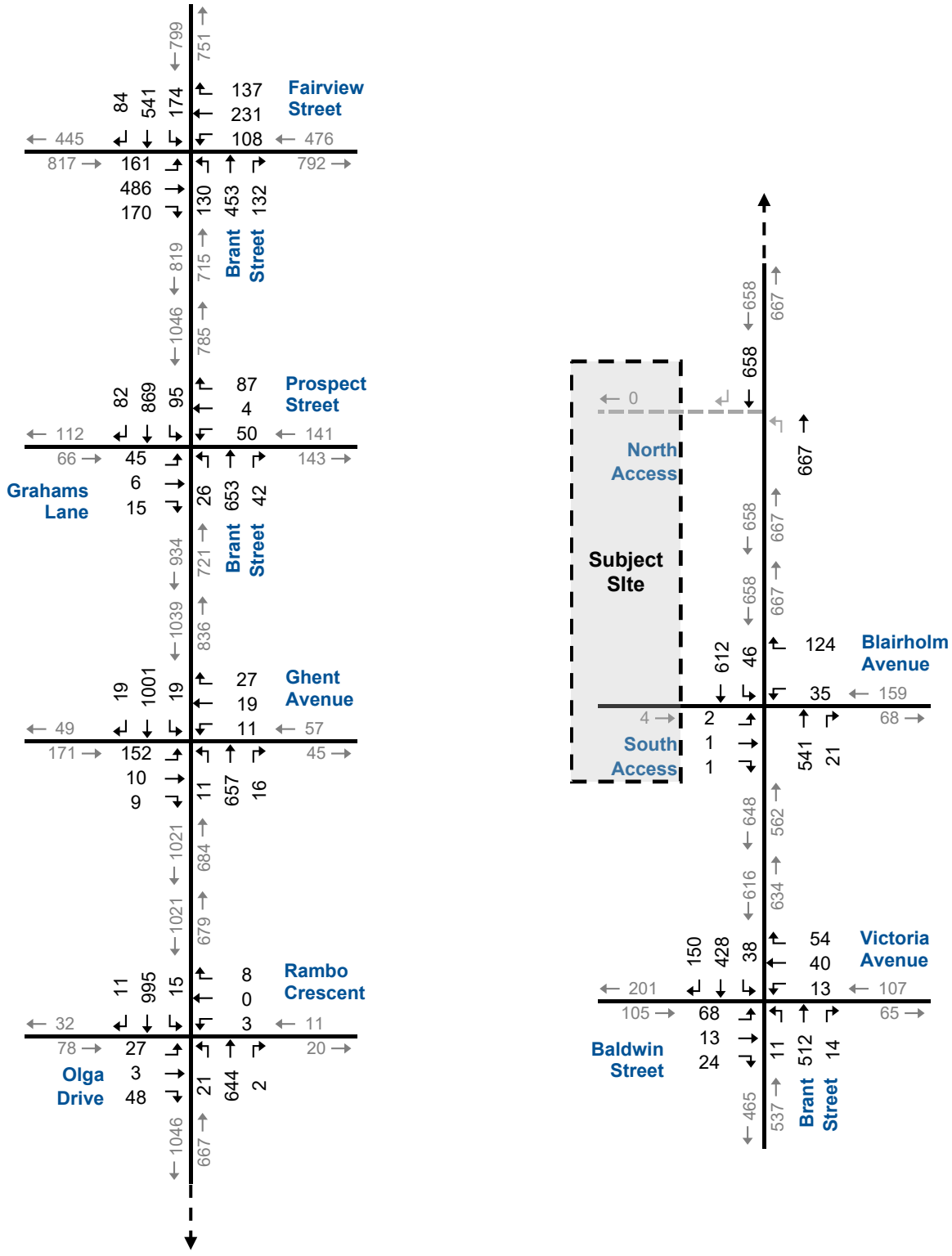
Intersection	Date	Conducted By
Fairview Street & Brant Street & Brant Street	September 2020	Accu-Traffic
Prospect Street/Grahams Lane & Brant Street	November 2022	City of Burlington
Ghent Avenue & Brant Street	June 2022	City of Burlington
Olga Drive/Rambo Crescent & Brant Street	September 2015	City of Burlington
Blairholm Avenue/South Access & Brant Street	September 2022	City of Burlington
Baldwin Street/Victoria Avenue & Brant Street	October 2022	Pyramid

A generalized growth rate of 2.0% per annum is used to adjust the count data to the base year of 2022 as specified by the City[5] with the exception of Olga Drive/Rambo Crescent at Brant Street.

For the intersection of Olga Drive/Rambo Crescent & Brant Street no recent count data was available at the time of study. A review of historical traffic data for east-west local streets in the corridor showed minimal growth between 2019 and 2022. Considering the age of the count and the historical growth in the corridor, no traffic growth was assumed on Olga Drive/Rambo Crescent from the date of the count. This assumption is further supported by the neighbourhoods being mainly developed single-detached houses. Northbound/southbound traffic along Brant Street at this intersection was assumed to be the consistent with upstream intersections.

[5] Appendix A – Terms of Reference

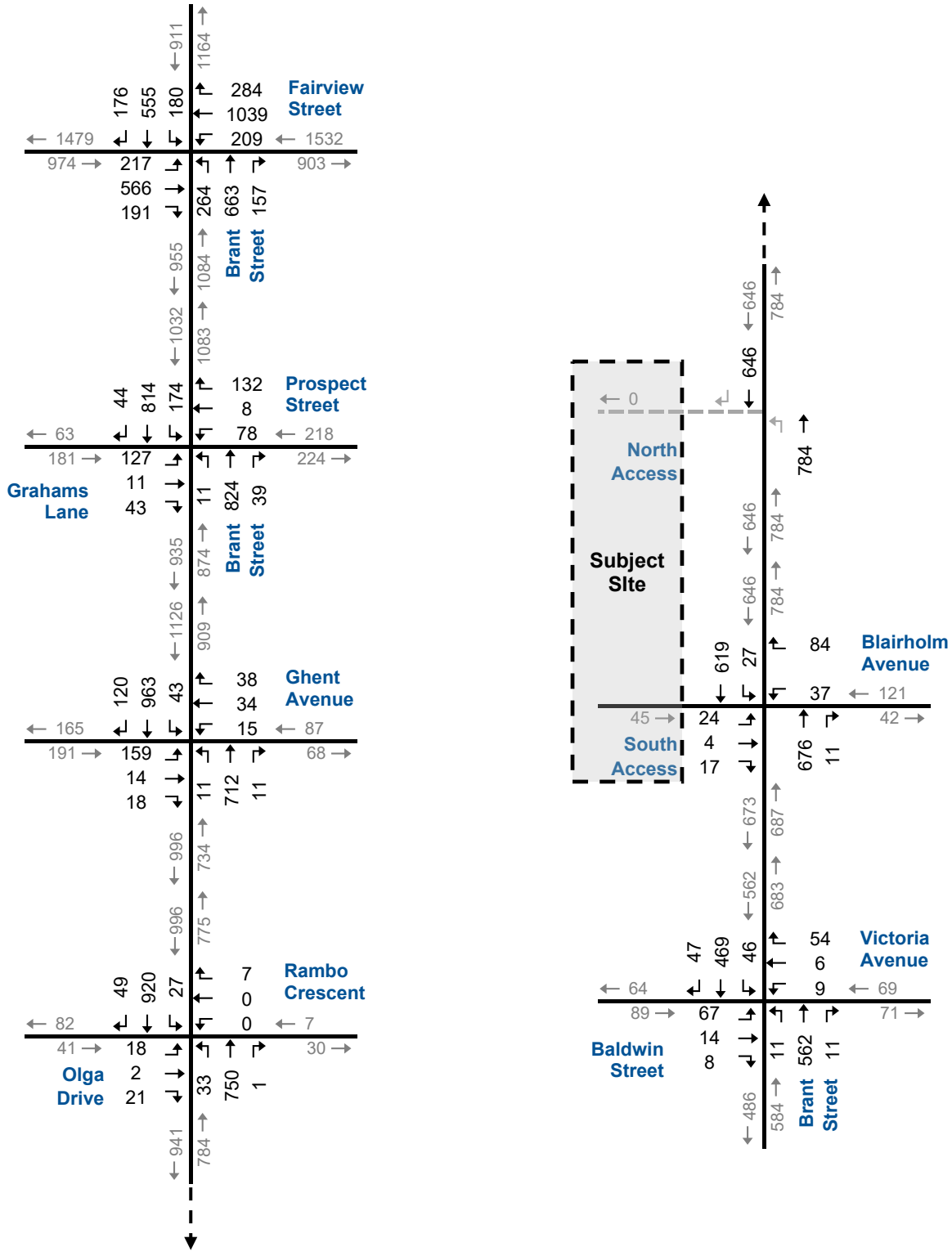
Figure 2.4a and **Figure 2.4b** display the existing AM and PM weekday peak hour turning movement traffic volumes, respectively.



Base Year Traffic Volumes
AM Peak Hour

688 Brant Street, Burlington
210691

Figure 2.4a



Base Year Traffic Volumes
PM Peak Hour

688 Brant Street, Burlington
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Figure 2.4b

2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing the various movements at an intersection. The delay is related to the number of vehicles desiring to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on several criteria including, but not limited to, vehicle headways, intersection geometry, vehicle composition, opposing traffic flows, and for signalized intersections, signal timing.

Table 2.2 summarizes the level of service criteria for signalized and stop controlled intersections. The highest possible rating is LOS A, under which the average total delay is equal to or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections or 50 seconds for unsignalized intersections, or when the volume-to-capacity (v/c) ratio is greater than 1.00, the movement is classified as LOS F, and improvements are usually implemented, if feasible. LOS D is typically considered acceptable peak-hour performance in an urban setting, and lower LOS values are tolerable for short term time periods during peak hours when heavier traffic volumes are expected.

TABLE 2.2: VEHICLE LEVEL OF SERVICE DEFINITIONS

Level of Service	Signalized Intersections Average Total Delay (sec/veh)	Unsignalized Intersections Average Total Delay (sec/veh)
A	< = 10	< = 10
B	> 10 & < = 20	> 10 & < = 15
C	> 20 & < = 35	> 15 & < = 25
D	> 35 & < = 55	> 25 & < = 35
E	> 55 & < = 80	> 35 & < = 50
F	> 80	> 50

The operations of the intersections in the study area were evaluated with the base year traffic volumes using Synchro 11. The intersection analysis considered the following measures of performance:

- The volume-to-capacity ratio for each intersection;
- The LOS, based on the average control delay for each vehicle, for each turning movement; and
- The estimated 95th percentile queue length.

Movements are considered critical under the following conditions for signalized intersections:

- Volume/capacity (V/C) ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.85 or above;
- V/C ratios for exclusive turning movements increased to 0.95 or above; or
- Queues for an individual movement are projected to exceed available turning lane storage.

Movements are considered critical under the following conditions for unsignalized intersections:

- Level of Service (LOS), based on average delay per vehicle, on individual movements exceeds LOS “D”; or
- The estimated 95th percentile queue length for an individual movement exceeds the available queue storage.

Table 2.3 and **Table 2.4** summarize the results of the analysis for the existing weekday AM and PM peak hour intersection operations and indicate the following capacity issues are occurring:

Fairview Street and Brant Street

- The eastbound left-turn movement operates with delays in the LOS F range with a v/c ratio above 1.00 during the PM peak hour.
- The westbound through movement operates with delays in the LOS D range with a v/c ratio above 0.85 during the PM peak hour.

Prospect Street/Grahams Lane and Brant Street

- The eastbound left-turn lane operates with 95th percentile queue lengths extending beyond the available storage during the PM peak hour.
- The westbound left-turn lane operates with 95th percentile queue lengths extending beyond the available storage during the AM and PM peak hours.

Olga Drive/Rambo Crescent and Brant Street

- The eastbound approach operates with delays in the LOS F range. However, the v/c ratio for the approach is under 0.55 suggesting lane capacity is available.

Blairholm Avenue and Brant Street

- The westbound approach lane operates with 95th percentile queue lengths extending beyond the available storage during the AM and PM peak hours.

Victoria Avenue/Baldwin Street and Brant Street

- The eastbound left-turn lane operates with 95th percentile queue lengths extending beyond the available storage during the AM and PM peak hours.

Appendix C contains the detailed Synchro Reports.

TABLE 2.3: BASE YEAR TRAFFIC OPERATIONS – AM PEAK HOUR

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Fairview Street & Brant Street	TCS	LOS	C	D	D	**D**	D	D	D	**D**	B	C	B	**C**	B	C	B	**B**	**C**
			Delay	29	45	35	**40**	37	42	40	**40**	15	22	20	**20**	14	22	18	**20**	**29**
			V/C	0.46	0.74	0.12		0.53	0.46	0.10		0.31	0.33	0.10		0.38	0.38	0.07		**0.50**
			Q	42	73	17		30	39	9		27	62	6		35	71	2		
			Ex	--	--	190		75	--	--		85	--	80		55	--	90		
			Avail.	--	--	173		45	--	--		58	--			20	--			
	2 - Prospect Street/Grahams Lane & Brant Street	TCS	LOS	D	D	>	**D**	D	D	>	**D**	A	A	>	**A**	A	A	>	**A**	**A**
			Delay	42	37	>	**40**	41	38	>	**39**	4	4	>	**4**	4	8	>	**8**	**10**
			V/C	0.46	0.06	>		0.45	0.09	>		0.10	0.34	>		0.20	0.47	>		**0.45**
			Q	19	8	>		21	14	>		3	23	>		8	74	>		
			Ex	40	--	>		20	--	>		20	--	>		20	--	>		
			Avail.	21	--	>		-1	--	>		17	--	>		12	--	>		
	3 - Ghent Avenue & Brant Street	TCS	LOS	<	D	C	**D**	<	C	>	**C**	A	A	>	**A**	A	A	>	**A**	**A**
			Delay	<	41	30	**41**	<	31	>	**31**	7	9	>	**9**	2	4	>	**4**	**10**
			V/C	<	0.68	0.01		<	0.13	>		0.04	0.30	>		0.04	0.45	>		**0.50**
			Q	<	45	0		<	14	>		3	41	>		1	10	>		
			Ex	<	--	25		<	--	>		45	--	>		30	--	>		
			Avail.	<	--	25		<	--	>		42	--	>		29	--	>		
	4 - Olga Drive/Rambo Crescent & Brant Street	TWSC	LOS	<	F	>	**F**	<	C	>	**C**	A	A	>	**A**	A	A	>	**A**	
			Delay	<	53	>	**53**	<	21	>	**21**	0	0	>	**1**	10	0	>	**0**	
			V/C	<	0.54	>		<	0.05	>		0.27	0.14	>		0.02	0.64	>		
			Q	<	22	>		<	1	>		0	0	>		1	0	>		
			Ex	<	--	>		<	--	>		20	--	>		15	--	>		
			Avail.	<	--	>		<	--	>		20	--	>		15	--	>		
	5 - Blairholm Avenue/South Access & Brant Street	TCS	LOS	<	D	D	**D**	D		D	**D**		A	>	**A**	A	A		**A**	**A**
			Delay	<	36	36	**36**	39		37	**37**		4	>	**4**	3	7		**7**	**9**
			V/C	<	0.03	0.00		0.35		0.10			0.28	>		0.11	0.55			**0.53**
			Q	<	3	0		16		14			22	>		5	48			
			Ex	<	--	--		15		--			--	>		15	--			
			Avail.	<	--	--		-1		--			--	>		10	--			
	6 - Baldwin Street/Victoria Avenue & Brant Street	TCS	LOS	D	D	>	**D**	D	D	>	**D**	A	A	>	**A**	A	A	A	**A**	**A**
			Delay	45	36	>	**42**	36	38	>	**38**	3	5	>	**5**	2	3	4	**3**	**9**
			V/C	0.59	0.10	>		0.11	0.30	>		0.02	0.40	>		0.07	0.33	0.11		**0.43**
			Q	25	11	>		8	21	>		2	61	>		3	47	7		
			Ex	15	--	>		40	--	>		15	--	>		45	--	50		
			Avail.	-10	--	>		33	--	>		13	--	>		42	--	43		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage

TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

TABLE 2.4: BASE YEAR TRAFFIC OPERATIONS – PM PEAK HOUR

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Fairview Street & Brant Street	TCS	LOS	F	D	C	E	C	D	C	D	C	D	C	D	C	D	C	D	D
			Delay	134	36	31	57	24	46	29	40	30	39	31	36	28	40	33	36	42
			V/C	1.13	0.56	0.13		0.58	0.89	0.23		0.70	0.64	0.11		0.58	0.58	0.12		0.90
			Q	98	84	18		47	157	25		64	106	17		44	87	18		
			Ex	--	--	190		75	--	--		85	--	80		55	--	90		
			Avail.	--	--	173		28	--	--		21	--			11	--			
	2 - Prospect Street/Grahams Lane & Brant Street	TCS	LOS	D	C	>	D	D	C	>	C	A	A	>	A	A	B	>	B	B
			Delay	50	33	>	45	36	33	>	34	5	7	>	7	7	12	>	11	15
			V/C	0.73	0.08	>		0.41	0.13	>		0.04	0.46	>		0.42	0.45	>		0.50
			Q	46	12	>		27	18	>		2	28	>		16	67	>		
			Ex	40	--	>		20	--	>		20	--	>		20	--	>		
			Avail.	-6	--	>		-7	--	>		18	--	>		4	--	>		
	3 - Ghent Avenue & Brant Street	TCS	LOS	<	D	C	D	<	C	>	C	A	A	>	A	A	A	>	A	A
			Delay	<	38	29	37	<	30	>	30	5	6	>	6	5	6	>	6	10
			V/C	<	0.65	0.01		<	0.18	>		0.05	0.34	>		0.12	0.52	>		0.55
			Q	<	48	1		<	19	>		2	25	>		6	42	>		
			Ex	<	--	25		<	--	>		45	--	>		30	--	>		
			Avail.	<	--	24		<	--	>		43	--	>		24	--	>		
	4 - Olga Drive/Rambo Crescent & Brant Street	TWSC	LOS	<	D	>	D	<	B	>	B	A	A	>	A	A	A	>	A	
			Delay	<	26	>	26	<	11	>	11	0	0	>	1	10	0	>	0	
			V/C	<	0.21	>		<	0.01	>		0.32	0.16	>		0.04	0.62	>		
			Q	<	6	>		<	0	>		0	0	>		1	0	>		
			Ex	<	--	>		<	--	>		20	--	>		15	--	>		
			Avail.	<	--	>		<	--	>		20	--	>		14	--	>		
	5 - Blairholm Avenue/South Access & Brant Street	TCS	LOS	<	D	D	D	D		D	D		A	>	A	A			A	B
			Delay	<	39	38	39	41		38	39		5	>	5	6	9		8	10
			V/C	<	0.20	0.01		0.37		0.06			0.27	>		0.05	0.46			0.45
			Q	<	13	1		16		13			42	>		5	92			
			Ex	<	--	--		15		--			--	>		15	--			
			Avail.	<	--	--		-1		--			--	>		10	--			
	6 - Baldwin Street/Victoria Avenue & Brant Street	TCS	LOS	D	D	>	D	D	D	>	D	A	A	>	A	A	A	A	A	A
			Delay	43	37	>	42	37	37	>	37	3	5	>	5	3	4	4	4	9
			V/C	0.55	0.09	>		0.09	0.09	>		0.02	0.47	>		0.10	0.39	0.04		0.48
			Q	25	9	>		6	12	>		2	69	>		6	39	3		
			Ex	15	--	>		40	--	>		15	--	>		45	--	50		
			Avail.	-10	--	>		34	--	>		13	--	>		39	--	47		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage

TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

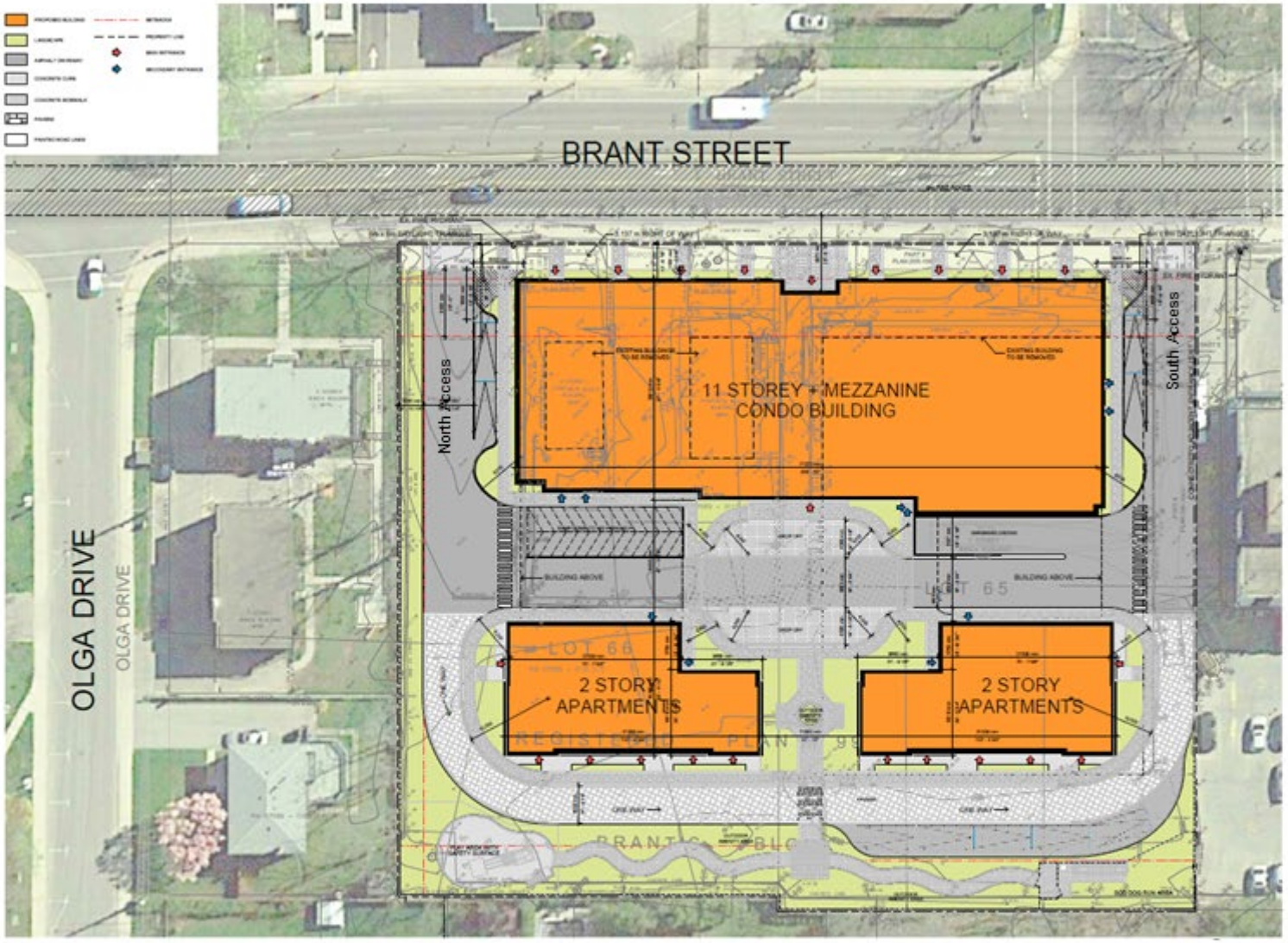
3 Development Concept

3.1 Site Description

The subject site is proposed to be redeveloped to include a 12-storey building consisting of 1,592 m^2 (17,139 sq.ft.) of ground floor retail space, 293 residential high-rise units, and 12 townhouse units.

Vehicular access is proposed via two existing accesses to Brant Street; The North Access is a one-way entrance, and the South Access is a one-way exit to Brant Street aligned at Blairholm Avenue.

Figure 3.1 shows the development concept.



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Site Concept Plan

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Figure 3.1

3.2 Development Trip Generation

The following land use codes from the Institute of Transportation Engineers (ITE) Trip Generation 11th Edition[6] were used to estimate the vehicular weekday AM and PM peak hour traffic volumes generated by the development:

- Multifamily Housing (High-Rise) (LUC 222);
- Multifamily Housing (Low-Rise) (LUC 220); and
- Retail Plaza (LUC 822).

Data for the peak hour of adjacent street traffic were used to estimate site trip generation. Fitted curve equations with satisfactory R^2 values and independent variables were applied. The average rates have been applied if no equations were provided or satisfactory R^2 values and independent variables were unavailable.

The resulting summation is the "raw" trip generation – unadjusted for modal split credits. The effects of these other factors on the actual net new trip generation on the local roadway system are discussed in detail in the following sections.

3.2.1 Internal Capture

The ITE Trip Generation Handbook[7] describes a multi-use development as a single project that consists of two or more ITE land use classifications in which trips can be made between land uses without using the off-site roadway system. This sharing of trips between compatible land uses, without traveling off-site, is an internal capture.

Based on this information, the proposed development is considered multi-use, with compatible commercial land, and uses that are likely to share – or capture – trips that do not require vehicular travel outside the site.

By way of example, likely, some portion of the traffic destined to and from the retail uses located within site will originate from the on-site residential units, requiring only a walking trip. The ITE Trip Generation Handbook has been utilized to account for internal trips within the

[6] Institute of Transportation Engineers, Trip Generation Manual, 11th ed., (Washington, DC: ITE, 2021)
[7] Institute of Transportation Engineers, Trip Generation Handbook, 3rd ed., (Washington, DC: ITE, 2017).

development. **Appendix D** provides the detailed calculations for reference.

ITE data suggests an internal capture rate of 3-18% for the AM and PM peak hours.

3.2.2 Pass-By Trips

Pass-by trips are a subset of a trip generation that only applies to commercial/retail developments. These trips are made by vehicles already present on the roadway, which businesses attract them to their site as they pass by. The estimates of pass-by trips were derived using the ITE Trip Generation Handbook.

An example of a pass-by trip is a vehicle driving from home to work and stopping for coffee on the way. It is noted that pass-by trips are already included in the background traffic stream and do not load additional traffic onto the road network. The ITE Trip Generation Handbook provides a 34% pass-by trip rate for LUC 820 Shopping Centre during the weekday PM peak hour. No information is available for a pass-by rate during the weekday AM peak hour.

3.2.3 Net Trip Generation Estimates

Table 3.1 summarizes the projected trip generation associated with the build-out/occupancy of the development. As noted earlier, these estimates were based on the standardized ITE rates with internal and pass-by credits.

To remain conservative, no reductions accounting for alternative modes of transportation have been applied (i.e., transit trips, etc.). The development is estimated to generate 147 AM new peak hour trips and 165 PM new peak hour trips. Including pass-by trips, there are 147 AM peak hour trips and 197 PM peak hour trips to the subject site.

Table 3.2 summarizes the estimated trip distribution for the subject site. The estimated trip distribution is based on traffic count data (i.e., existing travel patterns) and Transportation Tomorrow Survey[8] (TTS) data for the subject site zone. **Appendix E** contains the TTS data for reference.

[8] Data Management Group, Transportation Tomorrow Survey 2016, University of Toronto, 2016

TABLE 3.1: TRIP GENERATION

ITE Land Use Code / Number of Units	Trips	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Sum	Rate	In	Out	Sum
222 - Multifamily Housing (High-Rise) - 293 Units	Total	Eqn.	28	55	**83**	Eqn.	55	44	**99**
	Internal	2%	1	1	**2**	21%	15	6	**21**
	New	0%	27	54	**81**	0%	40	38	**78**
220 - Multifamily Housing (Low-Rise) - 12 Units	Total	Eqn.	6	21	**27**	Eqn.	16	10	**26**
	Internal	0%	0	0	**0**	0%	0	0	**0**
	New	0%	6	21	**27**	0%	16	10	**26**
822 - Retail Plaza (<40k GFA) - 17,136 sq.ft	Total	Eqn.	25	16	**41**	Eqn.	57	57	**114**
	Internal	5%	1	1	**2**	18%	6	15	**21**
	Pass-by	--	0	0	**0**	34%	16	16	**32**
	New	--	24	15	**39**	--	35	26	**61**
Total	**Total**	--	**59**	**92**	**151**	--	**128**	**111**	**239**
	Internal	3%	**2**	**2**	**4**	18%	**21**	**21**	**42**
	Pass-by	0%	**0**	**0**	**0**	13%	**16**	**16**	**32**
	New	97%	**57**	**90**	**147**	69%	**91**	**74**	**165**
	New + Pass-by	**97%**	**57**	**90**	**147**	**82%**	**107**	**90**	**197**

Equations

LUC 222 Eqn. per Unit AM: T = 0.22(X) + 18.85 | PM: T = 0.26(X) + 23.12

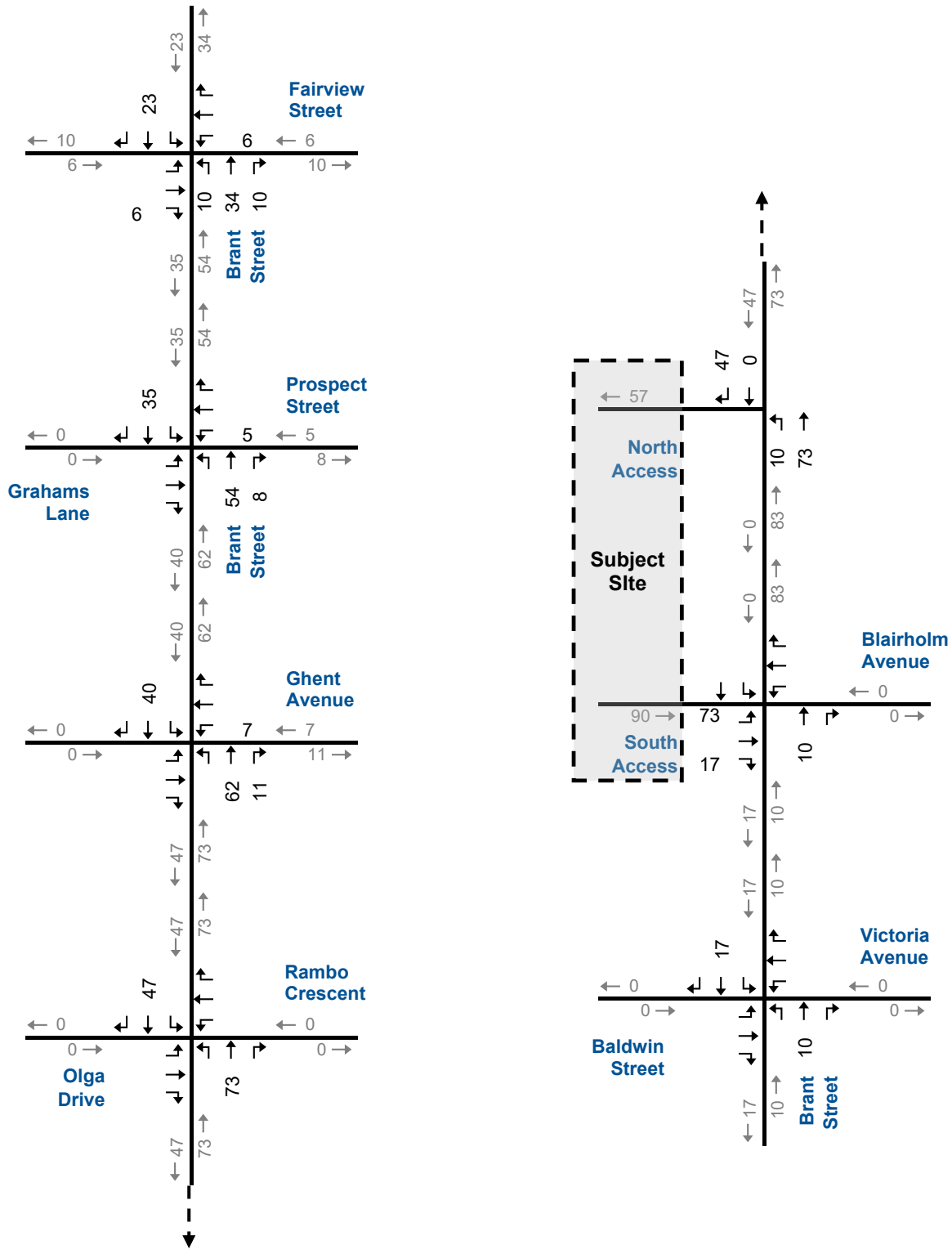
LUC 220 Eqn. per Unit AM: T = 0.31(X) + 22.85 | PM: T = 0.43(X) + 20.55

LUC 822 Eqn. per 1,000 sq.ft. GFA AM: Ln(T) = 0.66 Ln(X) + 1.84 | PM: Ln(T) = 0.71 Ln(X) + 2.72

TABLE 3.2: TRIP DISTRIBUTION

Travel To/From		Inbound	Outbound
North	Brant Street	39%	38%
East	Fairview Street	12%	12%
	Prospect Street	9%	9%
	Ghent Avenue	12%	12%
	Blairholm Avenue	0%	0%
South	Brant Street	18%	19%
West	Fairview Street	11%	11%
	Grahams Lane	0%	0%
	Ghent Avenue	0%	0%
	Total	**100%**	**100%**

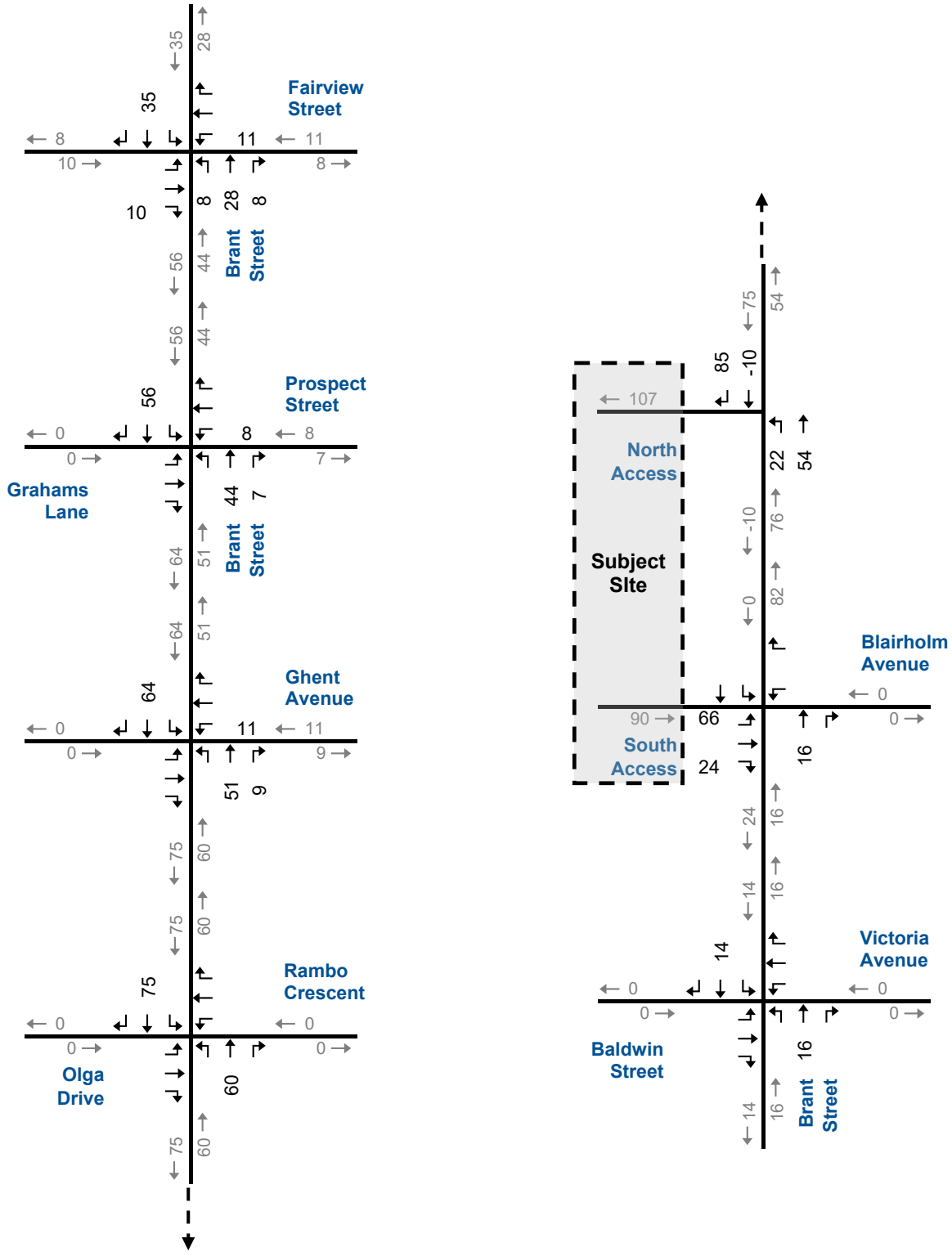
Figure 3.2a illustrates the site-generated traffic volumes for the AM peak hour. **Figure 3.2b** illustrates the net site-generated traffic volumes for the PM peak hour. **Appendix F** provides detailed assignment of new site trips and pass-by trips. Future horizon



Site Generated Traffic Volumes
AM Peak Hour

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Figure 3.2a



Site Generated Traffic Volumes
PM Peak Hour

688 Brant Street, Burlington
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Figure 3.2b

4 Future Traffic Conditions

To be consistent with the terms of reference established with the City of Burlington and with the Region of Halton's Transportation Impact Study Guidelines, the horizon year of 2027, five (5) years beyond the date of TIS, has been used for traffic forecasting and analysis purposes.

4.1 Background Growth

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. A frequently used procedure is to estimate an annual percentage increase and apply that increase to the study area traffic volumes. An alternative procedure is to identify estimated traffic generated by specific planned major developments that would be expected to affect the project study area roadways. For this assessment, both methods were used.

4.1.1 General Background Growth

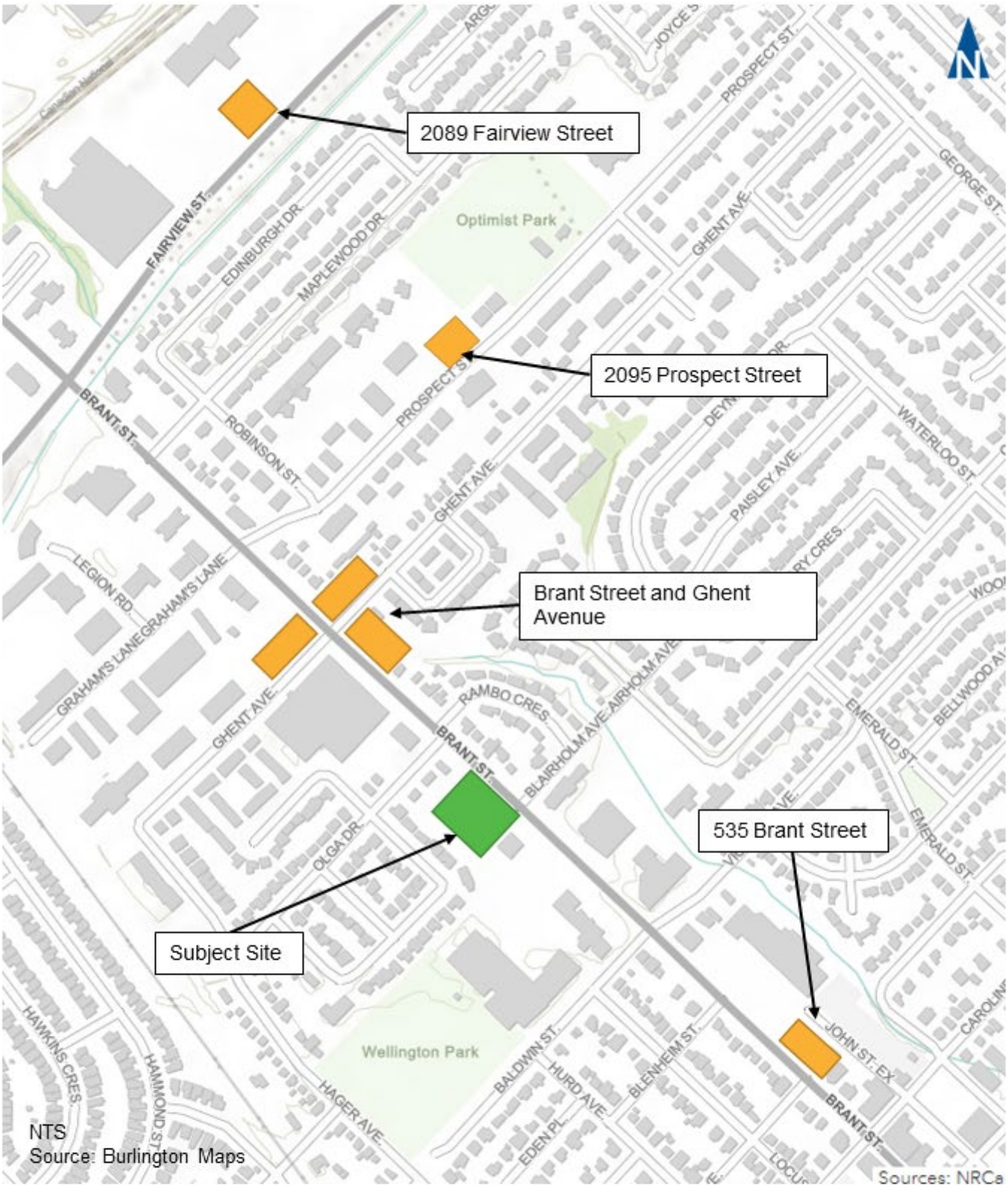
Generalized traffic growth was determined by applying a growth rate of 2.0% per annum to the base year volumes. This growth rate was confirmed with City staff during pre-consultation.

4.1.2 Approved or In-Stream Developments

In year 2027, it is possible that there will be other new developments in the area that will also increase the traffic volumes on the study area roadways.

There are several approved or in-stream residential and commercial developments within close proximity of the study area.

Figure 4.1 illustrates the general locations of these area developments. **Table 4.1** outlines the expected number of units.



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Approved of In-Stream Developments

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Figure 4.1

TABLE 4.1: APPROVED OF IN-STREAM DEVELOPMENTS

Development	Development Plans
535-551 Brant Street	Mixed-use 26 storey building with 1,191 m^2 of ground floor retail space and 259 residential units
2095 Prospect Street	50 new stacked townhouse apartments
Brant Street & Ghent Street	Multiple buildings ranging from 8 to 25 storeys totaling 881 residential units with 1,286 m^2 of ground floor retail space. Phase 1, to be built out and populated by 2027, consists of 425 residential units and 794 m^2 of ground floor retail.
2089 Fairview Street	Two 18-storey mixed-used towers consisting of 364 residential units and 1,744 m^2 of commercial space.

Appendix G contains the in-stream development forecast traffic volumes.

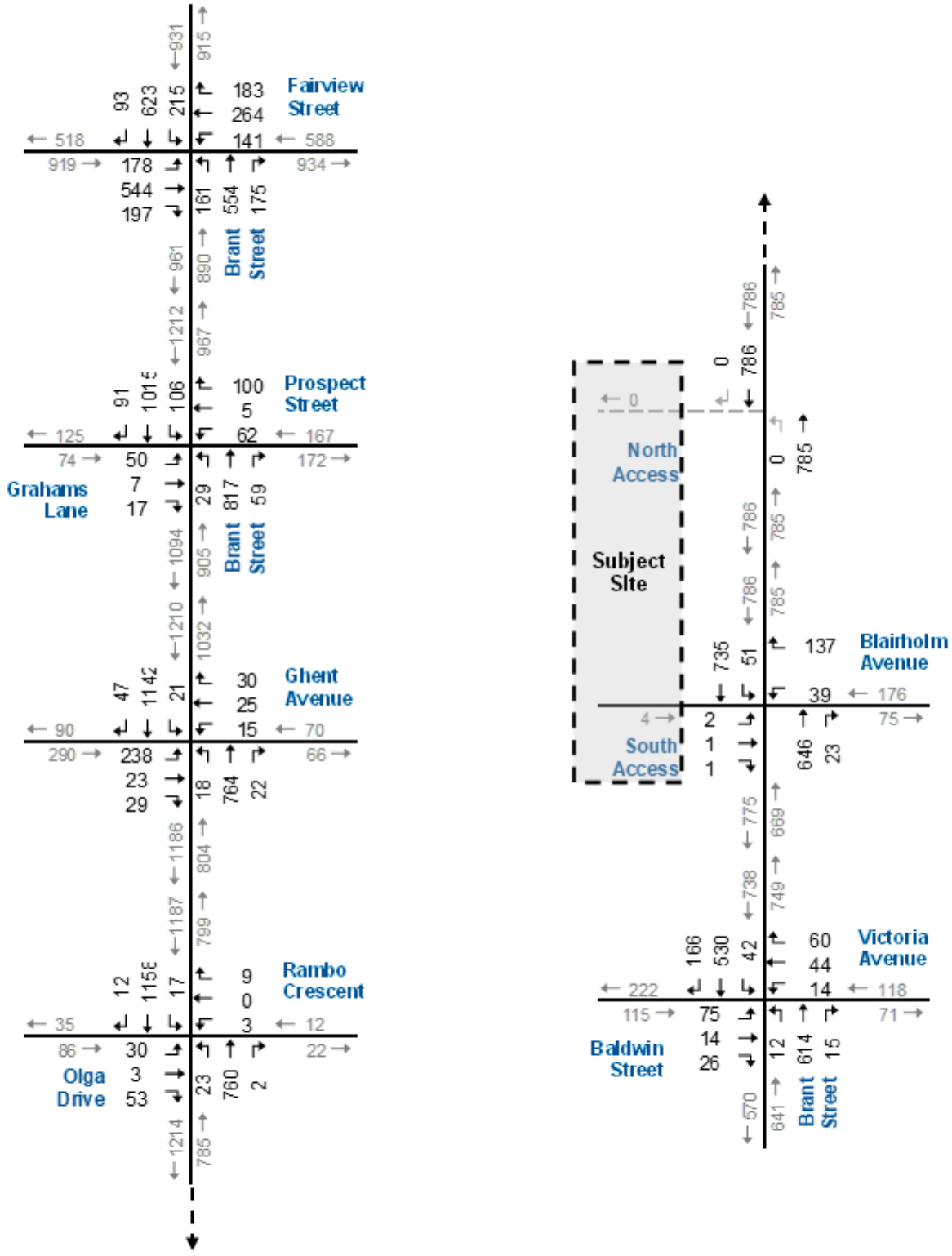
4.1.3 Background Traffic Volumes

The background traffic volumes within the study area are estimated to consist of generalized background traffic growth of 2.0% per annum along with traffic related to the nearby developments. **Figure 4.2a** and **Figure 4.2b** illustrate the background traffic forecasts for the AM and PM peak hours, respectively.

4.1.4 Total Traffic Volumes

The total traffic volumes within the study area are estimated to consist of generalized background traffic growth of 2.0% per annum, traffic related to the nearby developments and development site-generated traffic. **Figure 4.3a** and **Figure 4.3b** illustrate the total traffic forecasts for the AM and PM peak hours, respectively.

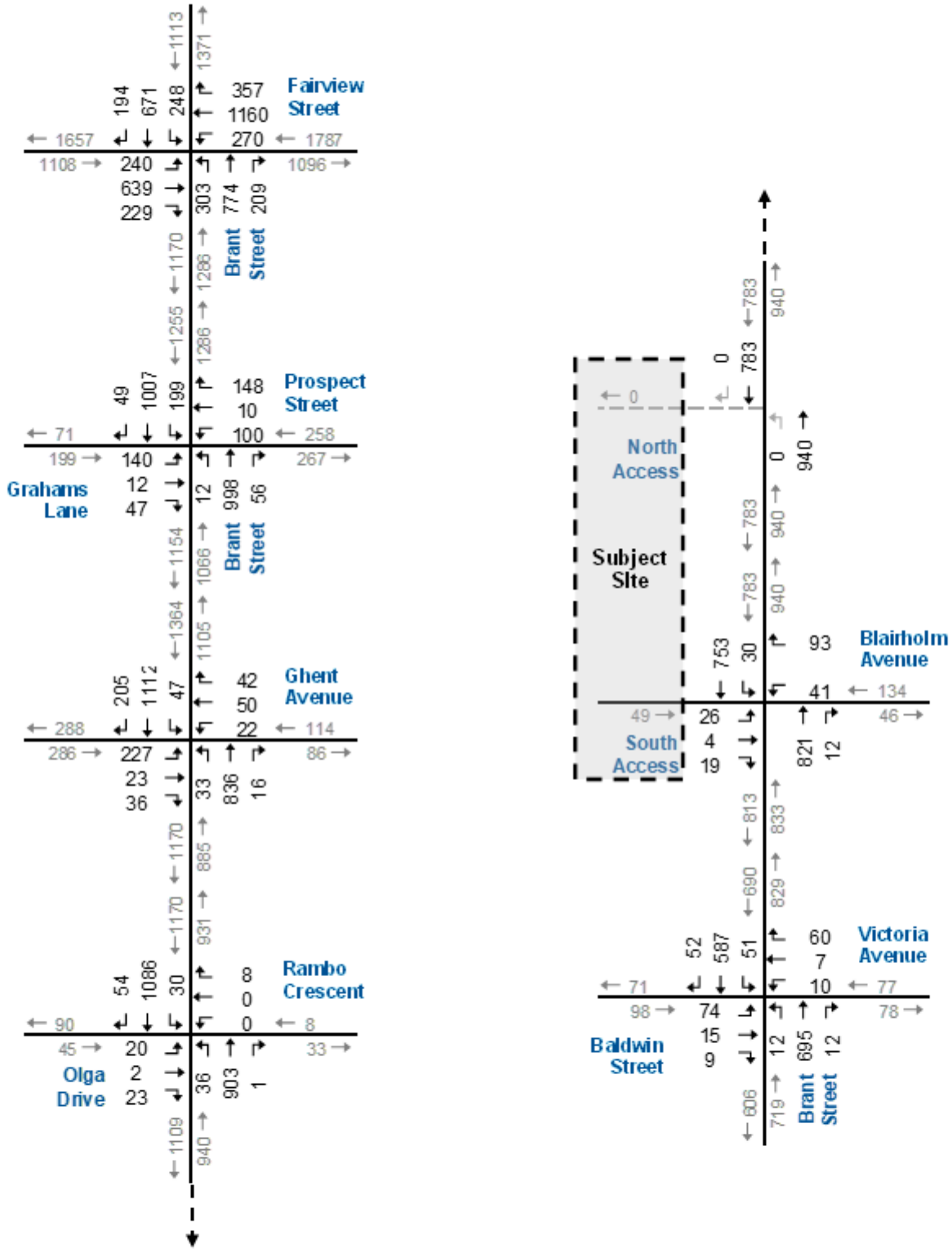
It should be noted that analysis of Future Total conditions is based on a previous site concept plan which included additional residential units and thus a slightly higher trip generation estimate. As such, the analysis provides a conservative estimate of site generated traffic and the impacts on the study area network.



Future Background Traffic Volumes
AM Peak Hour

688 Brant Street, Burlington
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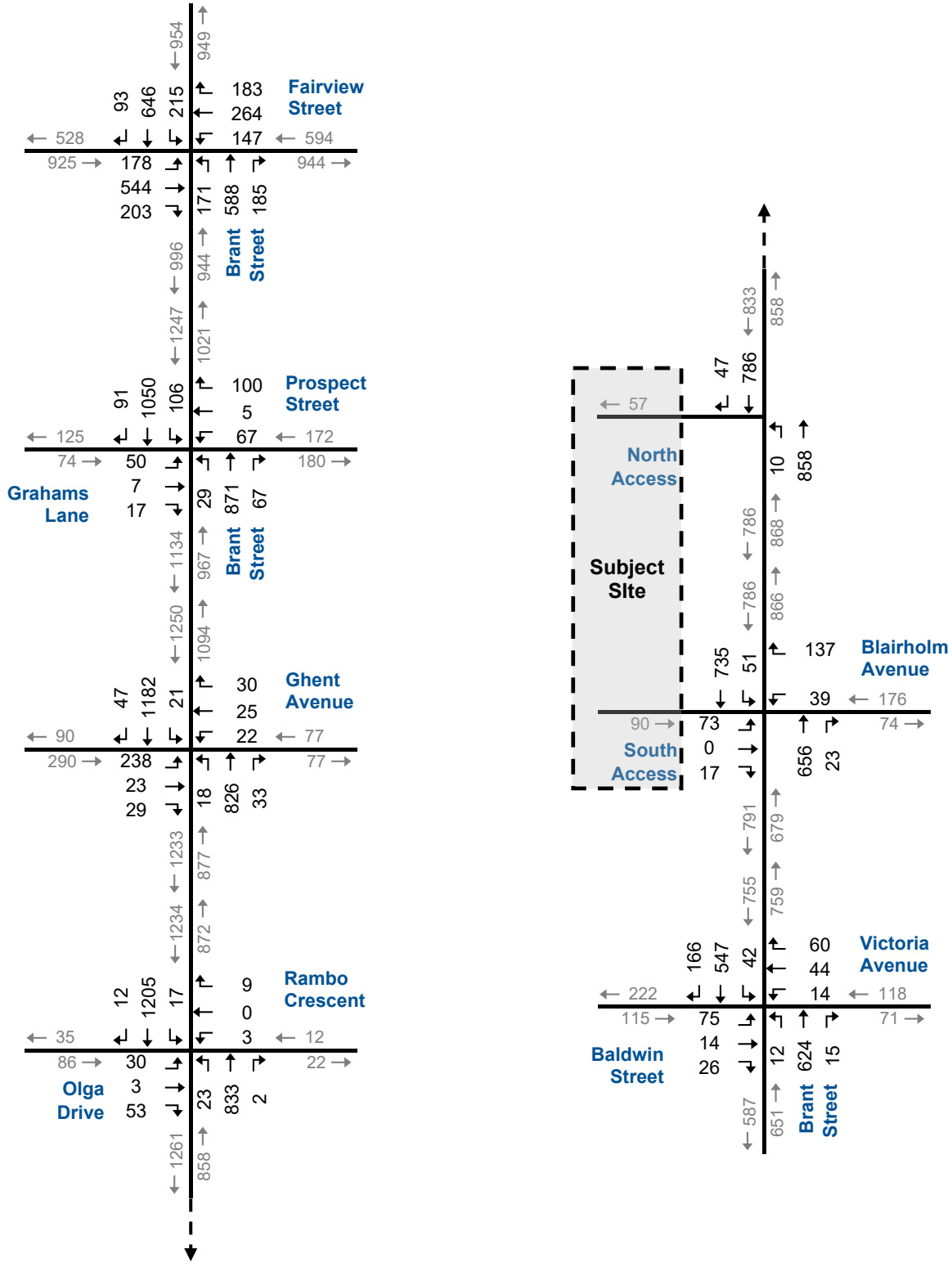
Figure 4.2a



Future Background Traffic Volumes
PM Peak Hour

688 Brant Street, Burlington
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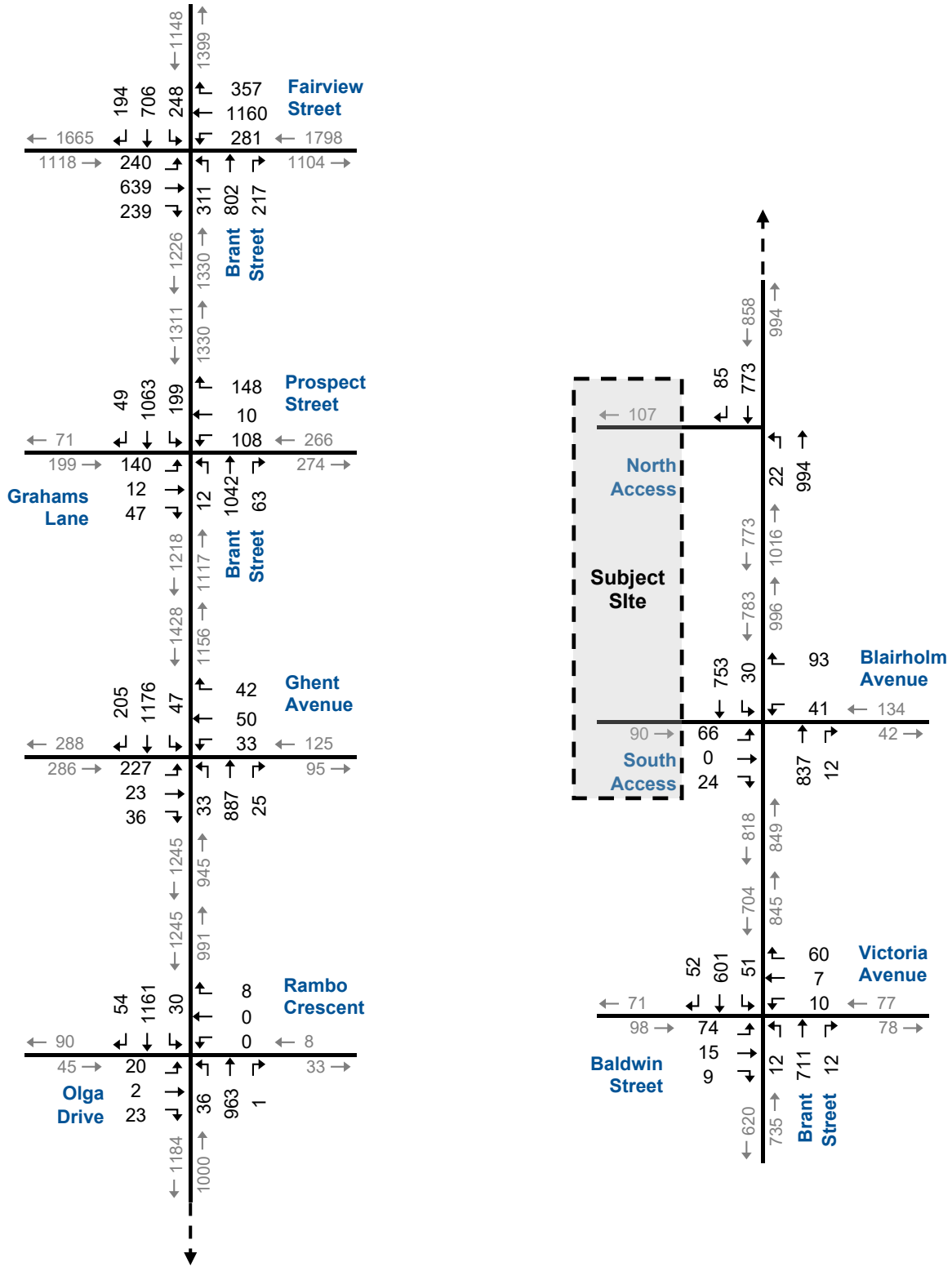
Figure 4.2b



Future Total Traffic Volumes AM Peak Hour

688 Brant Street, Burlington
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Figure 4.3a



Future Total Traffic Volumes
PM Peak Hour

688 Brant Street, Burlington
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Figure 4.3b

4.2 Background Traffic Operations

Level of service analyses have been conducted using Synchro 11 for the weekday AM and PM peak hour conditions at the study area intersections utilizing background traffic forecasts. The intersections within the study area were assessed based on the same parameters as in the analysis of existing conditions. Signal timings were not optimized.

Table 4.2 and **Table 4.3** summarize the results of the background traffic operations for the AM and PM peak hours, respectively. The study area intersections are forecast to operate with acceptable levels of service, except for the following movements:

Fairview Street and Brant Street

- The eastbound left-turn movement is forecast to operate with delays in the LOS F range with a v/c ratio above 1.00 during the PM peak hour.
- The westbound through movement is forecast to operate with delays in the LOS D range with a v/c ratio above 0.95 during the PM peak hour.
- The northbound left-turn lane is forecast to operate with delays in the LOS D range with a v/c ratio above 0.95 during the PM peak hour. The 95th percentile queue length is forecast to extend beyond the available storage during the PM peak hour.
- The northbound through movement is forecast to operate with delays in the LOS D range with a v/c ratio above 0.85 during the PM peak hour.
- The southbound left-turn lane is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the PM peak hour.

Prospect Street/Grahams Lane and Brant Street

- The eastbound left-turn lane is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the PM peak hour.
- The westbound left-turn lane is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the AM and PM peak hours.

Olga Drive/Rambo Crescent and Brant Street

- The eastbound approach is forecast to operate with delays in the LOS F range during the AM and PM peak hours.
- The westbound approach is forecast to operate with delays in the LOS F range during the AM peak hour.

Blairholm Avenue and Brant Street

- The westbound approach queue length is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the AM and PM peak hours.

Victoria Avenue/Baldwin Street and Brant Street

- The eastbound left-turn queue length is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the AM and PM peak hours.

Appendix H contains the detailed Synchro reports.

Localized congestion is forecast at study area intersections. Operations at the Fairview Street and Brant Street intersection are forecast to degrade with background traffic growth, resulting in multiple movements operating at critical levels. In addition, background traffic growth along Brant Street results in eastbound/westbound traffic from Olga Drive/Rambo Crescent operating with delays in the LOS F range particularly during the AM peak hour. Though traffic on Olga Drive/Rambo Crescent is not forecast to grow significantly, the delays are expected to grow due to increases in north/south traffic leaving less gaps for the stop-controlled eastbound/westbound movements.

TABLE 4.2: BACKGROUND TRAFFIC OPERATIONS – AM PEAK HOUR

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Fairview Street & Brant Street	TCS	LOS	C	D	C	**D**	D	D	D	**D**	B	C	C	**C**	B	C	C	**C**	**C**
			Delay	28	44	34	**39**	44	41	38	**41**	18	26	22	**24**	16	25	20	**22**	**31**
			V/C	0.49	0.75	0.14		0.70	0.48	0.13		0.44	0.44	0.13		0.54	0.47	0.07		**0.63**
			Q	45	80	18		36	43	19		34	83	17		46	87	4		
			Ex	--	--	190		75	--	--		85	--	80		55	--	90		
			Avail.	--	--	172		39	--	--		51	--			9	--			
	2 - Prospect Street/Grahams Lane & Brant Street	TCS	LOS	D	D	>	**D**	D	D	>	**D**	A	A	>	**A**	A	B	>	**B**	**B**
			Delay	39	36	>	**38**	39	36	>	**37**	6	6	>	**6**	5	12	>	**11**	**12**
			V/C	0.41	0.05	>		0.45	0.10	>		0.16	0.46	>		0.28	0.58	>		**0.53**
			Q	21	9	>		24	16	>		5	42	>		10	96	>		
			Ex	40	--	>		20	--	>		20	--	>		20	--	>		
			Avail.	20	--	>		-4	--	>		15	--	>		11	--	>		
	3 - Ghent Avenue & Brant Street	TCS	LOS	<	D	C	**D**	<	C	>	**C**	A	B	>	**B**	A	A	>	**A**	**B**
			Delay	<	41	25	**40**	<	25	>	**25**	10	12	>	**12**	3	9	>	**8**	**14**
			V/C	<	0.78	0.02		<	0.12	>		0.10	0.40	>		0.06	0.60	>		**0.66**
			Q	<	65	4		<	14	>		5	53	>		2	127	>		
			Ex	<	--	25		<	--	>		45	--	>		30	--	>		
			Avail.	<	--	22		<	--	>		40	--	>		28	--	>		
	4 - Olga Drive/Rambo Crescent & Brant Street	TWSC	LOS	<	F	>	**F**	<	F	>	**F**	A	A	>	**A**	A	A	>	**A**	
			Delay	<	246	>	**246**	<	Err	>	**Err**	0	0	>	**1**	10	0	>	**0**	
			V/C	<	1.17	>		<	3.41	>		0.32	0.16	>		0.02	0.75	>		
			Q	<	55	>		<	Err	>		0	0	>		1	0	>		
			Ex	<	--	>		<	--	>		20	--	>		15	--	>		
			Avail.	<	--	>		<	--	>		20	--	>		14	--	>		
	5 - Blairholm Avenue/South Access & Brant Street	TCS	LOS	<	D	D	**D**	D		D	**D**		A	>	**A**	A	B		**B**	**B**
			Delay	<	36	36	**36**	39		37	**38**		4	>	**4**	5	12		**12**	**12**
			V/C	<	0.03	0.00		0.37		0.25			0.33	>		0.13	0.67			**0.63**
			Q	<	3	0		17		19			39	>		9	111			
			Ex	<	--	--		15		--			--	>		15	--			
			Avail.	<	--	--		-2		--			--	>		6	--			
	6 - Baldwin Street/Victoria Avenue & Brant Street	TCS	LOS	D	C	>	**D**	C	D	>	**D**	A	A	>	**A**	A	A	A	**A**	**A**
			Delay	40	34	>	**38**	34	36	>	**35**	4	7	>	**7**	2	4	4	**4**	**10**
			V/C	0.54	0.09	>		0.10	0.28	>		0.02	0.50	>		0.10	0.43	0.12		**0.50**
			Q	27	11	>		8	22	>		3	83	>		3	58	5		
			Ex	15	--	>		40	--	>		15	--	>		45	--	50		
			Avail.	-12	--	>		32	--	>		12	--	>		42	--	46		
	7 - North Access & Brant Street	TWSC	LOS									A	A		**A**		A	>	**A**	
			Delay									0	0		**0**		0	>	**0**	
			V/C									0.00	0.25				0.50	>		
			Q									0	0				0	>		
			Ex									15	--				--	>		
			Avail.										--				--	>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control
RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

TABLE 4.3: BACKGROUND TRAFFIC OPERATIONS – PM PEAK HOUR

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Fairview Street & Brant Street	TCS	LOS	F	D	C	**E**	C	D	C	**D**	D	D	D	**D**	D	D	D	**D**	**D**
			Delay	177	37	31	**66**	32	54	29	**45**	54	53	35	**50**	50	48	36	**47**	**51**
			V/C	1.25	0.63	0.15		0.77	0.95	0.33		0.91	0.86	0.15		0.85	0.77	0.15		**1.05**
			Q	112	96	19		63	198	38		105	138	20		84	108	21		
			Ex	--	--	190		75	--	--		85	--	80		55	--	90		
			Avail.	--	--	171		12	--	--		-20	--			-29	--			
	2 - Prospect Street/Grahams Lane & Brant Street	TCS	LOS	E	C	>	**D**	D	C	>	**C**	A	A	>	**A**	B	B	>	**B**	**B**
			Delay	58	32	>	**51**	36	33	>	**34**	5	8	>	**8**	10	14	>	**13**	**16**
			V/C	0.81	0.08	>		0.49	0.14	>		0.06	0.57	>		0.58	0.57	>		**0.63**
			Q	56	13	>		34	19	>		1	35	>		18	88	>		
			Ex	40	--	>		20	--	>		20	--	>		20	--	>		
			Avail.	-16	--	>		-14	--	>		19	--	>		2	--	>		
	3 - Ghent Avenue & Brant Street	TCS	LOS	<	D	C	**D**	<	C	>	**C**	B	A	>	**A**	A	A	>	**A**	**B**
			Delay	<	38	24	**36**	<	26	>	**26**	13	9	>	**9**	7	10	>	**10**	**13**
			V/C	<	0.74	0.02		<	0.22	>		0.28	0.45	>		0.19	0.71	>		**0.72**
			Q	<	63	5		<	22	>		10	93	>		6	52	>		
			Ex	<	--	25		<	--	>		45	--	>		30	--	>		
			Avail.	<	--	20		<	--	>		35	--	>		24	--	>		
	4 - Olga Drive/Rambo Crescent & Brant Street	TWSC	LOS	<	F	>	**F**	<	B	>	**B**	A	A	>	**A**	B	A	>	**A**	
			Delay	<	60	>	**60**	<	12	>	**12**	0	0	>	**1**	10	0	>	**0**	
			V/C	<	0.44	>		<	0.02	>		0.39	0.19	>		0.05	0.73	>		
			Q	<	15	>		<	0	>		0	0	>		1	0	>		
			Ex	<	--	>		<	--	>		20	--	>		15	--	>		
			Avail.	<	--	>		<	--	>		20	--	>		14	--	>		
	5 - Blairholm Avenue/South Access & Brant Street	TCS	LOS	<	D	D	**D**	D		D	**D**		A	>	**A**	A	B		**B**	**B**
			Delay	<	39	38	**39**	41		38	**39**		5	>	**5**	6	11		**11**	**11**
			V/C	<	0.21	0.01		0.39		0.07			0.33	>		0.07	0.56			**0.54**
			Q	<	13	2		17		14			41	>		5	141			
			Ex	<	--	--		15		--			--	>		15	--			
			Avail.	<	--	--		-2		--			--	>		10	--			
	6 - Baldwin Street/Victoria Avenue & Brant Street	TCS	LOS	D	D	>	**D**	D	D	>	**D**	A	A	>	**A**	A	A	A	**A**	**A**
			Delay	44	36	>	**42**	36	36	>	**36**	3	7	>	**7**	5	6	7	**6**	**10**
			V/C	0.58	0.09	>		0.09	0.09	>		0.02	0.58	>		0.14	0.49	0.04		**0.58**
			Q	27	10	>		6	13	>		2	102	>		10	107	6		
			Ex	15	--	>		40	--	>		15	--	>		45	--	50		
			Avail.	-12	--	>		34	--	>		13	--	>		35	--	44		
	7 - North Access & Brant Street	TWSC	LOS									A	A		**A**		A	>	**A**	
			Delay									0	0		**0**		0	>	**0**	
			V/C									0.00	0.30				0.50	>		
			Q									0	0				0	>		
			Ex									15	--				--	>		
			Avail.										--				--	>		

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LOS - Level of Service
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Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage
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TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control
RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

4.3 Total Traffic Operations

Level of service analyses have been conducted using Synchro 11 for the weekday AM and PM peak hour conditions at the study area intersections utilizing total traffic forecasts. The intersections within the study area were assessed based on the same parameters as in the analysis of background condition. Signal timings were not optimized.

Table 4.4 and **Table 4.5** summarize the results of the total traffic operations for the AM and PM peak hours, respectively. The study area intersections are forecast to operate with acceptable levels of service, except for the following movements:

Fairview Street and Brant Street

- The eastbound left-turn movement is forecast to operate with delays in the LOS F range with a v/c ratio above 1.00 during the PM peak hour.
- The westbound through movement is forecast to operate with delays in the LOS D range with a v/c ratio above 0.95 during the PM peak hour.
- The northbound left-turn lane is forecast to operate with delays in the LOS E range with a v/c ratio above 0.95 during the PM peak hour. The 95th percentile queue length is forecast to extend beyond the available storage during the PM peak hour.
- The northbound through movement is forecast to operate with delays in the LOS E range with a v/c ratio above 0.85 during the PM peak hour.
- The southbound left-turn lane is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the PM peak hour.

Prospect Street/Grahams Lane and Brant Street

- The eastbound left-turn lane is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the PM peak hour.
- The westbound left-turn lane is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the AM and PM peak hours.
- The southbound left-turn lane is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the PM peak hour.

Olga Drive/Rambo Crescent and Brant Street

- The eastbound approach is forecast to operate with delays in the LOS F range during the AM and PM peak hours.
- The westbound approach is forecast to operate with delays in the LOS F range during the AM peak hour.

Blairholm Avenue and Brant Street

- The westbound approach queue length is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the AM and PM peak hours.

Victoria Avenue/Baldwin Street and Brant Street

- The eastbound left-turn queue length is forecast to operate with 95th percentile queue lengths extending beyond the available storage during the AM and PM peak hours.

Appendix I contains the detailed Synchro reports.

Similar to background traffic operations, localized congestion is forecast at study area intersections. Operations at the Fairview Street and Brant Street intersection are forecast to degrade with background traffic growth, resulting in multiple movements operating at critical levels. In addition, background traffic growth along Brant Street results in eastbound/westbound traffic from Olga Drive/Rambo Crescent to operate with delays in the LOS F range particularly during the AM peak hour. Though traffic on Olga Drive/Rambo Crescent is not forecast to grow significantly, the delays are expected to grow due to increases in north/south traffic leaving less gaps for the stop-controlled eastbound/westbound movements.

The redevelopment of the subject site is anticipated to have a negligible effect on traffic operations within the study area. Individual movement delays are expected to increase by less than 20 seconds during the AM and PM peak hours as a result of the site traffic. The exception to this being Olga Drive/Rambo Crescent where the critical eastbound/westbound delays are increased further due to the increase in traffic along Brant Street.

The south driveway is forecast to operate with delays in the LOS D range and are not forecast to exceed 45 seconds during the AM and PM peak hours. The inbound movements to the north access are forecast to operate with delays in the LOS B range are not expected to exceed 15 seconds during the AM and PM peak hours.

TABLE 4.4: TOTAL TRAFFIC OPERATIONS – AM PEAK HOUR

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Fairview Street & Brant Street	TCS	LOS	C	D	C	D	D	D	D	D	B	C	C	C	B	C	C	C	C
			Delay	28	43	34	38	46	41	38	41	18	27	23	25	17	26	20	23	31
			V/C	0.49	0.75	0.15		0.73	0.48	0.13		0.48	0.48	0.13		0.55	0.49	0.07		0.64
			Q	45	80	18		39	43	19		36	88	18		46	91	4		
			Ex	--	--	190		75	--	--		85	--	80		55	--	90		
			Avail.	--	--	172		36	--	--		49	--			9	--			
	2 - Prospect Street/Grahams Lane & Brant Street	TCS	LOS	D	D	>	D	D	D	>	D	A	A	>	A	A	B	>	B	B
			Delay	39	35	>	38	39	36	>	37	7	6	>	6	6	12	>	11	12
			V/C	0.40	0.05	>		0.47	0.10	>		0.18	0.50	>		0.30	0.60	>		0.55
			Q	20	8	>		25	15	>		5	54	>		10	102	>		
			Ex	40	--	>		20	--	>		20	--	>		20	--	>		
			Avail.	20	--	>		-5	--	>		15	--	>		10	--	>		
	3 - Ghent Avenue & Brant Street	TCS	LOS	<	D	C	D	<	C	>	C	A	B	>	B	A	A	>	A	B
			Delay	<	41	24	39	<	25	>	25	10	12	>	12	3	9	>	9	14
			V/C	<	0.78	0.02		<	0.15	>		0.11	0.44	>		0.07	0.62	>		0.67
			Q	<	65	4		<	16	>		5	52	>		1	134	>		
			Ex	<	--	25		<	--	>		45	--	>		30	--	>		
			Avail.	<	--	22		<	--	>		40	--	>		29	--	>		
	4 - Olga Drive/Rambo Crescent & Brant Street	TWSC	LOS	<	F	>	F	<	F	>	F	A	A	>	A	B	A	>	A	
			Delay	<	361	>	361	<	Err	>	Err	0	0	>	1	10	0	>	0	
			V/C	<	1.42	>		<	9.19	>		0.36	0.18	>		0.03	0.78	>		
			Q	<	63	>		<	Err	>		0	0	>		1	0	>		
			Ex	<	--	>		<	--	>		20	--	>		15	--	>		
			Avail.	<	--	>		<	--	>		20	--	>		14	--	>		
	5 - Blairholm Avenue/South Access & Brant Street	TCS	LOS	<	D	C	D	C		C	C		A	>	A	A	B		B	B
			Delay	<	43	32	41	34		33	33		6	>	6	7	14		13	14
			V/C	<	0.62	0.02		0.27		0.22			0.36	>		0.15	0.72			0.70
			Q	<	27	2		15		18			50	>		10	116			
			Ex	<	--	--		15		--			--	>		15	--			
			Avail.	<	--	--		0		--			--	>		5	--			
	6 - Baldwin Street/Victoria Avenue & Brant Street	TCS	LOS	D	C	>	D	C	D	>	D	A	A	>	A	A	A	A	A	A
			Delay	40	34	>	38	34	36	>	35	4	7	>	7	1	2	1	2	9
			V/C	0.54	0.09	>		0.10	0.28	>		0.02	0.51	>		0.10	0.44	0.12		0.51
			Q	27	11	>		8	22	>		3	86	>		1	13	0		
			Ex	15	--	>		40	--	>		15	--	>		45	--	50		
			Avail.	-12	--	>		32	--	>		12	--	>		45	--	50		
	7 - North Access & Brant Street	TWSC	LOS									B	A		A		A	>	A	
			Delay									11	0		0		0	>	0	
			V/C									0.02	0.28				0.53	>		
			Q									1	0				0	>		
			Ex									15	--				--	>		
			Avail.										--				--	>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length
Ex. - Existing Available Storage
Avail. - Available Storage

TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

TABLE 4.5: TOTAL TRAFFIC OPERATIONS – PM PEAK HOUR

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Fairview Street & Brant Street	TCS	LOS	F	D	C	**E**	C	D	C	**D**	E	E	D	**E**	D	D	D	**D**	**D**
			Delay	177	38	31	**66**	35	54	29	**46**	70	56	35	**56**	50	52	37	**49**	**53**
			V/C	1.25	0.63	0.16		0.80	0.95	0.33		0.96	0.89	0.16		0.85	0.83	0.16		**1.08**
			Q	112	96	19		70	198	38		121	147	20		84	115	22		
			Ex	--	--	190		75	--	--		85	--	80		55	--	90		
			Avail.	--	--	171		6	--	--		-36	--			-29	--			
	2 - Prospect Street/Grahams Lane & Brant Street	TCS	LOS	E	C	>	**D**	D	C	>	**C**	A	A	>	**A**	B	B	>	**B**	**B**
			Delay	58	32	>	**51**	37	33	>	**34**	5	8	>	**8**	12	15	>	**14**	**16**
			V/C	0.81	0.08	>		0.53	0.14	>		0.07	0.60	>		0.61	0.60	>		**0.65**
			Q	56	13	>		36	19	>		1	36	>		21	96	>		
			Ex	40	--	>		20	--	>		20	--	>		20	--	>		
			Avail.	-16	--	>		-16	--	>		19	--	>		-1	--	>		
	3 - Ghent Avenue & Brant Street	TCS	LOS	<	D	C	**D**	<	C	>	**C**	B	A	>	**A**	A	A	>	**A**	**B**
			Delay	<	41	24	**39**	<	27	>	**27**	16	10	>	**10**	8	10	>	**10**	**14**
			V/C	<	0.78	0.02		<	0.29	>		0.32	0.48	>		0.21	0.74	>		**0.75**
			Q	<	65	5		<	26	>		11	102	>		6	174	>		
			Ex	<	--	25		<	--	>		45	--	>		30	--	>		
			Avail.	<	--	20		<	--	>		34	--	>		25	--	>		
	4 - Olga Drive/Rambo Crescent & Brant Street	TWSC	LOS	<	F	>	**F**	<	B	>	**B**	A	A	>	**A**	B	A	>	**A**	
			Delay	<	95	>	**95**	<	12	>	**12**	0	0	>	**1**	11	0	>	**0**	
			V/C	<	0.58	>		<	0.02	>		0.41	0.21	>		0.05	0.78	>		
			Q	<	21	>		<	0	>		0	0	>		1	0	>		
			Ex	<	--	>		<	--	>		20	--	>		15	--	>		
			Avail.	<	--	>		<	--	>		20	--	>		14	--	>		
	5 - Blairholm Avenue/South Access & Brant Street	TCS	LOS	<	D	D	**D**	D		D	**D**		A	>	**A**	A	B		**B**	**B**
			Delay	<	41	37	**40**	41		38	**38**		5	>	**5**	6	11		**11**	**12**
			V/C	<	0.49	0.02		0.38		0.07			0.33	>		0.07	0.56			**0.55**
			Q	<	26	4		17		14			45	>		5	139			
			Ex	<	--	--		15		--			--	>		15	--			
			Avail.	<	--	--		-2		--			--	>		10	--			
	6 - Baldwin Street/Victoria Avenue & Brant Street	TCS	LOS	D	D	>	**D**	D	D	>	**D**	A	A	>	**A**	A	A	A	**A**	**B**
			Delay	44	36	>	**42**	36	36	>	**36**	3	7	>	**7**	5	7	7	**7**	**10**
			V/C	0.58	0.09	>		0.09	0.09	>		0.02	0.59	>		0.15	0.50	0.04		**0.59**
			Q	27	10	>		6	13	>		2	107	>		10	123	6		
			Ex	15	--	>		40	--	>		15	--	>		45	--	50		
			Avail.	-12	--	>		34	--	>		13	--	>		35	--	44		
	7 - North Access & Brant Street	TWSC	LOS									B	A		**A**		A	>	**A**	
			Delay									11	0		**0**		0	>	**0**	
			V/C									0.04	0.32				0.55	>		
			Q									1	0				0	>		
			Ex									15	--				--	>		
			Avail.										--				--	>		

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Ex. - Existing Available Storage
Avail. - Available Storage

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AWSC - All-Way Stop Control

RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

5 Remedial Measures

5.1 Assessment of Impacts

Based on the analyses, minimal delay and congestion is forecast to occur at the intersections assessed within the study area. A summary of the findings at each intersection is further discussed.

5.1.1 Fairview Street and Brant Street

The intersection of Brant Street and Fairview Street is experiencing capacity constraints under existing conditions. The capacity constraints are expected to continue to occur with the expected growth in non-site generated traffic.

To mitigate the increases to the delay and capacity, optimizing the signal timings to provide additional green time for these movements should be considered.

It is recommended that the road authority monitor and adjust signal timings along the Brant Street and Fairview Street corridors as traffic volumes increase.

5.1.2 Prospect Street/Grahams Lane and Brant Street

The operation analysis suggests queuing issues may occur for the eastbound and westbound left-turn movements. The queue issues occur in the base year and are forecast to occur under background and total traffic conditions.

To accommodate the 95th percentile queue length for the eastbound and westbound left-turn movement, approximately 20 metres of additional storage is needed. An adjustment to the existing pavement marking would resolve this issue.

However, it should be noted that the average queue length is forecast to be less than 30 metres for the eastbound direction and 20 metres for the westbound direction and can be accommodated by the existing storage without issue.

It is recommended that the road authority monitor and adjust signal timings along the Brant Street corridors as traffic volumes increase.

5.1.3 Ghent Avenue and Brant Street

Under the existing traffic scenario, the intersection currently operates at LOS D or better for all movements. With general background growth

and in-stream developments, traffic operations are forecast to be at similar levels to existing. No change in level of service is anticipated as a result of the proposed redevelopment.

5.1.4 Olga Drive/Rambo Crescent and Brant Street

Under the existing traffic scenario, the eastbound movement operates at LOS F during the AM peak hour. With general background growth and in-stream developments, traffic operations are expected to degrade with the eastbound movement forecast to operate at LOS F during the PM peak hour and the westbound movement operating at LOS F during the AM peak hour.

A signal could improve traffic operations; however, it is not warranted or recommended based on the intersection spacing. **Appendix J** contains the MTO signal warrant.

It is likely that with increasing delays, neighbourhood traffic will gradually divert to Blairholm Avenue and Ghent Avenue for signalized intersections.

5.1.5 Blairholm Avenue/South Access and Brant Street

The operation analysis suggests minor queuing issues may occur for the westbound left-turn movements. The 95th percentile queue issues are forecast to occur under background traffic conditions. However, the excess queue is predicted to extend less than one car length beyond the available storage and can be accommodated within the taper length. In addition, the average queue length is forecast to be less than 10 metres and can be adjusted by the existing storage without issue.

The addition of site traffic is expected to increase eastbound delays by less than 10 seconds.

The road authorities should monitor the future traffic volumes at this intersection and optimize the signal timings where possible.

5.1.6 Baldwin Street/Victoria Avenue and Brant Street

Under the existing traffic scenario, the intersection currently operates at LOS D or better for all movements and v/c ratios well under capacity. With general background growth and in-stream developments, the intersection is forecast to operate with similar levels of service to the existing conditions. Eastbound left-turn queue length is predicted to extend beyond the available storage during the AM and PM peak hours. To accommodate the 95th percentile queue length for the eastbound left-turn movement, approximately 15 metres of additional storage is needed. However, the average queue length is

forecast to be less than 15 metres and can be accommodated by the existing storage without issue.

No level of service change is anticipated due to the proposed redevelopment.

5.1.7 North Access and Brant Street

Under the total traffic scenario, the intersection currently operates at LOS B or better for all movements and v/c ratios well under capacity.

The addition of the site traffic adds less than 15 seconds of delay during the AM and PM peak hours.

6 Parking Methodology

6.1 Zoning By-Law Requirements

6.1.1 Vehicle Parking

Zoning By-law 2020 is the current in-force By-law for the City of Burlington. Based on the City Zoning By-law, the subject site is within the "Mixed-Use Commercial" zone. In the City's OP, the subject site is located within the Urban Growth Centre boundary and is identified as a Primary Growth Area. The minimum parking rates for the proposed development are as follows:

- Apartment Dwelling Units:
  - 1.25 spaces per unit for apartment dwellings inclusive of visitors regardless of the number of bedrooms
- Retail:
  - 3.5 spaces per 100 m^2 GFA

Note that the "Townhouse" units are serviced by the main building through common corridors, elevators, and parking. As such, the "Townhouse" units can be considered as apartment units and share the 1.25 spaces per unit rate designated for apartment dwelling units.

Table 6.1 summarizes minimum parking standard calculations for the development.

TABLE 6.1: ZONING REQUIREMENTS

Land Use	Units	Rate	Spaces Required
Residential - Apartment	305 units	1.25 spaces per unit*	381.3
Retail Store	1,592 m^2	3.5 spaces per 100 m^2 GFA	55.7
Total Residential			**382.0**
Total Retail			**56.0**
Total Parking Required			**438**

As indicated in **Table 6.1**, the proposed development requires 438 parking spaces under the City's Zoning By-Law. The development proposes a parking supply of 435 spaces (435 spaces plus 27 tandem spaces): 379 residential spaces (1.24 spaces per unit) and 56 retail spaces (3.5 spaces per 100 m^2 GFA). The proposed parking supply is 3 spaces less than the Zoning By-Law requirement.

6.1.2 Burlington City-Wide Parking Standards Review

In 2017, the city retained IBI Group to undertake a Burlington City-Wide Parking Standards Review (CWPSR). The primary goal of this study is to review the "Parking Requirements" contained within By-law 2020 and to provide detailed recommendations on how they should be modified to reflect better the transportation and land use realities and objectives across Burlington.

A comprehensive approach to determining the recommended parking rates involved assessing existing standards in Burlington and other jurisdictions, conducting parking surveys, estimating parking demand directly from first principles, and considering policy objectives. **Table 6.2** summarises the recommended parking ratios for apartment units in an Intensification Area as contained in the CWPSR.

TABLE 6.2: CWPSR INTENSIFICATION PARKING – APARTMENT

Assignment	Parking Ratio (spaces/unit)	
	Min.	Max.
Resident	1.00	1.50
Visitor	0.25	0.25

The Planning and Development Committee of Burlington Council approved revising the parking rates at a statutory public meeting on September 17, 2019, and Council approved the rates outlined in Table 6.2 on September 23, 2019, as contained within Zoning By-law Amendment (2020-414).

An appeal to the Local Planning Appeal Tribunal (LPAT) of the passing of By-law 2020.414, which amends Zoning By-law 2020 for updating the parking rates for residential land use, was made on October 16, 2019. The residential parking rates contained in the Zoning By-law 2020 Amendment are based on the parking rates recommended in the CWPSR.

The LPAT decision regarding the City of Burlington's Zoning By-law Amendment accepted the following:

"For those lands within a 'Primary Growth Area' as identified in the City's new Official Plan approved November 30, 2020, a minimum parking rate of 1.25 spaces per unit for apartment dwellings inclusive of visitors regardless of the number of bedrooms. This rate is to be identified as interim and subject to further study. Further, any application to reduce the parking rate below a rate of 1.25 spaces per unit for apartment dwellings inclusive of visitors will be required to be supported by a parking justification study that is acceptable to the city."

Per the Zoning By-law Amendment, a requirement confirmed in the LPAT decision, a critique of the CWPSR methodology is noted below. As the CWPSR formed the basis for the rates contained in the Zoning By-Law Amendment 2020.414, the critique establishes flaws in the method to establish the updated parking rates:

- As part of undertaking the CWPSR, spot surveys were completed. The survey data observed a maximum parking demand of 1.10 spaces per unit, with a maximum visitor demand of 0.10 spaces per unit at apartment sites in Burlington. There is no rationale, methodology or justification for why a visitor parking requirement of 0.25 spaces per unit is recommended for intensification areas, more than double the observed maximum rate.

- The CWPSR is largely dismissive of the negative impacts that parking requirements have. While the CWPSR recognizes the adverse effects of parking minimums and the Ontario Climate Change Plan prescribes the removal of parking minimums from all municipal by-laws, the recommendations viewed parking minimums as necessary for the foreseeable future. This dismissal runs counter to the literature reviewed as part of the CWPSR, which found that parking minimums have significant negative impacts and that several policy alternatives are available.

- The CWPSR suggests that there is little risk in reducing minimum residential parking requirements as the availability of parking is a key decision in an individual's residential choice. Developers are well attuned to their potential customers' parking needs and will not reduce parking provisions so much as to compromise the marketability of their development. It stands to reason that the economic demand for parking would create self-enforced minimums and that the report could have also suggested eliminating minimums.

- The CWPSR identified shared parking as a viable tool that encourages more efficient use of the parking supply. However, the CWPSR fails to further expand on the "macro" scale, recognizing that shared parking can extend beyond a specific site and include several developments. Specifically, parking can be shared among buildings and facilities in an area to take advantage of public parking facilities during peak periods. This arrangement is not new, particularly for the City of Burlington, which has employed a shared parking strategy. As City Hall does not provide on-site parking for employees, the city has been using a shared parking arrangement by virtue of the

municipal parking lots near City Hall. These municipal parking spaces are efficiently shared since peak parking demands of City Hall employees occur during weekdays, while restaurants and visitors to the Downtown peak parking demands would occur during evenings and weekends.

- The CWPSR did not deviate from the status quo of parking policy within intensification areas, despite recognizing the negative impacts associated with parking provisions. Given this report created the scope for future parking requirement studies, adhering to the status quo of still requiring 1.25 spaces per unit in Intensification Areas limits opportunities for change and, more importantly, deviates from Provincial, Regional and Municipal planning policy, including Ontario's Climate Action Plan.
- A final critique of the CWPSR methodology is that it failed to study auto ownership trends to determine how parking demand has changed over time and will continue to change. As the literature review suggested, auto ownership is decreasing within the general population, and the decrease is even more pronounced with younger generations. By basing parking requirements on existing auto-ownership rates, this exercise fails to create the space for reduced parking requirements that reflect changing mobility trends and policy goals. The proposed minimum parking requirements are based on providing at least enough parking to meet existing auto-ownership rates; they do not reflect changing mobility trends or policies that encourage a shift away from automobile-based travel.

6.2 Residential Parking Supply

6.2.1 Institute of Transportation Engineers (ITE)

The ITE Parking Generation 5th Edition is regarded as a reliable source for parking generation. The requirements specified by ITE's Parking Generation for Multi-Family High-Rise dwellings indicate the parking demand for the site reflects a parking rate of 0.98 spaces per unit (resident and visitor supply).

6.2.2 Vehicle Ownership Rates

A review of vehicle ownership data from the Transportation Tomorrow Survey (TTS) found that 18% of residents living in apartment units in and around zones within the study area do not own a vehicle (GTA 2006 Zones 4059-4069). The study also calculated that the vehicle ownership rate for the surrounding area is approximately 1.01 vehicles/dwelling unit. **Table 6.3** summarizes the TTS data.

Appendix I includes the TTS data.

TABLE 6.3: VEHICLE OWNERSHIP – APARTMENT DWELLINGS

Year	Vehicles Per Household					Households	Vehicles	Ownership
	0	1	2	3	4			
2016	1,107	3,943	992	46	35	6123	6205	1.01
	14%	69%	16%	1%	0%			

6.2.3 Occupant Parking Utilization Surveys

Parking utilization Surveys over the last several years have been completed at a number of different multi-family developments. These surveys have consistently found that occupant parking demand varies considerably. Peak occupant parking demand differs widely across the survey data ranging from 0.65 to 1.25 occupant spaces per unit. A summary of the observed parking rates, as compiled by Paradigm, city staff and others, is outlined in Table 6.4.

Today, the City By-Law requires a combined parking rate of 1.25 spaces per unit for the residential component of the subject site. However, as noted through the historic utilization surveys, the parking rate is rarely achieved and would likely contribute to an oversupply of parking.

TABLE 6.4: HISTORIC OCCUPANT PARKING SURVEYS

Source	Date	Address	Year Built	User Group	Units	Peak Parking Demand	Rate
Paradigm	04/14/2016	1284 Guelph Line	2015	Occupant	78	51	0.65
Paradigm	04/13/2016	1284 Guelph Line	2015	Occupant	78	52	0.67
Paradigm	08/17/2016	1284 Guelph Line	2015	Occupant	78	61	0.78
Paradigm	08/23/2016	1284 Guelph Line	2015	Occupant	78	65	0.83
City	05/01/2021	1477 Lakeshore Road	2005	Occupant	60	63	1.05
City	05/06/2021	1477 Lakeshore Road	2005	Occupant	60	64	1.07
City	05/04/2021	1477 Lakeshore Road	2005	Occupant	60	66	1.10
Paradigm	11/16/2013	1980 Imperial Way	2009	Occupant	101	94	0.93
Paradigm	10/16/2013	1980 Imperial Way	2009	Occupant	101	97	0.96
Paradigm	11/16/2013	1998 Ironstone Drive	2006	Occupant	135	112	0.83
Paradigm	11/25/2022	2025 Maria Street	2018	Occupant	154	120	0.78
Paradigm	11/24/2022	2025 Maria Street	2018	Occupant	154	121	0.79
Paradigm	11/27/2022	2025 Maria Street	2018	Occupant	154	122	0.79
Paradigm	11/23/2022	2025 Maria Street	2018	Occupant	154	123	0.80
Paradigm	11/26/2022	2025 Maria Street	2018	Occupant	154	123	0.80
City	05/01/2021	2121 Lakeshore Road	1989	Occupant	39	40	1.03
City	05/06/2021	2121 Lakeshore Road	1989	Occupant	39	41	1.05
City	05/04/2021	2121 Lakeshore Road	1989	Occupant	39	42	1.08
City	05/04/2021	2121 Lakeshore Road	1989	Occupant	39	45	1.15
Paradigm	11/09/2016	360 Pearl Street	2009	Occupant	75	56	0.75
Paradigm	11/08/2016	360 Pearl Street	2009	Occupant	75	57	0.76
Paradigm	11/01/2016	360 Pearl Street	2009	Occupant	75	58	0.77
Paradigm	11/02/2016	360 Pearl Street	2009	Occupant	75	58	0.77
City	05/08/2021	360 Pearl Street	2009	Occupant	75	78	1.04
City	04/29/2021	360 Pearl Street	2009	Occupant	75	84	1.12
City	04/27/2021	360 Pearl Street	2009	Occupant	75	94	1.25
Paradigm	02/22/2014	360 Pearl Street	2009	Occupant	75	64	0.85
Paradigm	02/22/2014	399 Elizabeth Street	2006	Occupant	122	115	0.94
City	04/17/2021	442 Maple Avenue	2001	Occupant	135	139	1.03
City	04/08/2021	442 Maple Avenue	2001	Occupant	135	146	1.08
City	04/06/2021	442 Maple Avenue	2001	Occupant	135	148	1.10
City	04/06/2021	505 Locust Street	1992*	Occupant	117	103	0.88
City	04/17/2021	505 Locust Street	1992*	Occupant	117	107	0.91
City	04/18/2021	505 Locust Street	1992*	Occupant	117	121	1.03
CF Crozier	03/29/2017	5340 Lakeshore Road	2006	Occupant	42	45	1.07
Paradigm	11/01/2016	551 Maple Avenue	2012	Occupant	186	146	0.78
Paradigm	11/09/2016	551 Maple Avenue	2012	Occupant	186	148	0.80
Paradigm	02/22/2014	551 Maple Avenue	2012	Occupant	186	151	0.81
Paradigm	11/08/2016	551 Maple Avenue	2012	Occupant	186	154	0.83
Paradigm	11/02/2016	551 Maple Avenue	2012	Occupant	186	155	0.83

In auto-dominated developments, parking decisions are relatively straightforward; planners or developers can apply findings from parking generation studies. However, parking generation studies at older developments tend not to account for factors that may influence reduced dependency on parking demand (i.e. TDM measures). They also serve as an antiquated model to guide parking provision without consideration for a balanced transportation network.

To address the project needs with updated occupant parking data, additional utilization surveys have been undertaken at a relatively new condominium development in Downtown Burlington in November 2022.

The site surveyed is located at 2025 Maria Street (The Berkeley) and was constructed in 2018. The Berkeley is a 17-storey multi-family building that contains 154 residential units. The primary goal of obtaining these additional parking surveys is to clarify the current parking trends of new condominiums. It is noted that on-site parking for The Berkely is provided solely for occupants with no accommodation for visitor parking.

Surveys were conducted for four consecutive days (Wednesday to Saturday) and an overnight carryover into Sunday until 4:00 AM to capture any surge in overnight peak demand. Overall, 96+ hours of parking demand were observed at The Berkely to provide a fulsome data set of occupant parking observations.

Based on the survey data, The Berkley registered a peak demand of 0.80 occupant spaces for the survey hours. **Appendix K** contains the parking study data collected by Paradigm, the City and others.

6.2.4 Occupant Regression Equation Analysis

The collection of the occupant parking utilization data over several years enabled a unique statistical analysis and the development of a model for predicting parking utilization at multi-family residential developments. Based on the field data collected by Paradigm, City staff and others, a regression analysis was developed to create a statistical model that best describes the relationship between parking utilization and demand.

To construct the regression analysis, many approaches were tested to find the best method of including, removing, and assembling the best data points. Ultimately, the goal was to find the data set that provided the most robust theoretical framework while remaining relevant from a practical development and planning standpoint.

As multiple survey days were collected at each site, **only the highest observed parking demand was used in the statistical analysis**,

given this was the peak parking demand observed at the site. The thought behind this is the objective of the analysis is to estimate the total quantity of parking that would be demanded at a given property to provide peak characteristics of each survey site. Therefore, it is not desirable for the model to consider situations where parking utilization was lower on other survey dates because we are only interested in capturing peak demand.

In the end, 29 surveys were removed based on this, resulting in a final sample size of 11 independent properties. A summary of the final sample size is outlined in **Table 6.5**. The coefficient of determination (R^2) for occupant parking is 0.88. In terms of statistical analysis, as an R^2 value approaches 1.0, the better the fit; as the R^2 value approaches zero, the worse the fit. The final equation for the model is: **Y=0.7591x + 19.935**

Appendix L contains the occupant parking demand models.

Based on the regression equation using 305 units, the estimated occupant parking demand for the site is 252 spaces (0.83 spaces per unit).

TABLE 6.5:REGRESSION ANALYSIS SAMPLES

Source	Date	Address	Year Built	User Group	Units	Peak Parking Demand	Rate
CF Crozier	03/29/2017	5340 Lakeshore Road	2006	Occupant	42	45	1.07
City	04/06/2021	442 Maple Avenue	2001	Occupant	135	148	1.10
City	04/18/2021	505 Locust Street	1992*	Occupant	117	121	1.03
City	04/27/2021	360 Pearl Street	2009	Occupant	75	94	1.25
City	05/04/2021	1477 Lakeshore Road	2005	Occupant	60	66	1.10
City	05/04/2021	2121 Lakeshore Road	1989	Occupant	39	45	1.15
Paradigm	08/23/2016	1284 Guelph Line	2015	Occupant	78	65	0.83
Paradigm	10/16/2013	1980 Imperial Way	2009	Occupant	101	97	0.96
Paradigm	11/02/2016	551 Maple Avenue	2012	Occupant	186	155	0.83
Paradigm	11/16/2013	1998 Ironstone Drive	2006	Occupant	135	112	0.83
Paradigm	11/26/2022	2025 Maria Street	2018	Occupant	154	123	0.80



6.2.5 Visitor Demand

As The Berkely does not provide for any on-site visitor parking, additional parking surveys concerning visitor demand within Downtown Burlington were not undertaken.

In that respect, in 2021, the City of Burlington undertook parking surveys in advance of the Major Transit Station Area (MTSA) Area Specific Planning which is anticipated to be completed in 2022. The City collected visitor parking survey data in Downtown Burlington from April 2021 to May 2021. City staff surveyed the following two sites with respect to visitor parking demands:

- 442 Maple Avenue – 135 residential units
- 2121 Lakeshore Road – 39 residential units

A summary of the observed parking rates as compiled by city staff is outlined in **Table 6.6**. Peak visitor parking demand within Downtown Burlington was consistent at these two-site, varying from 0.00 to 0.07 spaces.

As only two sites have been observed regarding visitor parking demand within Downtown Burlington, there is insufficient data to provide a regression analysis. Instead, as previously noted by the City staff, an acceptable approach is using the average rate to determine an appropriate visitor supply.

Based on the data set compiled by the City staff, an average visitor parking demand of 0.03 spaces per unit is identified for Downtown Burlington. As City staff have previously supported this visitor supply rate and no new supplemental visitor parking surveys could be completed at The Berkely, it is recommended that a parking supply rate of 0.03 spaces per unit be considered for the site's visitor requirement.

6.2.6 Combined Rate

Based on the calculated occupant and visitor demand rates, the proposed residential parking supply of 379 spaces (1.24 spaces per unit) is supportable.

As a general comparison, the calculated parking data outlines a combined rate of 0.86 spaces per unit, while the ITE rates outline a combined rate of 0.98 spaces per unit. The calculated rates are noted to be slightly lower than the ITE requirements; however still relatively consistent in that a combined rate (residential and visitor) of 1.00 spacer per unit is supportable.

TABLE 6.6: CITY-SUPPLIED VISITOR PARKING SURVEYS

Source	Date	Address	Year Built	User Group	Units	Peak Parking Demand	Rate
City	05/01/2021	2121 Lakeshore Rd	1989	Visitor	39	1	0.03
City	05/01/2021	2121 Lakeshore Rd	1989	Visitor	39	1	0.03
City	04/05/2021	2121 Lakeshore Rd	1989	Visitor	39	1	0.03
City	04/05/2021	2121 Lakeshore Rd	1989	Visitor	39	1	0.03
City	04/06/2021	2121 Lakeshore Rd	1989	Visitor	39	1	0.03
City	05/01/2021	2121 Lakeshore Rd	1989	Visitor	39	2	0.05
City	05/06/2021	2121 Lakeshore Rd	1989	Visitor	39	0	0.00
City	05/06/2021	2121 Lakeshore Rd	1989	Visitor	39	0	0.00
City	04/17/2021	442 Maple Ave	2001	Visitor	135	4	0.03
City	04/17/2021	442 Maple Ave	2001	Visitor	135	4	0.03
City	04/06/2021	442 Maple Ave	2001	Visitor	135	5	0.04
City	04/06/2021	442 Maple Ave	2001	Visitor	135	5	0.04
City	04/06/2021	442 Maple Ave	2001	Visitor	135	6	0.04
City	04/08/2021	442 Maple Ave	2001	Visitor	135	5	0.04
City	04/208/2021	442 Maple Ave	2001	Visitor	135	5	0.04
City	04/08/2021	442 Maple Ave	2001	Visitor	135	8	0.06
City	04/17/2021	442 Maple Ave	2001	Visitor	135	9	0.07
				Average	**90**	**3**	**0.03**

6.3 Policy Framework

6.3.1 Sustainability

Traditionally, transportation networks focused on increasing the road network's capacity to accommodate more vehicles. However, as outlined in the Region of Halton's Transportation Master Plan[9] (TMP), the transportation system needs to look at a “balanced needs” approach that encourages alternative modes of transportation.

The City of Burlington’s OP identifies an integrated and multi-modal transportation system that will be achieved by prioritizing decision-making to shift more trips away from the private car and to more sustainable transportation options, such as walking, biking, transit and car sharing.

The intent is to reprioritize mobility to balance the transportation system. A more sustainable city requires an integrated transportation system that supports a compact urban form. Bringing jobs, housing services, and amenities closer together encourages non-automobile modes of travel, providing more choices to Burlington residents.

6.3.2 Burlington Climate Emergency

Climate change and air pollution must be addressed to achieve a sustainable community and human and ecosystem health. Climate change and air pollution impacts are caused primarily by burning fossil fuels, resulting in greenhouse gases and air pollutants emissions. These impacts can be reduced through sustainable and efficient land use and transportation policies that reduce air and greenhouse gas emissions.

Burlington’s Council unanimously passed a motion to declare a climate emergency in 2019 and directed staff to complete a Climate Action Plan. Council has identified Burlington as “feeling the effects of climate change over the past several years,” Climate change is ranked as the third highest risk on the City’s Enterprise Risk Register, which measures overall risk to the city.

The City’s Climate Action Plan includes seven key program areas to help the community transition away from the use of fossil fuels, particularly for buildings and transportation:

- Low Carbon New Building Guideline

[9] The Road to Change, Halton Region Transportation Master Plan 2031, Dillion + GHD, 2011

- Deep Energy Retrofit Program
- Renewable Energy Cooperative
- Integrated Mobility Plan
- Electric Mobility & Equipment Program
- Waste Reduction Initiative
- Industrial Innovation Program

Of importance are the goals of the Climate Action Plan. Specifically, the city will work toward being a net carbon-neutral community by the year 2050, with an interim target of reducing emissions to 50% below 2016 levels by 2030. However, to meet the 2050 goal, the city will need to offset carbon dioxide emissions by purchasing carbon offsets, or through further actions to reduce emissions.

To achieve the reductions needed to meet the city's emissions target, significant change is required as soon as possible. If Burlington's current emissions patterns do not decrease, the carbon budget will run out in 8.5 years, the same amount of time as remaining in the global budget[10]. As the climate emergency declaration is a Council priority, the importance of supporting a low-carbon redevelopment project that focuses on integrated mobility is apparent.

6.3.3 Parking and Emissions

While single-occupant vehicle trips are commonly targeted in transport policies, they are only a consequence of the spatial layout and densities of the accompanying land uses. Therefore, there is merit in targeting the underlying cause of these carbon emissions rather than solely focusing on policies to reduce private vehicle use.

Parking management has an important role to play as an instrument in reducing carbon emissions[11]. In this respect, car parking is the "glue" between these facets of land use and the transport environment. In addition, car parking is a critical factor which can be targeted relatively easily by planners and their municipality plans.

The transportation sector is responsible for 23% of Canada's GHG emissions[12] and offers tremendous opportunities for significant emissions reduction. To reduce emissions, municipalities need to drive a transition towards zero and low-emissions transportation modes,

[10] Climate Action Plan, City of Burlington, April 2020
[11] Parking as a tool to reduce carbon emissions, McCormick Rankin Cagney Pty Ltd, 2009
[12] Reducing GHG Emissions in Canada's Transportation Sector, Clean Energy Canada, June 2016.

increase the use of cleaner fuels, improve public transit ridership, and encourage denser, mixed-use communities. Municipalities in Canada are lagging behind other countries in supporting zero-emission vehicles and other sustainable transportation policies. Significant encouragement is needed to shift travel modes from single-occupant vehicles towards public transit, auto-share and active transportation to reduce greenhouse gas emissions related to the transportation sector.

6.3.4 Societal Changes

A sudden, dramatic shift in travel patterns occurred early in 2020 as society adjusted to the emergence of COVID-19, its declaration as a pandemic and subsequent public health measures to stop its spread.

As a result, recent societal changes have made living easier without owning a car. Online shopping has reduced the need for a vehicle to bring large purchases home and, in some areas, has made it convenient for everyday errands to be delivered (i.e., groceries and household items). Vehicles-for-hire and bicycles have both increased in popularity. The future arrival of automated vehicles may further support a reduction in personal automobile ownership and use. These societal changes will decrease the need for vehicle parking with a shift to curbside management.

As businesses have adapted and residents have embraced the convenience of the delivery of everyday items, these changes will likely remain for the foreseeable future, providing further incentive to residents not to require a vehicle.

Results from the 2016 TTS show that approximately 4% of households in Burlington do not own a vehicle. When looking at the downtown area (South of QEW and West of Guelph Line), where there is a greater proportion of apartments and high-density developments, this number increases to 14%. It is likely that these proportions have increased since 2016 and will continue to increase due to societal changes.

Given the expected changes in automobile ownership brought about by the changes in mobility-related technologies, it is likely that if change is parking policy framework is not revised, new residential developments will be left with an oversupply of parking, which, if provided below grade, will result in redundant space that will not be repurposed in the future.

6.3.5 Electric Vehicles

There are two general approaches to reducing transportation emissions: cleaner vehicle strategies that reduce travel emission rates

and vehicle travel reduction strategies that reduce the total distance travelled.

Electric vehicles are much more efficient than internal combustion engine (ICE) powered vehicles, so the adoption of electric vehicles significantly contributes to greater efficiency and lower conversion losses in low-carbon developments. Electric vehicles, however, typically cost more than a typical combustion-powered vehicle. Even with tax credits and limited maintenance required, the capital cost to afford an electric vehicle is high and primarily benefits affluent households that purchase new vehicles rather than cater to a portion of the population seeking affordable housing[13]. Additionally, if each ICE-powered vehicle is transitioned to an electric vehicle, single-occupant use would still be present, creating automobile-dependent transportation systems and sprawled development patterns.

Table 6.7 outlines a basic framework for comparing the various strategies.

TABLE 6.7: COMPARING EMISSION REDUCTION STRATEGIES

Community Goal	Electric Vehicle	Reduced Travel
Congestion reduction	Worse	Better
Roadway cost savings	Worse	Better
Consumer savings and affordability	Mixed	Better
Traffic safety	Worse	Better
Mobility options for non-drivers	Worse	Better
Energy conservation	Better	Better
Pollution reduction	Better	Better
Physical fitness and health	Worse	Better
More compact development	Worse	Better

Although electric vehicles reduce greenhouse gas emissions, they tend to increase total vehicle travel and encourage sprawl development, reducing their net benefits and external costs.

However, through the lens of economic, social, and environmental goals, reduced travel is consistent with the Region's TMP and the City's OP, which calls for a "balanced" transportation system.

6.3.6 Affordable Housing

Access to safe, affordable, and adequate housing touches almost every aspect of a community's well-being and affects all its members.

[13] Win-Win Transportation Emission Reduction Strategies, Victoria Transport Policy Institute, April 2021.

Communities with a range of housing choices that meet the full range of their housing needs - including the needs of low- and moderate-income citizens - are generally more liveable, more economically competitive and resilient, and this is one of the objectives of the City's strategic plan[14].

The cost of providing parking, particularly in areas of higher land costs and where underground parking is needed, can add significantly to development costs. The City of Burlington can reduce capital and maintenance costs for itself and developers while facilitating pedestrian-friendly and transit-supportive areas through agreements that reduce requirements or exempt owners or occupants of a building from providing and maintaining parking facilities, mainly where public transit is available. This helps to facilitate pedestrian-friendly and transit-supportive areas[15].

Parking minimums increase the cost of housing by adding to construction costs, which may be passed on to residents. The ability, however, for residents to avoid the cost of parking by choosing a home without parking is limited by the existence of minimum parking requirements that represent a barrier to accommodating affordable housing.

6.4 Summary of Parking Demand

Minimum parking requirements have long been a staple of planning regulations based on some formulation. These regulations, unfortunately, have been driven by auto-centric engineering models. Over the past seven decades, the built form in Burlington has evolved significantly. Recent changes in transportation technology and services, characterized by ride-hailing and automobile sharing, and the emerging technologies dominated by autonomous vehicles (AVs) suggest that automobile ownership is likely to experience declines in the future.

The City of Burlington's strategic vision is about creating an attractive and safe City that evokes pride, passion, and a sense of belonging - a city where people of all ages and abilities can enjoy a good quality of life. The Official Plan (OP) emphasizes the importance of fundamental rights, including embracing sustainability and creating a vision for complete compact communities served by streets made for walking, cycling and an attractive transit system. This vision is supported by policies aimed at reducing auto dependence and limiting the amount of

[14] 2018-2022 Burlington's Plan From Vision to Focus, 2019
[15] Ministry of Municipal Affairs and Housing, Municipal Tools for Affordable Housing, 2011

land occupied by automobile parking. The transportation policies are deliberately interspersed with the land use policies to emphasize the importance of considering both areas to achieve the overall vision of complete compact communities.

The intent is to reprioritize mobility to balance the transportation system. A more sustainable city requires an integrated transportation system that supports a compact urban form. Bringing jobs, housing services, and amenities closer together encourages non-automobile modes of travel, providing more choices to Burlington residents.

Burlington's Council has further identified Burlington as "feeling the effects of climate change over the past several years," and climate change is ranked as the third highest risk on the City's Enterprise Risk Register. Specifically, the city's Climate Action Plan stipulates Burlington will work toward being a net carbon-neutral community by the year 2050. Significant change is required to achieve the reductions needed as soon as possible.

If the City wishes to encourage active transportation and transit-friendly neighbourhoods as outlined in the OP and strategic vision, the City needs to recognize that minimum parking requirements present a significant barrier to these goals. It needs to be recognized that parking carries substantial costs, heavily subsidizes the choice to drive, and hampers the ability to promote sustainable development. Parking should not be viewed as only an amenity required to support our cities and our ability to drive; instead, it must be viewed as a significant economic investment that carries with it outcomes that shape our cities and regions.

The site will be in existence well beyond 2050, when it is anticipated that autonomous vehicles will play a more significant role in our mode choice. Auto ownership is expected to be significantly reduced when we can request a vehicle on demand for our travel needs. Recent societal changes have made it easier to live without owning a car. Vehicles-for-hire and bicycles have both increased in popularity. Online shopping has reduced the need for a vehicle to bring large purchases home and, in some areas, has made it convenient for everyday errands to be delivered (i.e., groceries and household items). The future arrival of automated vehicles will further reduce personal automobile ownership, and these societal changes will decrease the need for vehicle parking. Lastly, as documented in the City-Wide Parking Standards Review[16]:

[16] Burlington City-Wide Parking Standards Review, IBI Group, July 21, 2017

"It is also important to clarify the role of residential parking requirements. In general, there is little risk in reducing minimum residential parking requirements as availability of parking is a key decision in an individual's residential choice. Developers are well attuned to their potential customers' parking needs and will not reduce parking provision so much as to compromise the marketability of their development."

Based on empirical survey data that both Paradigm and the City staff have collected at multi-family residential buildings in Burlington, as well as a review of industry parking data and policy framework of the Growth Plan, the Provincial Policy Statement and Burlington's OP, a reduced parking supply for the proposed development is supportable.

Overall, the proposed parking supply of 435 spaces plus 27 tandem spaces, is appropriate and supportable for the proposed development.

7 Transportation Demand Management

The goal of a Transportation Demand Management (TDM) plan is to reduce the development's overall traffic and parking impacts through the implementation of strategies that are aimed at affecting the demand side of the transportation equation rather than the supply side. By their very nature, TDM programs attempt to change people's behaviour, and to be successful; they must rely on incentives or disincentives to makeshifts in behaviour attractive to the commuter.

TDM strategies include financial incentives, time incentives, the provision of new or enhanced commuter services, dissemination of information, and marketing alternative services. TDM strategies include all the incentives and disincentives that increase the likelihood for people to change their existing travel behavior.

The TDM plan has been formulated to extend reasonable and practical strategies that encourage residents and visitors to take alternative modes of transportation. The strategies identified are expected to improve transportation access and connectivity within the development and reset the study area. For each strategy, an explanation and a description of what the applicant is proposing to provide are provided.

7.1 Through Design

Supporting land-use/infrastructure that encourage people to choose travel modes other than driving alone are a number of factors that influence peoples' travel mode choices. These strategies are already accounted for through the developments overall design and include the following.

7.1.1 Housing Density

Designing the plan with increased densities reduces Greenhouse Gas (GHG) emissions associated with traffic in several ways. Density is usually measured in terms of persons, jobs, or dwellings per unit area. Increased densities generally shorten the distance people travel and provide greater options for their travel mode. This strategy also provides a foundation for the implementation of many other strategies which would benefit from increased densities.

7.1.2 Land Use-Density Mix

Having different types of land uses in close proximity can decrease vehicle mode share since trips between land use types are shorter and may be accommodated by non-automotive transportation. The mix of high-density housing and commercial uses provides land use diversity

that should reduce the number of automobile trips that residents or employees make.

7.1.3 Pedestrian Facilities

Accessibility to and from a development is essential in helping to ensure that those that can walk, do. Proper pedestrian connections from the surrounding community to the development should be constructed to ensure safety and enhance the overall pedestrian experience.

Walking is encouraged by the provision of a pedestrian-friendly site layout that features an extensive network of sidewalks and entrances at key points both within the site and connecting to the existing pedestrian network. The majority of the site is provided with direct public access for pedestrians via multiple street level entrances from Brant Street and John Street. This is intended to provide a comprehensive network of pedestrian connections to allow for an enhanced pedestrian experience for all users of the site.

By taking advantage of the future public sidewalk network to attract and serve pedestrians, combined with multiple pedestrian connections within site, the development offers walkability as one of the critical design features.

7.1.4 Bicycle Facilities

Increasing bicycling to, from and within Burlington is a crucial strategy for reducing vehicle trips. The number of people bicycling is directly related to the quality of the bicycling network and the presence of bicycle facilities. As outlined in **Section 2.3.2**, Brant Street has bicycle lanes.

7.1.5 Transit

The use of transit places less reliance on personal automobiles for trips that convenient and desirable transit options can complete. Providing convenient and desirable transit can be provided by providing well-lit transit stops with seating and weather-protective shelters. Additional amenities, including bicycle parking, schedule information, real-time bus status, and maps, can increase the convenience of the transit network.

The subject site is currently served by two (2) BT Routes that operate primarily on Brant Street, connecting Burlington GO Station, Aldershot GO Station, and the Appleby GO Station. Headways are on the order of 30 minutes during most service hours, with shorter headways provided during peak-hour services.

The closest bus stop is less than 100 metres (2-minute walk) away along Brant Street north of the site.

The improvement of these stops, including the installation of bus shelters with seating, would enhance the transit services. Through these modifications, the transit network would be a viable and convenient option for residents, visitors and employees of the development.

At the development level, direct links connecting residents and visitor to nearby bus stops are planned to be provided as part of the overall design scheme making the development area more navigable towards local bus stops.

7.2 Proposed Strategies

The development should consider the proposed strategies identified herein to reduce the number of auto-trips made to/from the development:

7.2.1 Transportation Information

The applicant will consider developing marketing/informational materials as part of their initial scope of work. Information on transportation options and/or links to the appropriate website should be conveyed to all prospective residents as a component of a resident welcome packet.

Available information should include schedules for local and regional transit services, bicycle and trail networks and the location of retail and recreational establishments.

7.2.2 Parking Supply

The role of parking management is also a key element to helping Burlington meet its trip reduction goals. Free and abundant parking encourages people to drive alone rather than car or van pool, be dropped off or picked up, walk, cycle or take transit. If free and unregulated parking is provided, there is little incentive for many residents and visitors to use alternative modes of transportation. When too much parking is provided, and is provided free of cost to the user, the use of alternative sustainable modes is put at a substantial disadvantage.

As the development promotes the use of other modes of transportation through limited on-site parking that will meet the projected demand, the development plays a significant role in setting an example for residents and visitors to consider non-automotive travel.

7.2.3 Bicycle Parking Supply

The City of Burlington Zoning By-law requirements stipulate a total of 2 bicycle parking spaces plus 1 space for every 100 square metres of retail space is provided. The site proposed 176 square metres of retail space equating to a bicycle requirement of 6 spaces.

The development exceeds this requirement by providing a total of 129 bicycle parking spaces.

8 Conclusions and Recommendations

8.1 Conclusions

Transportation Impact Study

This study evaluates existing conditions and the impacts of background traffic growth and projects the impacts of the redevelopment.

Full-build out of the redevelopment will generate 147 AM new peak hour trips and 165 PM new peak hour trips.

Under the future background scenario, localized congestion is forecast at study area intersections. Operations at the Fairview Street and Brant Street intersection are forecast to degrade with background traffic growth, resulting in multiple movements operating at critical levels. In general, left-turning movements from the east-west streets onto Brant Street can be expected to experience some queuing issues. 95th percentile queues are forecast to extend beyond the available storage for certain left-turning movements however, average queue length are forecast to be accommodated by the available storage.

Background traffic growth along Brant Street results in eastbound/westbound traffic from Olga Drive/Rambo Crescent operating with delays in the LOS F range, particularly during the AM peak hour. Though traffic on Olga Drive/Rambo Crescent is not forecast to grow significantly, the delays are expected to grow due to increases in north/south traffic leaving less gaps for the stop-controlled eastbound/westbound movements. A signal could improve traffic operations, however it is not warranted or recommended based on the intersection spacing. It is likely that with increasing delays, neighbourhood traffic will gradually divert to Blairholm Avenue and Ghent Avenue for signalized intersections.

The redevelopment of the subject site is anticipated to have a negligible effect on traffic operations within the study area. Individual movement delays are expected to increase by less than 20 seconds during the AM and PM peak hours as a result of the site traffic. The exception to this being Olga Drive/Rambo Crescent where the critical eastbound/westbound delays are increased further due to the increase in traffic along Brant Street.

The south driveway is forecast to operate with delays in the LOS D range and are not forecast to exceed 45 seconds during the AM and PM peak hours. The inbound movements to the north access are

forecast to operate with delays in the LOS B range are not expected to exceed 15 seconds during the AM and PM peak hours.

The analysis indicates the existing transportation infrastructure is adequate for accommodating additional traffic associated with the proposed development. No roadway improvements are required to facilitate the proposed development.

Parking Justification

Parking requirements for the development under the City's Zoning By-Law is 438 parking spaces, equating to a parking rate of 1.25 parking spaces per unit and 3.5 spaces per 100 square metres of retail GFA. The development is proposing a parking supply of 435 spaces (435 spaces plus 27 tandem spaces): 379 residential spaces (1.24 spaces per unit) and 56 retail spaces (3.5 spaces per 100 m^2 GFA). The proposed parking supply is 3 spaces less than the Zoning By-Law requirement.

Parking utilization Surveys over the last several years at a number of different multi-family developments have consistently found that occupant parking demand varies considerably between 0.65 to 1.25 occupant spaces per unit. Additional utilization surveys have been undertaken at a relatively new condominium development in Downtown Burlington in November 2022.

The site surveyed is located at 2025 Maria Street (The Berkeley) and was constructed in 2018. On-site parking for The Berkely is provided solely for occupants with no accommodation for visitor parking. Based on the survey data, The Berkley registered a peak demand of 0.80 occupant spaces for the survey hours.

Based on empirical survey data that both Paradigm and the City staff have collected at multi-family residential buildings and a review of industry parking data and policy framework of the Growth Plan, the Provincial Policy Statement and Burlington's OP, a reduced parking supply for the proposed development is supportable.

Overall, the proposed parking supply of 435 spaces plus 27 tandem spaces, is appropriate and supportable for the proposed development based on parking data collected by both Paradigm and city staff.

8.2 Recommendations

Based on the findings of this study, it is recommended that:

- The City of Burlington recognizes the conclusions drawn above;
- The City continues to monitor traffic operations at study area signalized intersections and adjusts signal timings as needed; and
- The City of Burlington support the proposed Zoning By-law parking rate to allow the provision of 1.24 parking spaces per unit.

Appendix A

Pre-Study Consultation

Greg Lue

From: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Sent: November 28, 2022 2:56 PM
To: Greg Lue
Cc: Adam Makarewicz
Subject: RE: 210691 - 688 Brant Street, City of Burlington TIS & Parking Study - Terms of Reference

Hi Greg,
I have no further comments.
As for background traffic, please visit this webpage for all the current development applications - Current Development Projects - City of Burlington
Thanks,

Dan Ozimkovic, C.E.T., A.Sc.T.
Transportation Planning Technologist
Transportation Services Department
City of Burlington
Our working hours may be different. You are not obligated to reply outside of your typical working hours.

From: Greg Lue <glue@ptsl.com>
Sent: Monday, November 28, 2022 2:25 PM
To: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Cc: Adam Makarewicz <amakarewicz@ptsl.com>
Subject: RE: 210691 - 688 Brant Street, City of Burlington TIS & Parking Study - Terms of Reference

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Hi Danijel,
Just following up on this to see if the City had any additional comments on the study.

Thanks,

Greg Lue, M.A.Sc., P.Eng.
Transportation Engineer

Paradigm Transportation Solutions Limited
p: 905.381.2229 x307
m: 905.981.7479

*** *Paradigm is now operating on a 4-day workweek. Our offices are closed Fridays.* ***

From: Scattolon, Walter <Walter.Scattolon@halton.ca>
Sent: May 17, 2022 4:57 PM
To: Greg Lue <glue@ptsl.com>; danijel.ozimkovic@burlington.ca
Cc: Adam Makarewicz <amakarewicz@ptsl.com>; Huycke, Adam <Adam.Huycke@halton.ca>; Krusto, Matt

<Matt.Krusto@halton.ca>
Subject: RE: 210691 - 688 Brant Street, City of Burlington TIS & Parking Study - Terms of Reference

Hello Greg,

The Region's only interest in this development from a TIS perspective is to ensure impacts to the Regional Intersection at Brant Street/Fairview Street are assessed.

Please consider adding the Brant Street/Fairview Street intersection to the Study Area Intersections.

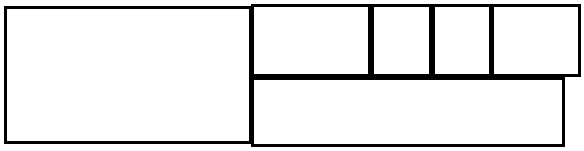
Please obtain any available traffic data / signal timing plans via request to trafficdatarequests@halton.ca for Regional roads/intersections.

Please consult the Region's TIS Guideline for report requirements
here: https://www.halton.ca/Repository/Transportation-Impact-Study-Guidelines

The City of Burlington staff may have more comments for you, and we trust those will be adhered to in the TIS report and analysis.
We look forward to the TIS circulation.
Thank you,

Walter Scattolon

Walter Scattolon, BASc (Eng.), PMP
Project Manager I, Transportation Planning Coordination
Infrastructure Planning & Policy
Public Works
Halton Region
905-825-6000, ext. 2687 | 1-866-442-5866



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From: Greg Lue <glue@ptsl.com>
Sent: Friday, May 13, 2022 9:54 AM
To: danijel.ozimkovic@burlington.ca; Scattolon, Walter <Walter.Scattolon@halton.ca>
Cc: Adam Makarewicz <amakarewicz@ptsl.com>
Subject: 210691 - 688 Brant Street, City of Burlington TIS & Parking Study - Terms of Reference

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Hi all,

Paradigm Transportations Solutions Limited has been retained to conduct a Transportation Impact Analysis and Parking Study for a proposed development of 688 Brant Street in the City of Burlington. The property owner is proposing to redevelop the lands with two 11-storey towers with residential units and ground floor commercial space. The development proposes 310 residential units (comprised of 274 one-bed plus ben units, and 36 two-bed units) and 1,196m2 (12,872 sq.ft) of ground floor commercial space.

Vehicle access is proposed via two driveway connections to Brant Street. A preliminary site plan is attached.

A total parking supply of 380 spaces is proposed. This supply does not meet Burlington zoning requirements as currently planned.

Proposed Terms of Reference

Study Area Intersections

- Brant Street & Prospect Street/Grahams Lane (signalized);
- Brant Street & Ghent Avenue (signalized);
- Brant Street & Rambo Crescent/Olga Drive (unsignalized);
- Brant Street & Blairholm Avenue (signalized);
- Brant Street & Victoria Avenue/Baldwin Street (signalized); and
- Two site driveways.

Existing Data

- Does the City have recent TMC data for the study area intersections that would be appropriate for use in the study?
- Does the City have any concerns with new traffic data being collected in the coming weeks? Should we rely on historical count volumes and factor the historical data to a baseline condition using a generalized growth rate (see below)?

Horizon Years

- 2022 Base Year
- Five years from date of study (2027)

Analysis Periods

- Weekday AM peak hour
- Weekday PM peak hour

Analysis

- Synchro 10
- HCM 2000
- SimTraffic Queueing (five 60-min iterations)

Background Traffic

- Generalized growth rate 2% per annum
- Traffic generated by any in stream developments in the area. **City of Burlington**– can you comment on this and provide any relevant studies or inputs to estimate the traffic for the site(s)?

Site Traffic Estimates

- ITE Trip Generation Data 11th Edition
- No modal split reductions

Site Traffic Distribution

- Existing travel patterns/TTS data

Parking Study

- Parking generation for the site will be calculated using parking rates obtained from ITE Parking Generation Manual and Zoning By-Law comparisons.
- A parking rate will be recommended that is deemed applicable to the subject site taking into account the development's location. The recommended rate will then be used to estimate the number of parking spaces needed to meet the projected parking demand. The estimated parking supply needed will be compared to the

By-law required supply to assess the feasibility of providing less than the By-law supply requirements. In the event that the parking review determines that a parking reduction cannot be justified, the report will speak to this point.

Report

- We will document the study methodologies, findings, and conclusions in a report with appendices containing the detailed analysis results and any data collected.

Please let us know if you have any comments or questions.

Thanks,

Greg Lue, M.A.Sc., P.Eng.
Transportation Engineer



Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 905.381.2229 x307
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w: www.ptsl.com

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Appendix B

Existing Traffic Counts & Signal Timings

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:15:00
To: 9:15:00

Municipality: Burlington
Site #: 2006800001
Intersection: Fairview St & Brant St
TFR File #: 1
Count date: 17-Sep-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Fairview St runs W/E

North Leg Total: 1490
North Entering: 768
North Peds: 5
Peds Cross: ⋈

Heavys	6	5	13	24
Trucks	3	8	1	12
Cars	72	507	153	732
Totals	81	520	167	

Heavys	24
Trucks	6
Cars	692
Totals	722

East Leg Total: 1219
East Entering: 458
East Peds: 25
Peds Cross: ⧖

Brant St

Heavys	Trucks	Cars	Totals
31	8	389	428

Fairview St

Cars	Trucks	Heavys	Totals
123	1	8	132
202	2	18	222
97	2	5	104
422	5	31	

N
W E
S

Heavys	Trucks	Cars	Totals
9	1	145	155
21	3	443	467
6	1	156	163
36	5	744	

Fairview St

Cars	Trucks	Heavys	Totals
717	4	40	761

Brant St

Peds Cross: ⧖
West Peds: 6
West Entering: 785
West Leg Total: 1213

Cars	760
Trucks	11
Heavys	16
Totals	787

Cars	115	424	121	660
Trucks	3	4	0	7
Heavys	7	7	6	20
Totals	125	435	127	

Peds Cross: ⋈
South Peds: 5
South Entering: 687
South Leg Total: 1474

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 12:00:00
To: 14:00:00

One Hour Peak
From: 12:45:00
To: 13:45:00

Municipality: Burlington
Site #: 2006800001
Intersection: Fairview St & Brant St
TFR File #: 1
Count date: 17-Sep-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Fairview St runs W/E

North Leg Total:	1938			
North Entering:	901			
North Peds:	11			
Peds Cross:	⋈			
Heavys	4	3	5	12
Trucks	4	8	2	14
Cars	134	553	188	875
Totals	142	564	195	
Heavys	16			
Trucks	14			
Cars	1007			
Totals	1037			
East Leg Total:	1902			
East Entering:	975			
East Peds:	45			
Peds Cross:	⧖			

Brant St

Heavys	Trucks	Cars	Totals
21	10	867	898

Fairview St

Cars	Trucks	Heavys	Totals
245	2	10	257
549	4	12	565
149	1	3	153
943	7	25	

N
W E
S

Heavys	Trucks	Cars	Totals
4	4	231	239
11	1	564	576
9	2	176	187
24	7	971	

Fairview St

Cars	Trucks	Heavys	Totals
901	7	19	927

Brant St

Peds Cross:	⧖			
West Peds:	17			
West Entering:	1002			
West Leg Total:	1900			
Cars	878			
Trucks	11			
Heavys	15			
Totals	904			
Cars	184	531	149	864
Trucks	2	8	4	14
Heavys	5	2	3	10
Totals	191	541	156	
Peds Cross:	⋈			
South Peds:	7			
South Entering:	888			
South Leg Total:	1792			

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

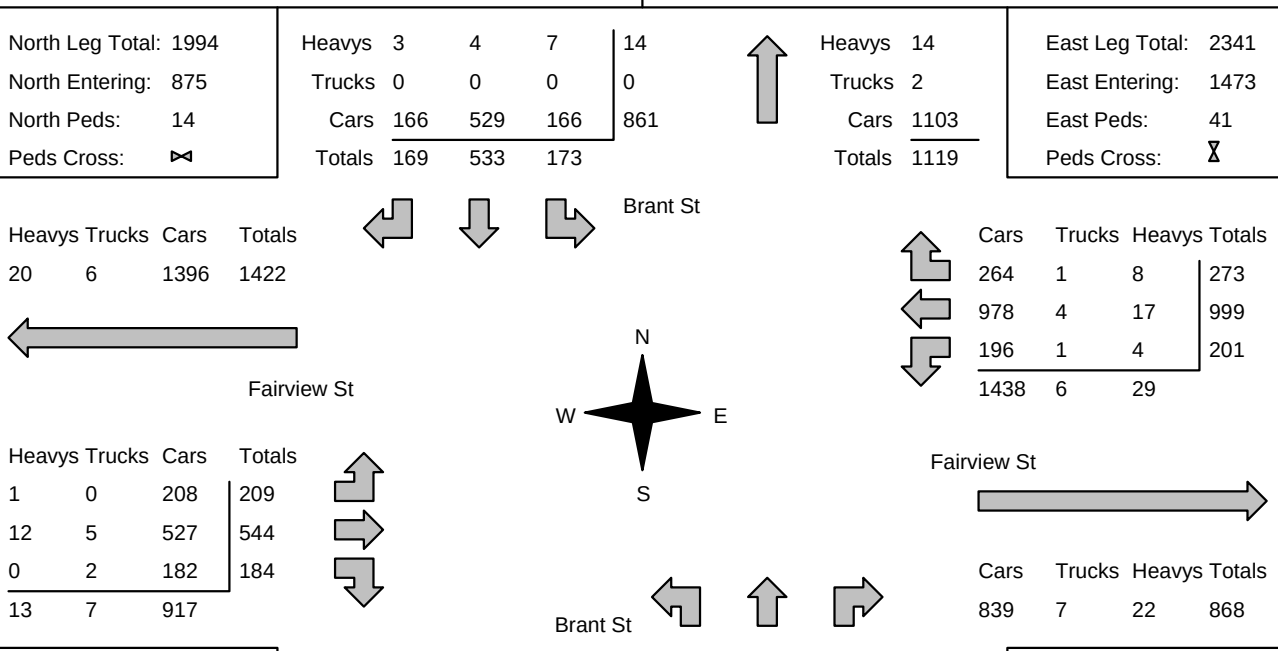
Municipality: Burlington
Site #: 2006800001
Intersection: Fairview St & Brant St
TFR File #: 1
Count date: 17-Sep-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Total Count Diagram

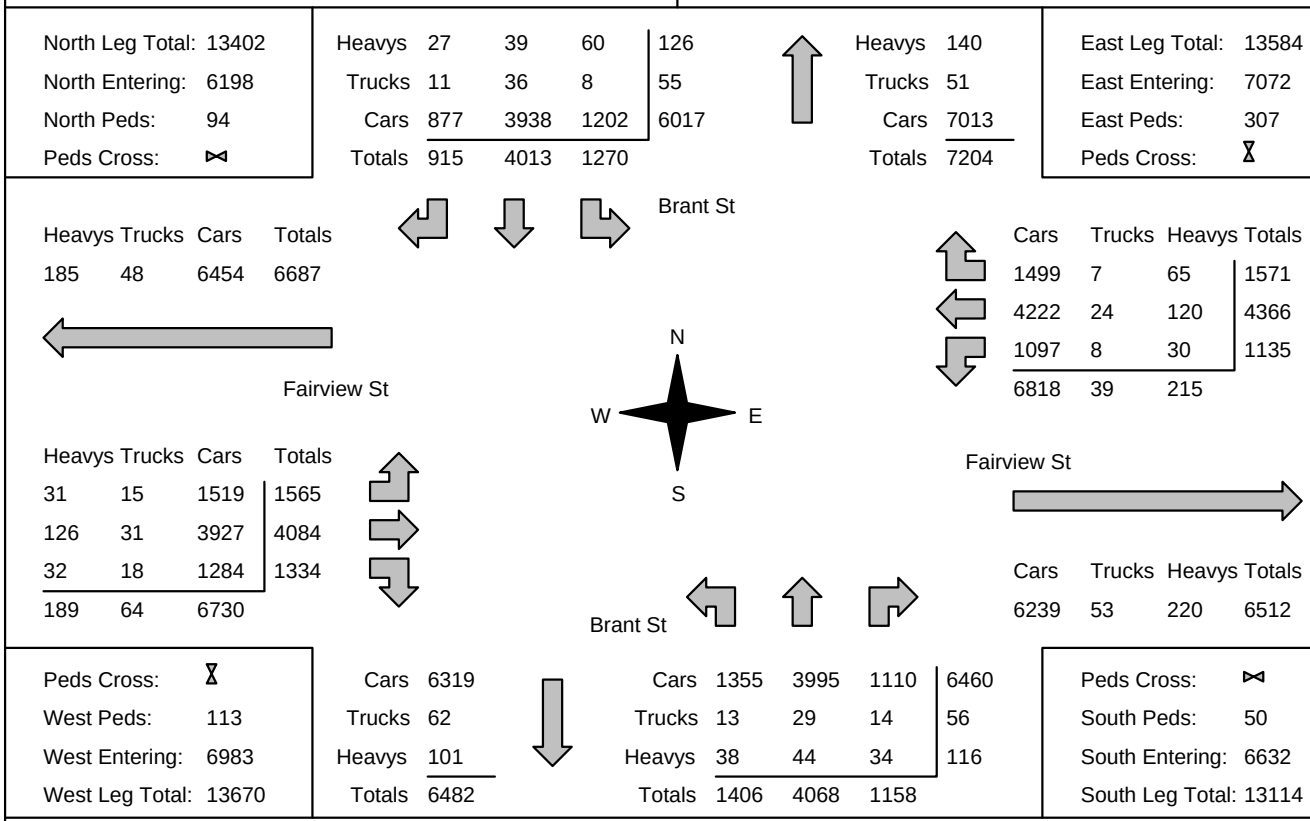
Municipality: Burlington
Site #: 2006800001
Intersection: Fairview St & Brant St
TFR File #: 1
Count date: 17-Sep-20

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Fairview St & Brant St | **Count Date:** 17-Sep-20 | **Municipality:** Burlington

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	North/South Total Approaches
	Left	Thru	Right	Grand Total		
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*
8:00:00	*92*	*308*	*37*	*437*	*5*	*974*
9:00:00	*161*	*522*	*68*	*751*	*5*	*1462*
10:00:00	*153*	*478*	*77*	*708*	*10*	*1369*
12:00:00	*0*	*0*	*0*	*0*	*0*	*0*
13:00:00	*182*	*533*	*138*	*853*	*16*	*1705*
14:00:00	*197*	*543*	*128*	*868*	*13*	*1782*
15:00:00	*0*	*0*	*0*	*0*	*0*	*0*
16:00:00	*161*	*552*	*150*	*863*	*18*	*1840*
17:00:00	*170*	*559*	*160*	*889*	*18*	*1957*
18:00:00	*154*	*518*	*157*	*829*	*9*	*1741*
Totals:	1270	4013	915	6198	94	12830

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*85*	*342*	*110*	*537*	*9*
9:00:00	*118*	*454*	*139*	*711*	*5*
10:00:00	*131*	*398*	*132*	*661*	*0*
12:00:00	*0*	*0*	*0*	*0*	*0*
13:00:00	*193*	*499*	*160*	*852*	*11*
14:00:00	*176*	*548*	*190*	*914*	*8*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*243*	*604*	*130*	*977*	*6*
17:00:00	*254*	*666*	*148*	*1068*	*8*
18:00:00	*206*	*557*	*149*	*912*	*3*
S Totals:	1406	4068	1158	6632	50

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	East/West Total Approaches
	Left	Thru	Right	Grand Total		
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*
8:00:00	*74*	*159*	*85*	*318*	*28*	*1177*
9:00:00	*97*	*231*	*123*	*451*	*18*	*1232*
10:00:00	*100*	*274*	*133*	*507*	*36*	*1220*
12:00:00	*0*	*0*	*0*	*0*	*0*	*0*
13:00:00	*164*	*594*	*245*	*1003*	*48*	*1960*
14:00:00	*151*	*572*	*249*	*972*	*45*	*1951*
15:00:00	*0*	*0*	*0*	*0*	*0*	*0*
16:00:00	*186*	*776*	*225*	*1187*	*39*	*2078*
17:00:00	*204*	*940*	*303*	*1447*	*38*	*2334*
18:00:00	*159*	*820*	*208*	*1187*	*55*	*2103*
Totals:	1135	4366	1571	7072	307	14055

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*187*	*549*	*123*	*859*	*10*
9:00:00	*147*	*480*	*154*	*781*	*6*
10:00:00	*150*	*399*	*164*	*713*	*13*
12:00:00	*0*	*0*	*0*	*0*	*0*
13:00:00	*220*	*570*	*167*	*957*	*22*
14:00:00	*244*	*549*	*186*	*979*	*19*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*196*	*516*	*179*	*891*	*9*
17:00:00	*198*	*505*	*184*	*887*	*17*
18:00:00	*223*	*516*	*177*	*916*	*17*
W Totals:	1565	4084	1334	6983	113

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*8:00*	*9:00*	*10:00*	*13:00*	*14:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*557*	*825*	*811*	*978*	*985*	*1056*	*1145*	*989*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 17-Sep-20 Site #: 2006800001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	13	13	40	40	4	4	0	0	1	1	0	0	1	1	3	3	0	0	0	0
7:30:00	33	20	93	53	13	9	0	0	1	0	0	0	2	1	6	3	1	1	0	0
7:45:00	55	22	164	71	23	10	0	0	1	0	0	0	5	3	7	1	1	0	2	2
8:00:00	87	32	296	132	35	12	0	0	2	1	1	1	5	0	10	3	1	0	5	3
8:15:00	117	30	413	117	42	7	0	0	3	1	1	0	9	4	11	1	3	2	5	0
8:30:00	149	32	530	117	56	14	0	0	5	2	2	1	12	3	14	3	4	1	7	2
8:45:00	192	43	656	126	69	13	0	0	7	2	3	1	14	2	15	1	5	1	8	1
9:00:00	235	43	805	149	92	23	1	1	10	3	4	1	17	3	15	0	9	4	10	2
9:15:00	270	35	920	115	114	22	1	0	11	1	4	0	22	5	16	1	9	0	10	0
9:30:00	307	37	1034	114	132	18	2	1	13	2	4	0	23	1	17	1	9	0	14	4
9:45:00	339	32	1135	101	147	15	2	0	15	2	5	1	26	3	18	1	9	0	18	4
10:00:00	377	38	1270	135	166	19	3	1	20	5	6	1	26	0	18	0	10	1	20	2
10:15:00	377	0	1270	0	166	0	3	0	20	0	6	0	26	0	18	0	10	0	20	0
12:00:00	377	0	1270	0	166	0	3	0	20	0	6	0	26	0	18	0	10	0	20	0
12:15:00	420	43	1387	117	199	33	3	0	21	1	7	1	28	2	19	1	11	1	21	1
12:30:00	464	44	1496	109	237	38	4	1	24	3	7	0	28	0	22	3	11	0	24	3
12:45:00	506	42	1637	141	263	26	5	1	24	0	7	0	30	2	23	1	11	0	34	10
13:00:00	551	45	1789	152	300	37	6	1	28	4	7	0	31	1	24	1	13	2	36	2
13:15:00	608	57	1928	139	328	28	6	0	29	1	7	0	32	1	24	0	13	0	38	2
13:30:00	654	46	2074	146	361	33	6	0	31	2	7	0	33	1	25	1	15	2	41	3
13:45:00	694	40	2190	116	397	36	7	1	32	1	11	4	35	2	26	1	15	0	45	4
14:00:00	740	46	2323	133	421	24	8	1	33	1	11	0	37	2	28	2	16	1	49	4
14:15:00	740	0	2323	0	421	0	8	0	33	0	11	0	37	0	28	0	16	0	49	0
15:00:00	740	0	2323	0	421	0	8	0	33	0	11	0	37	0	28	0	16	0	49	0
15:15:00	766	26	2459	136	464	43	8	0	33	0	11	0	40	3	28	0	18	2	53	4
15:30:00	809	43	2597	138	491	27	8	0	35	2	11	0	42	2	28	0	20	2	58	5
15:45:00	851	42	2722	125	519	28	8	0	35	0	11	0	45	3	29	1	20	0	60	2
16:00:00	891	40	2871	149	566	47	8	0	36	1	11	0	47	2	29	0	21	1	67	7
16:15:00	926	35	2996	125	610	44	8	0	36	0	11	0	48	1	32	3	21	0	73	6
16:30:00	967	41	3141	145	642	32	8	0	36	0	11	0	49	1	35	3	23	2	78	5
16:45:00	1006	39	3280	139	673	31	8	0	36	0	11	0	51	2	35	0	25	2	83	5
17:00:00	1055	49	3422	142	721	48	8	0	36	0	11	0	53	2	37	2	26	1	85	2
17:15:00	1087	32	3538	116	763	42	8	0	36	0	11	0	53	0	37	0	26	0	90	5
17:30:00	1133	46	3670	132	808	45	8	0	36	0	11	0	56	3	39	2	26	0	92	2
17:45:00	1160	27	3788	118	840	32	8	0	36	0	11	0	58	2	39	0	26	0	92	0
18:00:00	1202	42	3938	150	877	37	8	0	36	0	11	0	60	2	39	0	27	1	94	2
18:15:00	1202	0	3938	0	877	0	8	0	36	0	11	0	60	0	39	0	27	0	94	0
18:15:15	1202	0	3938	0	877	0	8	0	36	0	11	0	60	0	39	0	27	0	94	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 17-Sep-20 Site #: 2006800001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	9	9	24	24	14	14	0	0	0	0	0	0	1	1	6	6	2	2	7	7
7:30:00	27	18	54	30	35	21	0	0	0	0	0	0	3	2	9	3	5	3	15	8
7:45:00	42	15	91	37	50	15	0	0	0	0	0	0	3	0	12	3	7	2	19	4
8:00:00	68	26	142	51	74	24	0	0	0	0	0	0	6	3	17	5	11	4	28	9
8:15:00	84	16	197	55	96	22	0	0	0	0	0	0	7	1	22	5	12	1	31	3
8:30:00	107	23	246	49	124	28	0	0	1	1	0	0	8	1	25	3	14	2	38	7
8:45:00	134	27	299	53	156	32	0	0	2	1	1	1	10	2	30	5	16	2	43	5
9:00:00	158	24	354	55	189	33	2	2	2	0	1	0	11	1	34	4	18	2	46	3
9:15:00	181	23	399	45	219	30	2	0	2	0	1	0	12	1	40	6	20	2	56	10
9:30:00	208	27	453	54	246	27	2	0	4	2	2	1	12	0	43	3	22	2	63	7
9:45:00	235	27	526	73	272	26	3	1	6	2	2	0	13	1	47	4	22	0	71	8
10:00:00	254	19	608	82	314	42	3	0	6	0	3	1	14	1	50	3	24	2	82	11
10:15:00	254	0	608	0	314	0	3	0	6	0	3	0	14	0	50	0	24	0	82	0
12:00:00	254	0	608	0	314	0	3	0	6	0	3	0	14	0	50	0	24	0	82	0
12:15:00	294	40	745	137	369	55	4	1	7	1	3	0	14	0	53	3	25	1	97	15
12:30:00	336	42	890	145	429	60	5	1	8	1	3	0	16	2	55	2	26	1	103	6
12:45:00	370	34	1049	159	492	63	6	1	8	0	3	0	17	1	57	2	28	2	120	17
13:00:00	411	41	1188	139	551	59	6	0	9	1	4	1	18	1	61	4	31	3	130	10
13:15:00	451	40	1304	116	609	58	7	1	11	2	4	0	18	0	63	2	32	1	139	9
13:30:00	480	29	1452	148	677	68	7	0	12	1	4	0	19	1	66	3	34	2	155	16
13:45:00	519	39	1598	146	737	60	7	0	12	0	5	1	20	1	69	3	38	4	165	10
14:00:00	559	40	1740	142	790	53	7	0	14	2	5	0	20	0	76	7	40	2	175	10
14:15:00	559	0	1740	0	790	0	7	0	14	0	5	0	20	0	76	0	40	0	175	0
15:00:00	559	0	1740	0	790	0	7	0	14	0	5	0	20	0	76	0	40	0	175	0
15:15:00	609	50	1926	186	850	60	7	0	15	1	5	0	21	1	78	2	41	1	176	1
15:30:00	648	39	2103	177	902	52	7	0	15	0	5	0	22	1	81	3	44	3	187	11
15:45:00	693	45	2290	187	942	40	7	0	17	2	5	0	23	1	87	6	44	0	197	10
16:00:00	742	49	2498	208	1009	67	7	0	17	0	5	0	23	0	91	4	46	2	214	17
16:15:00	788	46	2709	211	1075	66	7	0	18	1	5	0	24	1	95	4	49	3	228	14
16:30:00	837	49	2920	211	1153	78	7	0	19	1	5	0	25	1	99	4	52	3	241	13
16:45:00	879	42	3167	247	1237	84	7	0	19	0	6	1	27	2	103	4	55	3	244	3
17:00:00	942	63	3419	252	1299	62	7	0	20	1	6	0	27	0	107	4	58	3	252	8
17:15:00	979	37	3662	243	1363	64	8	1	21	1	6	0	28	1	112	5	59	1	271	19
17:30:00	1033	54	3898	236	1417	54	8	0	23	2	6	0	29	1	116	4	60	1	282	11
17:45:00	1065	32	4080	182	1460	43	8	0	23	0	7	1	30	1	118	2	62	2	291	9
18:00:00	1097	32	4222	142	1499	39	8	0	24	1	7	0	30	0	120	2	65	3	307	16
18:15:00	1097	0	4222	0	1499	0	8	0	24	0	7	0	30	0	120	0	65	0	307	0
18:15:15	1097	0	4222	0	1499	0	8	0	24	0	7	0	30	0	120	0	65	0	307	0



Accu-Traffic Inc.

Count Date: 17-Sep-20 Site #: 2006800001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	12	12	70	70	27	27	1	1	0	0	0	0	0	0	1	1	1	1	1	1
7:30:00	36	24	141	71	51	24	1	0	1	1	0	0	1	1	3	2	2	1	2	1
7:45:00	51	15	225	84	77	26	2	1	3	2	0	0	3	2	4	1	3	1	5	3
8:00:00	79	28	332	107	107	30	2	0	3	0	0	0	4	1	7	3	3	0	9	4
8:15:00	103	24	449	117	142	35	2	0	3	0	0	0	4	0	9	2	4	1	9	0
8:30:00	133	30	578	129	169	27	4	2	4	1	0	0	4	0	13	4	5	1	11	2
8:45:00	159	26	662	84	207	38	4	0	4	0	0	0	7	3	14	1	8	3	13	2
9:00:00	191	32	776	114	240	33	4	0	5	1	0	0	8	1	15	1	9	1	14	1
9:15:00	218	27	873	97	263	23	5	1	7	2	0	0	11	3	16	1	10	1	14	0
9:30:00	246	28	974	101	294	31	5	0	7	0	0	0	12	1	18	2	11	1	14	0
9:45:00	281	35	1068	94	334	40	5	0	9	2	0	0	13	1	19	1	12	1	14	0
10:00:00	314	33	1163	95	366	32	5	0	11	2	2	2	15	2	20	1	13	1	14	0
10:15:00	314	0	1163	0	366	0	5	0	11	0	2	0	15	0	20	0	13	0	14	0
12:00:00	314	0	1163	0	366	0	5	0	11	0	2	0	15	0	20	0	13	0	14	0
12:15:00	356	42	1274	111	402	36	6	1	12	1	3	1	19	4	21	1	14	1	18	4
12:30:00	413	57	1408	134	451	49	6	0	12	0	3	0	21	2	25	4	15	1	19	1
12:45:00	449	36	1521	113	495	44	6	0	13	1	4	1	22	1	27	2	16	1	24	5
13:00:00	499	50	1653	132	521	26	6	0	13	0	4	0	22	0	27	0	16	0	25	1
13:15:00	540	41	1794	141	571	50	7	1	14	1	5	1	23	1	28	1	17	1	26	1
13:30:00	585	45	1927	133	607	36	7	0	18	4	6	1	24	1	29	1	18	1	29	3
13:45:00	633	48	2052	125	644	37	8	1	21	3	8	2	27	3	29	0	19	1	31	2
14:00:00	665	32	2189	137	702	58	8	0	23	2	9	1	30	3	29	0	20	1	33	2
14:15:00	665	0	2189	0	702	0	8	0	23	0	9	0	30	0	29	0	20	0	33	0
15:00:00	665	0	2189	0	702	0	8	0	23	0	9	0	30	0	29	0	20	0	33	0
15:15:00	728	63	2334	145	731	29	8	0	25	2	9	0	31	1	30	1	23	3	33	0
15:30:00	785	57	2480	146	757	26	8	0	26	1	10	1	33	2	30	0	25	2	34	1
15:45:00	844	59	2634	154	787	30	8	0	26	0	10	0	34	1	32	2	26	1	38	4
16:00:00	902	58	2784	150	823	36	9	1	27	1	11	1	35	1	34	2	27	1	39	1
16:15:00	967	65	2939	155	856	33	9	0	28	1	12	1	36	1	36	2	29	2	42	3
16:30:00	1028	61	3109	170	899	43	10	1	28	0	12	0	37	1	37	1	30	1	44	2
16:45:00	1084	56	3288	179	935	36	10	0	28	0	12	0	37	0	38	1	30	0	45	1
17:00:00	1152	68	3442	154	965	30	11	1	28	0	13	1	37	0	41	3	31	1	47	2
17:15:00	1209	57	3572	130	1010	45	11	0	29	1	14	1	37	0	41	0	32	1	48	1
17:30:00	1280	71	3740	168	1045	35	12	1	29	0	14	0	37	0	42	1	33	1	48	0
17:45:00	1314	34	3869	129	1078	33	12	0	29	0	14	0	38	1	43	1	34	1	48	0
18:00:00	1355	41	3995	126	1110	32	13	1	29	0	14	0	38	0	44	1	34	0	50	2
18:15:00	1355	0	3995	0	1110	0	13	0	29	0	14	0	38	0	44	0	34	0	50	0
18:15:15	1355	0	3995	0	1110	0	13	0	29	0	14	0	38	0	44	0	34	0	50	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 17-Sep-20 Site #: 2006800001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	30	30	78	78	15	15	3	3	1	1	1	1	0	0	4	4	0	0	0	0
7:30:00	82	52	214	136	44	29	3	0	3	2	1	0	1	1	6	2	0	0	0	0
7:45:00	139	57	381	167	77	33	3	0	3	0	3	2	3	2	14	8	1	1	4	4
8:00:00	178	39	528	147	118	41	5	2	4	1	3	0	4	1	17	3	2	1	10	6
8:15:00	221	43	638	110	157	39	5	0	7	3	3	0	5	1	26	9	3	1	12	2
8:30:00	251	30	744	106	188	31	5	0	7	0	4	1	5	0	28	2	5	2	13	1
8:45:00	295	44	851	107	227	39	5	0	9	2	4	0	5	0	34	6	6	1	14	1
9:00:00	322	27	980	129	265	38	5	0	10	1	4	0	7	2	39	5	8	2	16	2
9:15:00	366	44	1081	101	313	48	6	1	10	0	4	0	14	7	47	8	9	1	18	2
9:30:00	394	28	1171	90	349	36	7	1	11	1	4	0	16	2	51	4	9	0	22	4
9:45:00	435	41	1267	96	376	27	7	0	11	0	4	0	17	1	54	3	12	3	27	5
10:00:00	460	25	1359	92	423	47	7	0	12	1	5	1	17	0	57	3	13	1	29	2
10:15:00	460	0	1359	0	423	0	7	0	12	0	5	0	17	0	57	0	13	0	29	0
12:00:00	460	0	1359	0	423	0	7	0	12	0	5	0	17	0	57	0	13	0	29	0
12:15:00	521	61	1474	115	465	42	8	1	16	4	5	0	17	0	59	2	14	1	36	7
12:30:00	564	43	1626	152	506	41	8	0	19	3	5	0	20	3	63	4	16	2	36	0
12:45:00	616	52	1745	119	541	35	8	0	20	1	6	1	20	0	67	4	17	1	47	11
13:00:00	675	59	1908	163	583	42	9	1	20	0	6	0	20	0	70	3	19	2	51	4
13:15:00	717	42	2041	133	623	40	10	1	21	1	6	0	21	1	72	2	25	6	53	2
13:30:00	778	61	2164	123	671	48	11	1	21	0	7	1	23	2	75	3	25	0	58	5
13:45:00	847	69	2309	145	717	46	12	1	21	0	8	1	24	1	78	3	26	1	64	6
14:00:00	912	65	2445	136	755	38	12	0	22	1	11	3	24	0	80	2	28	2	70	6
14:15:00	912	0	2445	0	755	0	12	0	22	0	11	0	24	0	80	0	28	0	70	0
15:00:00	912	0	2445	0	755	0	12	0	22	0	11	0	24	0	80	0	28	0	70	0
15:15:00	972	60	2566	121	801	46	12	0	25	3	11	0	26	2	83	3	28	0	71	1
15:30:00	1001	29	2682	116	838	37	13	1	25	0	12	1	28	2	88	5	29	1	74	3
15:45:00	1053	52	2814	132	873	35	13	0	25	0	13	1	28	0	93	5	31	2	77	3
16:00:00	1101	48	2942	128	928	55	14	1	25	0	13	0	29	1	96	3	32	1	79	2
16:15:00	1159	58	3072	130	976	48	14	0	26	1	13	0	30	1	102	6	32	0	84	5
16:30:00	1207	48	3170	98	1017	41	14	0	26	0	14	1	30	0	108	6	32	0	88	4
16:45:00	1259	52	3308	138	1060	43	14	0	28	2	15	1	30	0	112	4	32	0	94	6
17:00:00	1298	39	3423	115	1110	50	14	0	30	2	15	0	30	0	115	3	32	0	96	2
17:15:00	1362	64	3565	142	1160	50	14	0	31	1	16	1	30	0	117	2	32	0	101	5
17:30:00	1415	53	3697	132	1199	39	14	0	31	0	16	0	31	1	120	3	32	0	101	0
17:45:00	1470	55	3818	121	1251	52	15	1	31	0	18	2	31	0	124	4	32	0	108	7
18:00:00	1519	49	3927	109	1284	33	15	0	31	0	18	0	31	0	126	2	32	0	113	5
18:15:00	1519	0	3927	0	1284	0	15	0	31	0	18	0	31	0	126	0	32	0	113	0
18:15:15	1519	0	3927	0	1284	0	15	0	31	0	18	0	31	0	126	0	32	0	113	0

200275-Brant @ Prospect

Morning Peak Diagram

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

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

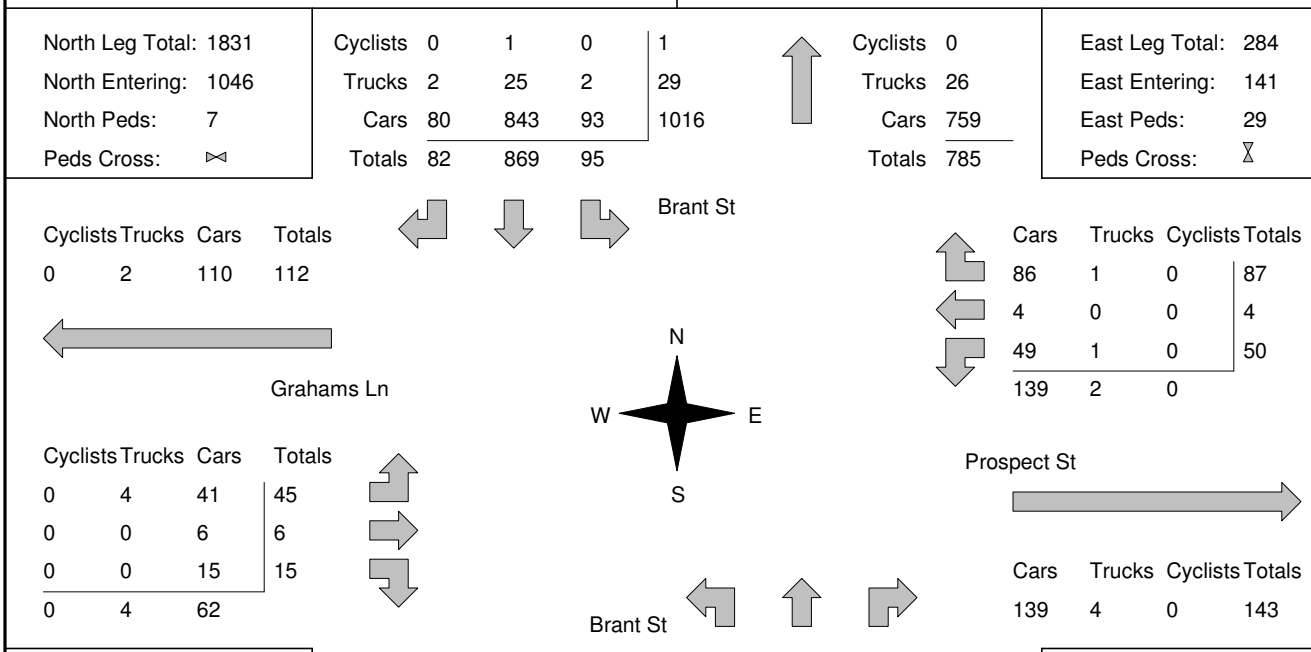
Municipality: Burlington
Site #: 2002750000
Intersection: Brant St & Prospect St
TFR File #: 1
Count date: 8-Nov-2022

Weather conditions:
Cloudy

Person(s) who counted:
Lara
Bonny

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

200275-Brant @ Prospect

Mid-day Peak Diagram

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

One Hour Peak
From: 12:30:00
To: 13:30:00

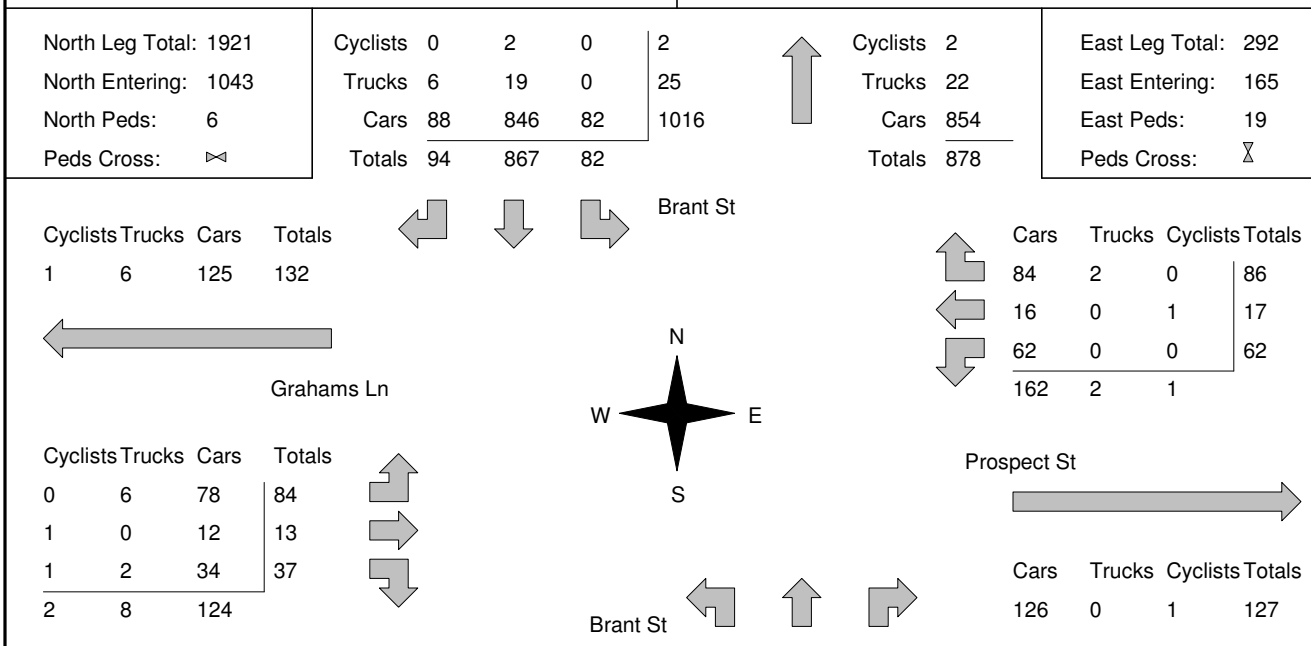
Municipality: Burlington
Site #: 2002750000
Intersection: Brant St & Prospect St
TFR File #: 1
Count date: 8-Nov-2022

Weather conditions:
Cloudy

Person(s) who counted:
Lara
Bonny

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

200275-Brant @ Prospect

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

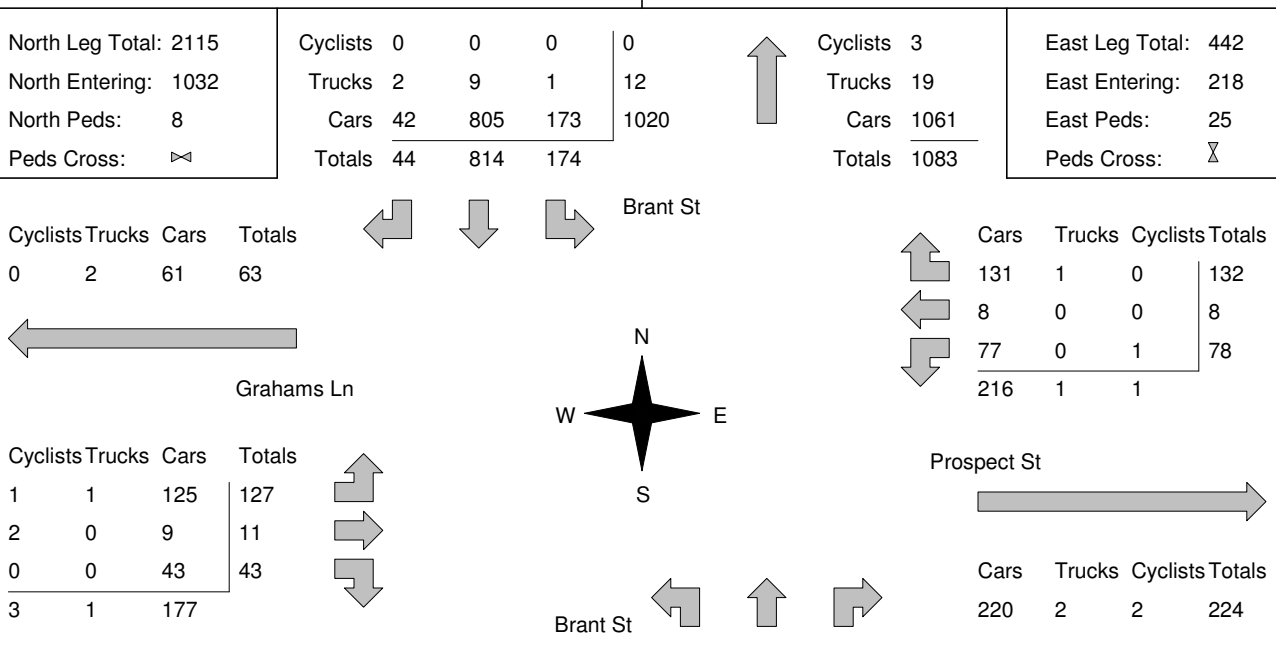
Municipality: Burlington
Site #: 2002750000
Intersection: Brant St & Prospect St
TFR File #: 1
Count date: 8-Nov-2022

Weather conditions:
Cloudy

Person(s) who counted:
Lara
Bonny

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

200275-Brant @ Prospect

Total Count Diagram

Municipality: Burlington
Site #: 2002750000
Intersection: Brant St & Prospect St
TFR File #: 1
Count date: 8-Nov-2022

Weather conditions:
Cloudy

Person(s) who counted:
Lara
Bonny

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total:	14158			
North Entering:	7338			
North Peds:	49			
Peds Cross:	⋈			
Cyclists	2	21	1	24
Trucks	29	122	11	162
Cars	540	5872	740	7152
Totals	571	6015	752	
Cyclists	17			
Trucks	167			
Cars	6636			
Totals	6820			
East Leg Total:	2386			
East Entering:	1277			
East Peds:	185			
Peds Cross:	⧖			

Brant St

Cyclists	Trucks	Cars	Totals
7	32	729	768

Cars	Trucks	Cyclists	Totals
710	12	0	722
52	1	4	57
493	4	1	498
1255	17	5	

Grahams Ln

N
W E
S

Cyclists	Trucks	Cars	Totals
1	29	626	656
3	1	62	66
6	6	207	219
10	36	895	

Prospect St

Cars	Trucks	Cyclists	Totals
1087	16	6	1109

Brant St

Peds Cross:	⧖			
West Peds:	100			
West Entering:	941			
West Leg Total:	1709			
Cars	6572			
Trucks	132			
Cyclists	28			
Totals	6732			
Cars	137	5300	285	5722
Trucks	2	126	4	132
Cyclists	1	16	2	19
Totals	140	5442	291	
Peds Cross:	⋈			
South Peds:	69			
South Entering:	5873			
South Leg Total:	12605			

Comments

200275-Brant @ Prospect
Traffic Count Summary

Intersection: Brant St & Prospect St | **Count Date:** 8-Nov-2022 | **Municipality:** Burlington

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	31	429	75	535	3	1065
9:00:00	95	869	82	1046	7	1767
11:00:00	0	0	0	0	0	0
12:00:00	78	649	75	802	4	1510
13:00:00	71	849	95	1015	3	1796
14:00:00	94	769	81	944	9	1645
15:00:00	0	0	0	0	0	0
16:00:00	114	842	64	1020	6	1852
17:00:00	123	772	54	949	5	1835
18:00:00	146	836	45	1027	12	1741
Totals:	752	6015	571	7338	49	13211

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	9	501	20	530	3
9:00:00	26	653	42	721	11
11:00:00	0	0	0	0	0
12:00:00	25	647	36	708	11
13:00:00	23	727	31	781	7
14:00:00	23	651	27	701	9
15:00:00	0	0	0	0	0
16:00:00	11	764	57	832	8
17:00:00	15	829	42	886	7
18:00:00	8	670	36	714	13
Totals:	140	5442	291	5873	69

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	22	3	68	93	18	123
9:00:00	50	4	87	141	29	207
11:00:00	0	0	0	0	0	0
12:00:00	69	6	60	135	13	249
13:00:00	48	16	81	145	23	265
14:00:00	59	6	75	140	21	314
15:00:00	0	0	0	0	0	0
16:00:00	81	8	117	206	28	315
17:00:00	89	9	144	242	28	394
18:00:00	80	5	90	175	25	351
Totals:	498	57	722	1277	185	2218

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	27	2	1	30	9
9:00:00	45	6	15	66	18
11:00:00	0	0	0	0	0
12:00:00	76	11	27	114	15
13:00:00	71	16	33	120	14
14:00:00	136	6	32	174	11
15:00:00	0	0	0	0	0
16:00:00	74	7	28	109	8
17:00:00	104	9	39	152	13
18:00:00	123	9	44	176	12
Totals:	656	66	219	941	100

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	58	119	171	145	219	177	214	237

200274 -Brant St @ Ghent Ave

Morning Peak Diagram

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

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

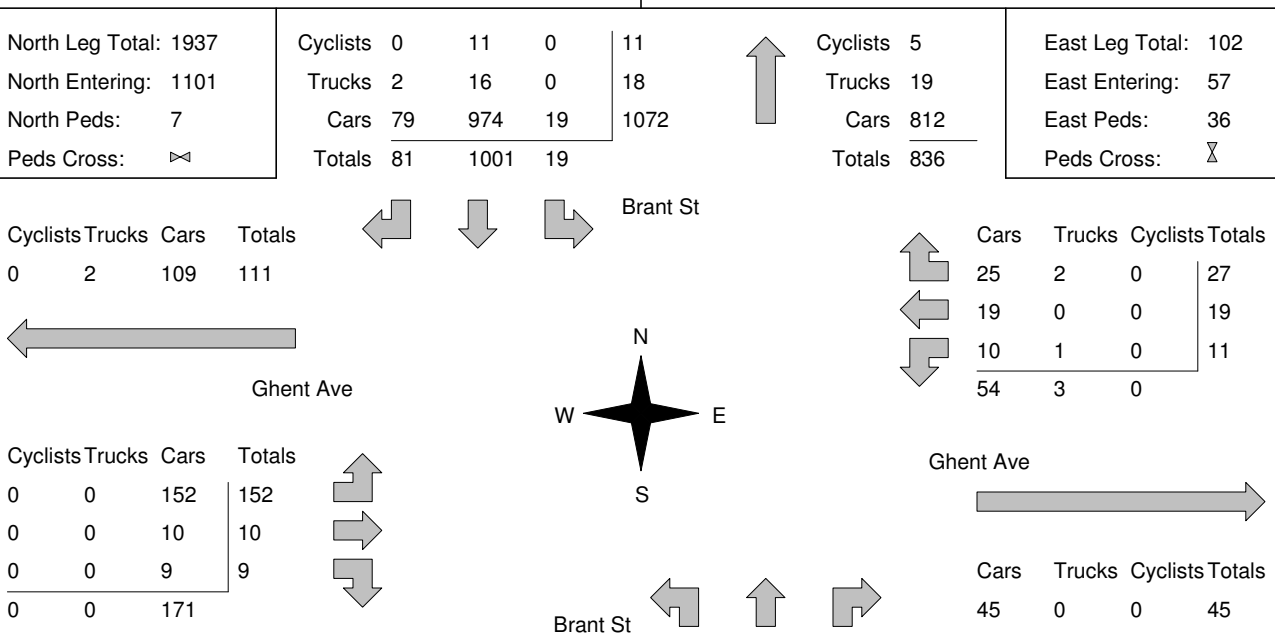
Municipality: Burlington
Site #: 2002740000
Intersection: Brant St & Ghent Ave
TFR File #: 1
Count date: 9-Jun-2022

Weather conditions:
Sunny

Person(s) who counted:
Bonny
Lara

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

200274 -Brant St @ Ghent Ave

Mid-day Peak Diagram

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

One Hour Peak
From: 11:30:00
To: 12:30:00

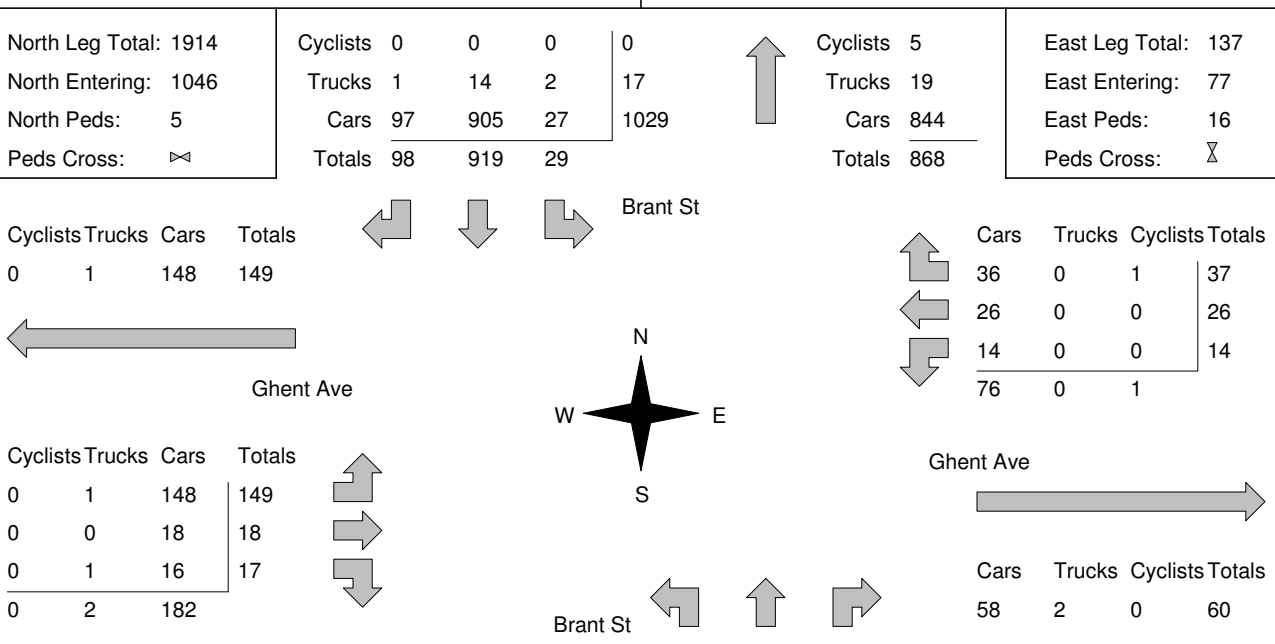
Municipality: Burlington
Site #: 2002740000
Intersection: Brant St & Ghent Ave
TFR File #: 1
Count date: 9-Jun-2022

Weather conditions:
Sunny

Person(s) who counted:
Bonny
Lara

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

200274 -Brant St @ Ghent Ave

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Burlington
Site #: 2002740000
Intersection: Brant St & Ghent Ave
TFR File #: 1
Count date: 9-Jun-2022

Weather conditions:
Sunny

Person(s) who counted:
Bonny
Lara

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total: 2035
North Entering: 1126
North Peds: 5
Peds Cross: ⋈

Cyclists	0	3	0	3
Trucks	0	7	3	10
Cars	120	953	40	1113
Totals	120	963	43	

Cyclists	4
Trucks	6
Cars	899
Totals	909

East Leg Total: 155
East Entering: 87
East Peds: 29
Peds Cross: ⧖

Brant St

Cyclists	Trucks	Cars	Totals
0	0	165	165

Ghent Ave

Cyclists	Trucks	Cars	Totals
0	0	159	159
0	0	14	14
0	0	18	18
0	0	191	

Cars	Trucks	Cyclists	Totals
37	0	1	38
34	0	0	34
14	0	1	15
85	0	2	

N
W E
S

Ghent Ave

Cars	Trucks	Cyclists	Totals
65	3	0	68

Brant St

Peds Cross: ⧖
West Peds: 20
West Entering: 191
West Leg Total: 356

Cars	985
Trucks	7
Cyclists	4
Totals	996

Cars	11	703	11	725
Trucks	0	6	0	6
Cyclists	0	3	0	3
Totals	11	712	11	

Peds Cross: ⋈
South Peds: 12
South Entering: 734
South Leg Total: 1730

Comments

200274 -Brant St @ Ghent Ave

Total Count Diagram

Municipality: Burlington
Site #: 2002740000
Intersection: Brant St & Ghent Ave
TFR File #: 1
Count date: 9-Jun-2022

Weather conditions:
Sunny

Person(s) who counted:
Bonny
Lara

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total: 14050
North Entering: 7610
North Peds: 46
Peds Cross: ⋈

Cyclists	3	34	0	37
Trucks	6	117	9	132
Cars	795	6427	219	7441
Totals	804	6578	228	

Cyclists	29
Trucks	133
Cars	6278
Totals	6440

East Leg Total: 975
East Entering: 519
East Peds: 213
Peds Cross: ⧖

Brant St

Cyclists	Trucks	Cars	Totals
3	10	1089	1102

Cars	Trucks	Cyclists	Totals
249	4	5	258
176	1	0	177
81	2	1	84
506	7	6	

Ghent Ave

N
W E
S

Cyclists	Trucks	Cars	Totals
0	11	1148	1159
3	4	101	108
0	3	123	126
3	18	1372	

Ghent Ave

Cars	Trucks	Cyclists	Totals
436	16	4	456

Brant St

Peds Cross: ⧖
West Peds: 133
West Entering: 1393
West Leg Total: 2495

Cars	6631
Trucks	122
Cyclists	35
Totals	6788

Cars	118	4881	116	5115
Trucks	3	118	3	124
Cyclists	0	24	1	25
Totals	121	5023	120	

Peds Cross: ⋈
South Peds: 103
South Entering: 5264
South Leg Total: 12052

Comments

200274 -Brant St @ Ghent Ave
Traffic Count Summary

Intersection: Brant St & Ghent Ave | **Count Date:** 9-Jun-2022 | **Municipality:** Burlington

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	7	363	33	403	2	836
9:00:00	19	1001	81	1101	7	1785
11:00:00	0	0	0	0	0	0
12:00:00	20	911	88	1019	2	1689
13:00:00	41	854	109	1004	7	1708
14:00:00	34	876	108	1018	7	1633
15:00:00	0	0	0	0	0	0
16:00:00	43	700	146	889	10	1695
17:00:00	31	908	120	1059	6	1760
18:00:00	33	965	119	1117	5	1768
Totals:	228	6578	804	7610	46	12874

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	3	419	11	433	10
9:00:00	11	657	16	684	15
11:00:00	0	0	0	0	0
12:00:00	23	637	10	670	12
13:00:00	23	663	18	704	12
14:00:00	15	581	19	615	9
15:00:00	0	0	0	0	0
16:00:00	18	769	19	806	21
17:00:00	15	675	11	701	18
18:00:00	13	622	16	651	6
Totals:	121	5023	120	5264	103

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	5	3	30	38	11	142
9:00:00	11	19	27	57	36	228
11:00:00	0	0	0	0	0	0
12:00:00	6	19	32	57	18	231
13:00:00	18	27	37	82	22	273
14:00:00	6	16	25	47	22	239
15:00:00	0	0	0	0	0	0
16:00:00	10	32	33	75	46	271
17:00:00	9	29	35	73	29	257
18:00:00	19	32	39	90	29	271
Totals:	84	177	258	519	213	1912

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	89	12	3	104	9
9:00:00	152	10	9	171	21
11:00:00	0	0	0	0	0
12:00:00	148	14	12	174	15
13:00:00	151	18	22	191	11
14:00:00	152	16	24	192	14
15:00:00	0	0	0	0	0
16:00:00	152	16	28	196	27
17:00:00	161	13	10	184	17
18:00:00	154	9	18	181	19
Totals:	1159	108	126	1393	133

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	118	204	187	215	190	225	223	216

Brant St @ Olga Dr

Morning Peak Diagram

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

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

Municipality: Burlington
Site #: 0000200273
Intersection: Brant St & Olga Dr
TFR File #: 5
Count date: 17-Sep-2015

Weather conditions:
Sunny/Dry

Person(s) who counted:
Bronek

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

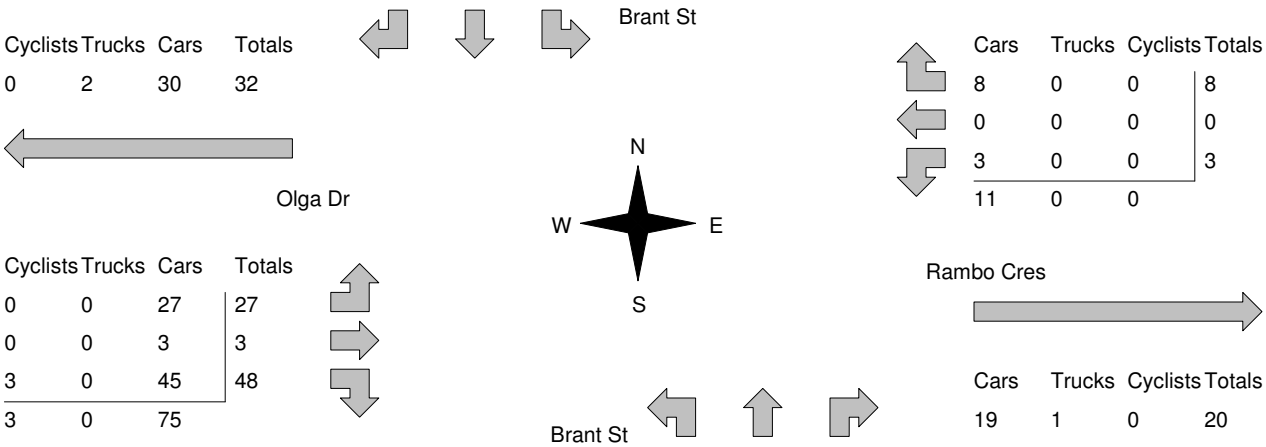
Major Road: Brant St runs N/S

North Leg Total: 1377
North Entering: 717
North Peds: 0
Peds Cross: ⋈

Cyclists	0	11	0	11
Trucks	0	23	1	24
Cars	11	657	14	682
Totals	11	691	15	

Cyclists	6
Trucks	19
Cars	635
Totals	660

East Leg Total: 31
East Entering: 11
East Peds: 56
Peds Cross: ⧖



Cyclists	Trucks	Cars	Totals
0	2	30	32

Cars	Trucks	Cyclists	Totals
8	0	0	8
0	0	0	0
3	0	0	3
11	0	0	

Cyclists	Trucks	Cars	Totals
0	0	27	27
0	0	3	3
3	0	45	48
3	0	75	

Cars	Trucks	Cyclists	Totals
19	1	0	20

Peds Cross: ⧖
West Peds: 64
West Entering: 78
West Leg Total: 110

Cars	705			
Trucks	23			
Cyclists	14			
Totals	742			

Cars	19	600	2	621
Trucks	2	19	0	21
Cyclists	0	6	0	6
Totals	21	625	2	

Peds Cross: ⋈
South Peds: 0
South Entering: 648
South Leg Total: 1390

Comments

Brant St @ Olga Dr

Mid-day Peak Diagram

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

One Hour Peak
From: 11:30:00
To: 12:30:00

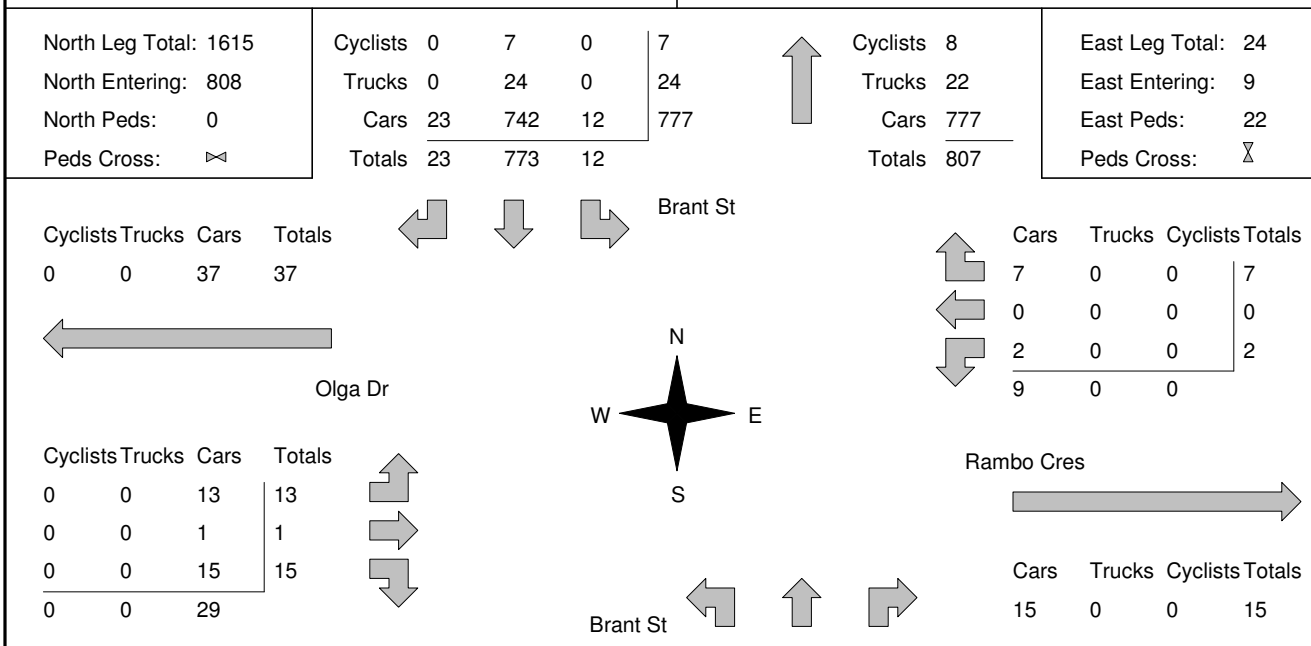
Municipality: Burlington
Site #: 0000200273
Intersection: Brant St & Olga Dr
TFR File #: 5
Count date: 17-Sep-2015

Weather conditions:
Sunny/Dry

Person(s) who counted:
Bronek

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

Major Road: Brant St runs N/S



Comments

Brant St @ Olga Dr

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

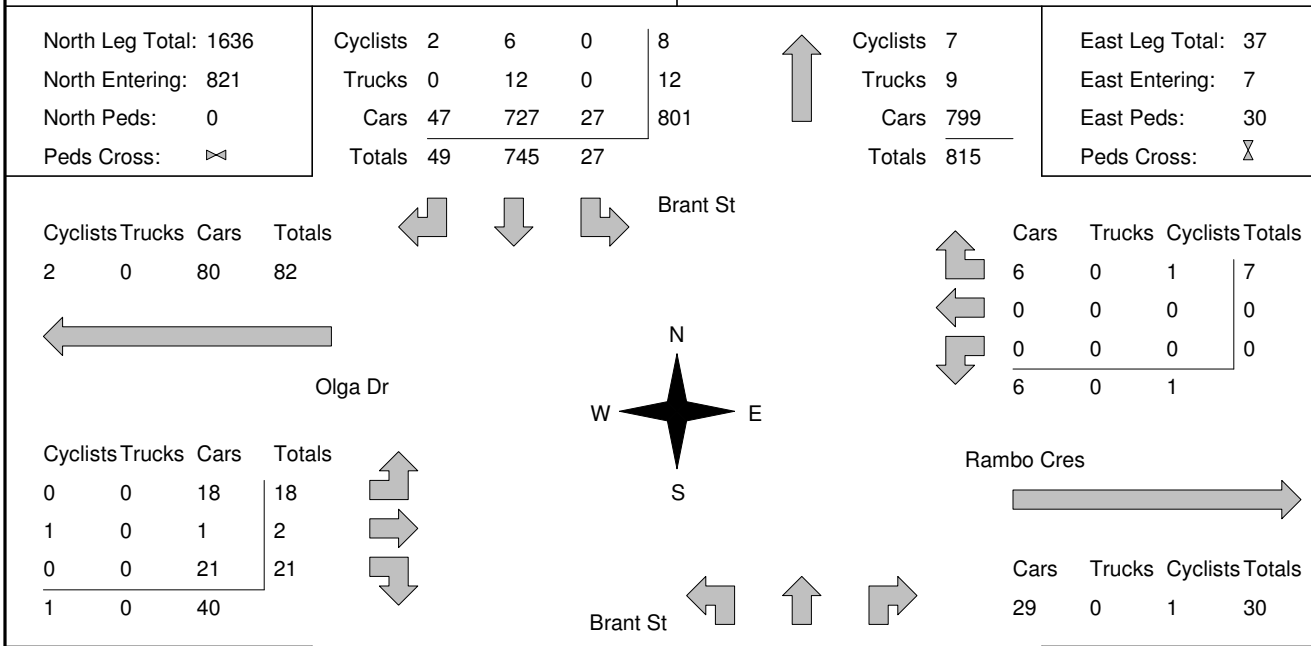
Municipality: Burlington
Site #: 0000200273
Intersection: Brant St & Olga Dr
TFR File #: 5
Count date: 17-Sep-2015

Weather conditions:
Sunny/Dry

Person(s) who counted:
Bronek

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

Major Road: Brant St runs N/S



Comments

Brant St @ Olga Dr

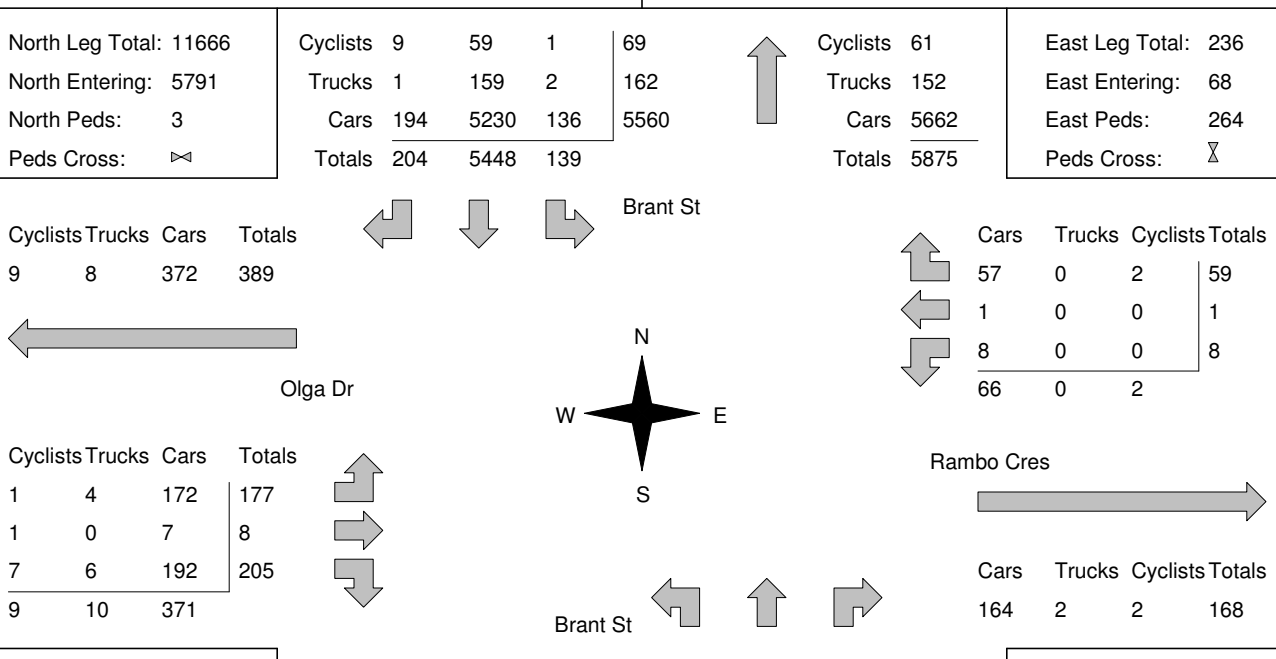
Total Count Diagram

Municipality: Burlington
Site #: 0000200273
Intersection: Brant St & Olga Dr
TFR File #: 5
Count date: 17-Sep-2015

Weather conditions: Sunny/Dry
Person(s) who counted: Bronek

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

Major Road: Brant St runs N/S



Comments

Brant St @ Olga Dr

Annual Average Daily Traffic Diagram

Total Factor = Monthly Factor(1.00) x Daily Factor(0.91) x 24 Hour Factor(1.85) = 1.683500

Municipality: Burlington
Site #: 0000200273
Intersection: Brant St & Olga Dr
TFR File #: 5
Count date: 17-Sep-2015

Weather conditions: Sunny/Dry
Person(s) who counted: Bronek

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

Major Road: Brant St runs N/S

North Leg Total: 19640
North Entering: 9749
North Peds: 5
Peds Cross: ⋈

Cyclists	15	99	2	116
Trucks	2	268	3	273
Cars	327	8805	229	9360
Totals	343	9172	234	

Cyclists	103
Trucks	256
Cars	9532
Totals	9891

East Leg Total: 397
East Entering: 114
East Peds: 444
Peds Cross: ⧖

Brant St

Cyclists	Trucks	Cars	Totals
15	13	626	655

Cars	Trucks	Cyclists	Totals
96	0	3	99
2	0	0	2
13	0	0	13
111	0	3	

Olga Dr

N
W E
S

Cyclists	Trucks	Cars	Totals
2	7	290	298
2	0	12	13
12	10	323	345
15	17	625	

Rambo Cres

Cars	Trucks	Cyclists	Totals
276	3	3	283

Brant St

Peds Cross: ⧖
West Peds: 493
West Entering: 657
West Leg Total: 1311

Cars	9141
Trucks	278
Cyclists	111
Totals	9530

Cars	298	9146	35	9480
Trucks	12	249	0	261
Cyclists	0	98	0	98
Totals	310	9493	35	

Peds Cross: ⋈
South Peds: 0
South Entering: 9838
South Leg Total: 19369

Comments

200225-Brant St @ Blairholm Ave

Morning Peak Diagram

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

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

Municipality: Burlington
Site #: 2002250000
Intersection: Brant St & Blairholm Ave
TFR File #: 1
Count date: 20-Sep-2022

Weather conditions:
Sunny

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total: 1325
North Entering: 658
North Peds: 15
Peds Cross: ⋈

Cyclists	0	22	0	22
Trucks	0	51	4	55
Cars	0	539	42	581
Totals	0	612	46	

Cyclists	5
Trucks	78
Cars	584
Totals	667

East Leg Total: 227
East Entering: 159
East Peds: 60
Peds Cross: ⧖

Brant St

Cyclists	Trucks	Cars	Totals
0	0	0	0

One Way Parking

Cars	Trucks	Cyclists	Totals
115	9	0	124
0	0	0	0
31	4	0	35
146	13	0	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	2	0	2
1	0	0	1
0	0	1	1
1	2	1	

Blairholm Ave

Cars	Trucks	Cyclists	Totals
60	6	2	68

Brant St

Peds Cross: ⧖
West Peds: 119
West Entering: 4
West Leg Total: 4

Cars	571
Trucks	55
Cyclists	22
Totals	648

Cars	0	469	18	487
Trucks	0	67	2	69
Cyclists	0	5	1	6
Totals	0	541	21	

Peds Cross: ⋈
South Peds: 63
South Entering: 562
South Leg Total: 1210

Comments

200225-Brant St @ Blairholm Ave

Mid-day Peak Diagram

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

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

Municipality: Burlington
Site #: 2002250000
Intersection: Brant St & Blairholm Ave
TFR File #: 1
Count date: 20-Sep-2022

Weather conditions:
Sunny

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total: 1373
North Entering: 673
North Peds: 5
Peds Cross: ⋈

Cyclists	0	9	0	9
Trucks	0	66	8	74
Cars	0	558	32	590
Totals	0	633	40	

Cyclists	6
Trucks	75
Cars	619
Totals	700

East Leg Total: 118
East Entering: 62
East Peds: 42
Peds Cross: ⧖

Brant St

Cyclists	Trucks	Cars	Totals
0	0	0	0

One Way Parking

Cars	Trucks	Cyclists	Totals
45	6	0	51
0	0	0	0
8	3	0	11
53	9	0	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	2	23	25
0	0	3	3
0	1	12	13
0	3	38	

Blairholm Ave

Cars	Trucks	Cyclists	Totals
45	11	0	56

Brant St

Peds Cross: ⧖
West Peds: 18
West Entering: 41
West Leg Total: 41

Cars	578
Trucks	70
Cyclists	9
Totals	657

Cars	0	551	10	561
Trucks	0	67	3	70
Cyclists	0	6	0	6
Totals	0	624	13	

Peds Cross: ⋈
South Peds: 10
South Entering: 637
South Leg Total: 1294

Comments

200225-Brant St @ Blairholm Ave

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

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

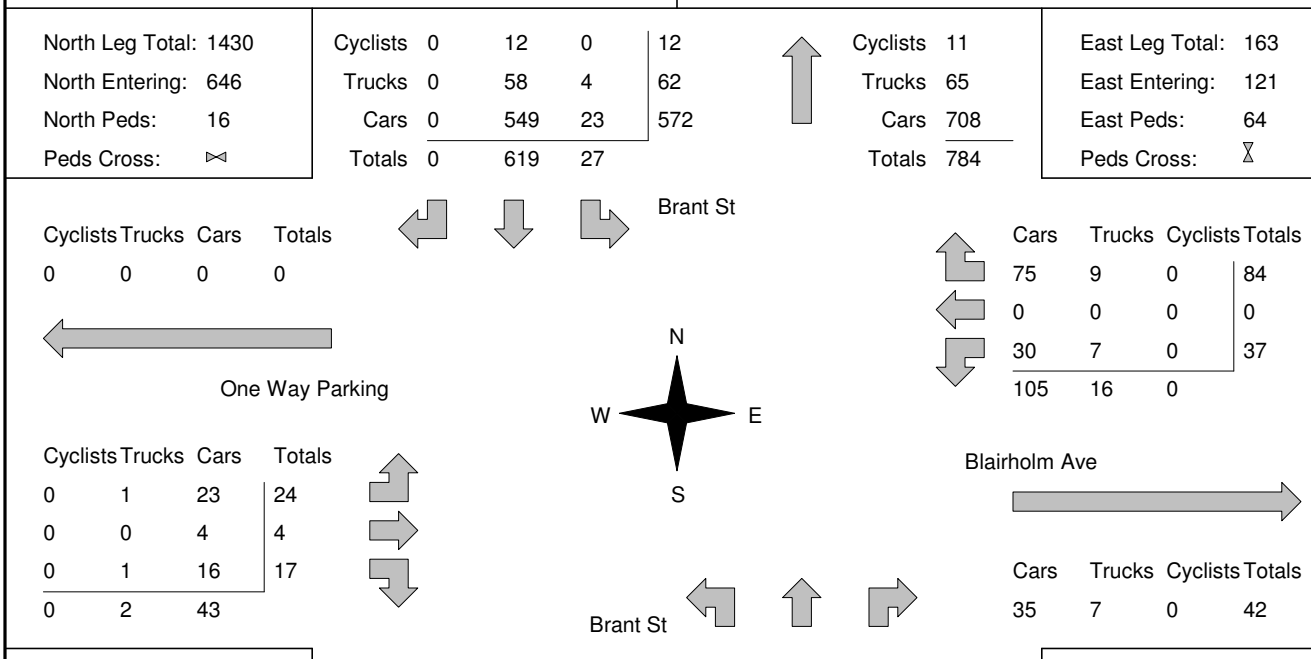
Municipality: Burlington
Site #: 2002250000
Intersection: Brant St & Blairholm Ave
TFR File #: 1
Count date: 20-Sep-2022

Weather conditions:
Sunny

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

200225-Brant St @ Blairholm Ave

Total Count Diagram

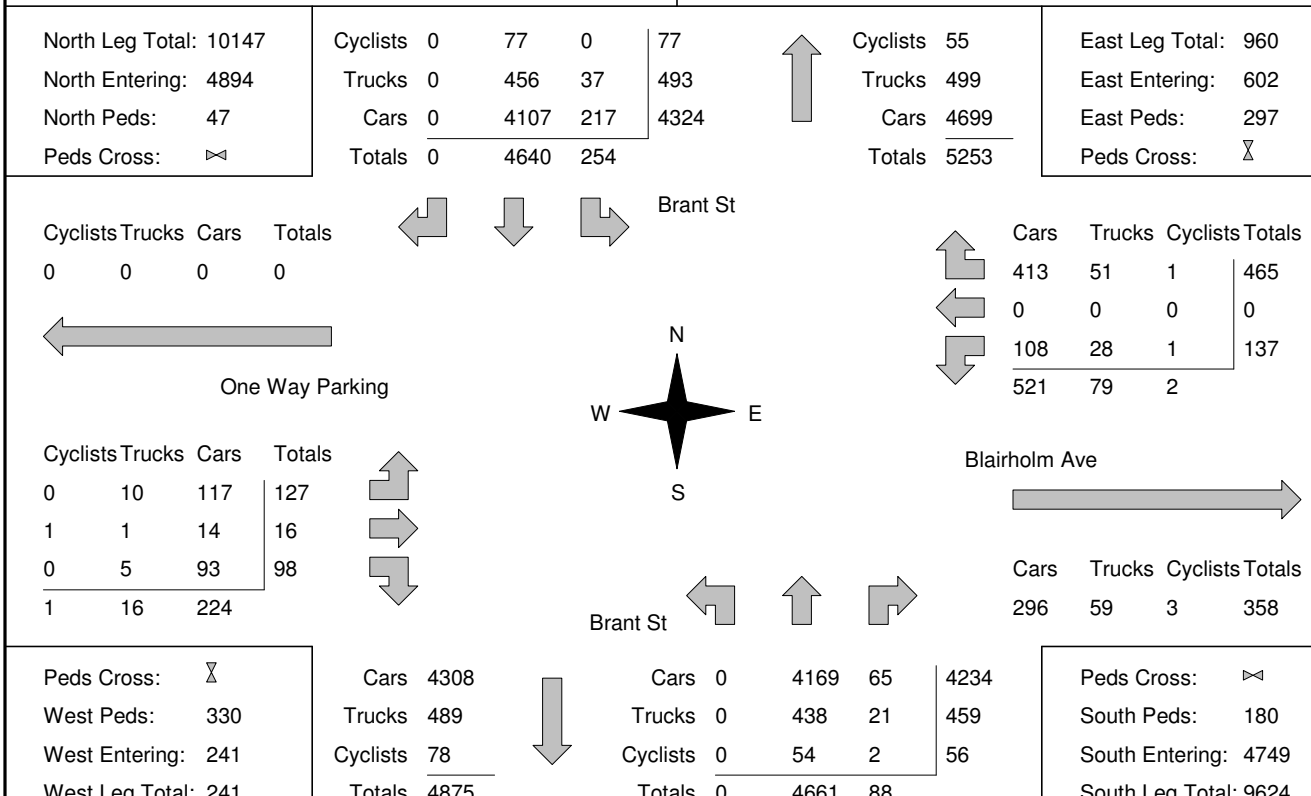
Municipality: Burlington
Site #: 2002250000
Intersection: Brant St & Blairholm Ave
TFR File #: 1
Count date: 20-Sep-2022

Weather conditions:
Sunny

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

200225-Brant St @ Blairholm Ave
Traffic Count Summary

Intersection: Brant St & Blairholm Ave | **Count Date:** 20-Sep-2022 | **Municipality:** Burlington

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	16	344	0	360	1	750
9:00:00	47	599	0	646	14	1201
11:00:00	0	0	0	0	0	0
12:00:00	30	576	0	606	4	1187
13:00:00	35	603	0	638	2	1293
14:00:00	28	588	0	616	3	1203
15:00:00	0	0	0	0	0	0
16:00:00	27	619	0	646	16	1333
17:00:00	33	634	0	667	3	1342
18:00:00	38	677	0	715	4	1334
Totals:	254	4640	0	4894	47	9643

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	383	7	390	8
9:00:00	0	536	19	555	64
11:00:00	0	0	0	0	0
12:00:00	0	573	8	581	15
13:00:00	0	641	14	655	14
14:00:00	0	581	6	587	17
15:00:00	0	0	0	0	0
16:00:00	0	676	11	687	24
17:00:00	0	661	14	675	23
18:00:00	0	610	9	619	15
Totals:	0	4661	88	4749	180

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	9	0	41	50	20	50
9:00:00	35	0	121	156	60	161
11:00:00	0	0	0	0	0	0
12:00:00	14	0	46	60	33	112
13:00:00	11	0	47	58	42	91
14:00:00	14	0	48	62	20	99
15:00:00	0	0	0	0	0	0
16:00:00	37	0	84	121	64	166
17:00:00	9	0	38	47	24	84
18:00:00	8	0	40	48	34	80
Totals:	137	0	465	602	297	843

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	23
9:00:00	3	1	1	5	113
11:00:00	0	0	0	0	0
12:00:00	36	3	13	52	25
13:00:00	17	3	13	33	14
14:00:00	17	1	19	37	27
15:00:00	0	0	0	0	0
16:00:00	24	4	17	45	79
17:00:00	20	0	17	37	23
18:00:00	10	4	18	32	26
Totals:	127	16	98	241	330

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	18	117	72	47	52	105	55	41

Brant St @ Victoria Ave

Morning Peak Diagram

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

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

Municipality: Burlington
Site #: 0000000003
Intersection: Brant St & Victoria Ave
TFR File #: 3
Count date: 19-Oct-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total:	1250			
North Entering:	616			
North Peds:	192			
Peds Cross:	⋈			
Heavys	2	14	0	16
Trucks	1	6	1	8
Cars	147	408	37	592
Totals	150	428	38	
Heavys	13			
Trucks	1			
Cars	620			
Totals	634			
East Leg Total:	172			
East Entering:	107			
East Peds:	105			
Peds Cross:	⧖			

Brant St

Heavys	Trucks	Cars	Totals
4	1	196	201

Cars	Trucks	Heavys	Totals
51	0	3	54
38	0	2	40
12	1	0	13
101	1	5	

Baldwin St

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	68	68
0	0	13	13
0	0	24	24
0	0	105	

Victoria Ave

Cars	Trucks	Heavys	Totals
64	1	0	65

Brant St

Peds Cross:	⧖			
West Peds:	54			
West Entering:	105			
West Leg Total:	306			
Cars	444			
Trucks	7			
Heavys	14			
Totals	465			
Cars	11	501	14	526
Trucks	0	1	0	1
Heavys	0	10	0	10
Totals	11	512	14	
Peds Cross:	⋈			
South Peds:	74			
South Entering:	537			
South Leg Total:	1002			

Comments

Brant St @ Victoria Ave

Mid-day Peak Diagram

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

One Hour Peak
From: 12:00:00
To: 13:00:00

Municipality: Burlington
Site #: 0000000003
Intersection: Brant St & Victoria Ave
TFR File #: 3
Count date: 19-Oct-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total: 1189
North Entering: 593
North Peds: 26
Peds Cross: ⋈

Heavys	1	13	0	14
Trucks	0	4	0	4
Cars	28	500	47	575
Totals	29	517	47	

Heavys	7
Trucks	12
Cars	577
Totals	596

East Leg Total: 122
East Entering: 65
East Peds: 65
Peds Cross: ⧖

Heavys	Trucks	Cars	Totals
1	0	42	43

Brant St

Cars	Trucks	Heavys	Totals
46	1	1	48
7	0	0	7
10	0	0	10
63	1	1	

Baldwin St

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	22	23
0	0	4	4
0	0	8	8
1	0	34	

Victoria Ave

Cars	Trucks	Heavys	Totals
57	0	0	57

Brant St

Peds Cross: ⧖
West Peds: 24
West Entering: 35
West Leg Total: 78

Cars	518
Trucks	4
Heavys	13
Totals	535

Cars	7	509	6	522
Trucks	0	11	0	11
Heavys	0	5	0	5
Totals	7	525	6	

Peds Cross: ⋈
South Peds: 45
South Entering: 538
South Leg Total: 1073

Comments

Brant St @ Victoria Ave

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

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

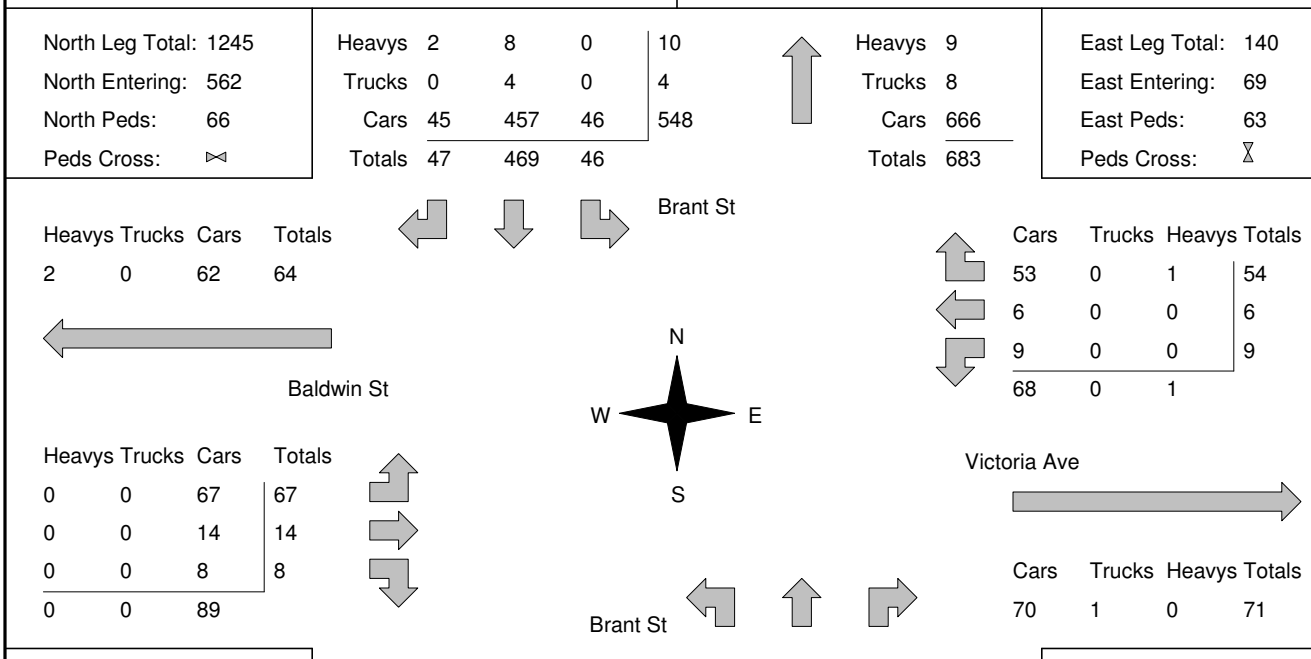
Municipality: Burlington
Site #: 0000000003
Intersection: Brant St & Victoria Ave
TFR File #: 3
Count date: 19-Oct-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

Brant St @ Victoria Ave

Total Count Diagram

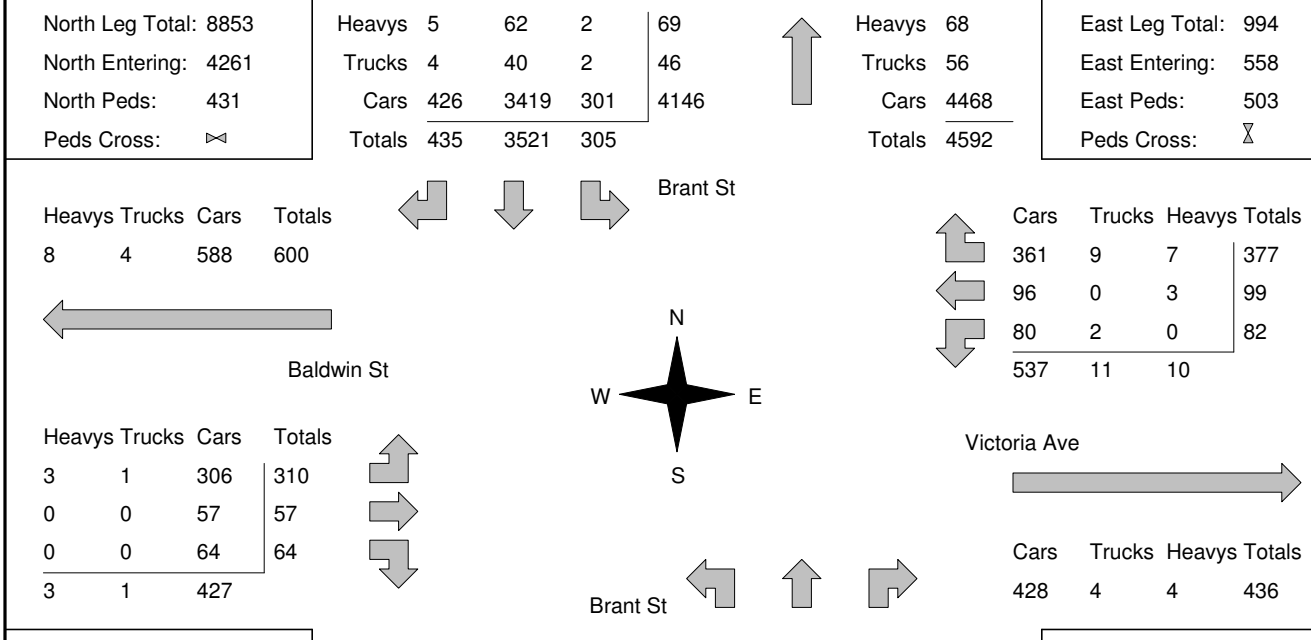
Municipality: Burlington
Site #: 0000000003
Intersection: Brant St & Victoria Ave
TFR File #: 3
Count date: 19-Oct-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Brant St @ Fairview St	151	1	ACS/3	172.22.66.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		MA
1	2016	12	6	Timing Changed(optimization) Amber & Allred changed as per OTM Book 12	

PHASE DESCRIPTION

Ph1	SBLT- Brant Street	Ph5	NBLT- Brant Street
Ph2	NB- Brant Street	Ph6	SB- Brant Street
Ph3	WBLT-Fairview Street	Ph7	EBLT-Fairview Street
Ph4	EB-Fairview Street	Ph8	WB-Fairview Street

PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use	X	X	X	X	X	X	X	X
Exclusive PED								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green	7	8	7	8	7	8	7	8
Walk		7		7		7		7
Ped. Clearance		17		17		17		17
Pedestrian Carry Over								
Vehicle Extension	3	3	3	3	3	3	3	3
MAX 1	15	40	15	35	15	40	15	35
MAX 2	15	40	15	35	15	40	15	35
Yellow Change	3	3.3	3	3.7	3	3.3	3	3.7
Red Clearance	1	3.2	1	2.7	1	3.2	1	2.7
Phase Minimum:	12	31.5	12	31.4	12	31.5	12	31.4

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector								
Vehicle Recall								
Pedestrian Recall		X				X		
MAX Recall		X				X		
Min Recall								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN *** - 3 - 2, - 3 - 3**

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	110	107	1	1	18	36	12	44	12	42	21	35
2	110	70	1	2	19	34	12	45	19	34	17	40
3	120	89	1	3	22	36	20	42	22	36	13	49
4	100	0	1	4	15	36	15	34	15	36	15	34
5	120	0	1	5	17	37	19	47	17	37	14	52
10	0	0	1	10	0	0	0	0	0	0	0	0

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, -5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	06:00	1	1
1	1	2	09:00	2	1
1	1	3	15:15	3	1
1	1	5	17:15	5	1
1	1	3	17:30	3	1
1	1	5	18:00	5	1
1	1	3	18:15	3	1
1	1	2	19:00	2	1
1	1	10	21:30	254	1
2	2	4	07:00	4	1
2	2	1	08:30	1	1
2	2	4	17:30	4	1
2	2	10	23:00	254	1
3	3	4	07:30	4	1
3	3	1	12:00	1	1
3	3	4	17:30	4	1
3	3	10	22:00	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

Special Programming:

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Sum of 1&2		Sum of 3&4		Calculated	
				Total 1-4	Total 5-8
				Actual	Actual
1&2	5&6	3&4	7&8		
54	54	56	56	110	110
53	53	57	57	110	110
58	58	62	62	120	120
51	51	49	49	100	100
54	54	66	66	120	120
0	0	0	0	0	0
0	0	0	0	0	0

Intersection Name:	TS ID:	Group NO:	IP address:
Brant St @ Prospect Street	141		172.22.65.2

Controller Make:	Model:	Firmware Rev. No:	
Econolite	ACS/3		

Type of Operation 4 Phase Semi-Actuated

Revision

NO	Date Y	Date M	Date D	Description	Prepared by:
1	2014	11	17	Implement timings in Centracs	MA

*- Start From Main Menu

PHASE DESCRIPTION

Ph1	SB LT - Brant St.	Ph5	
Ph2	NB/SB - Brant St.	PH6	
Ph3		Ph7	
Ph4	EB/WB - Prospect Street	Ph8	

CONFIGURATION (PHASE SEQ): PHASE IN USE /EXCLUSIVE PED (MM) * - 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use :	X	X		X				
Exclusive PED :								

CONTROLLER: CONTROLLER TIMING DATA - VEHICLE TIMINGS (4 available) * - 2 - 1

Timing Plan: 1

Phase:	1	2	3	4	5	6	7	8
Minimum Green :	6	8		8				
Conditional Service Min. Green :								
Walk :		23		12				
Ped. Clearance :		11		13				
Pedestrians Carry Over :								
Vehicle Extension :	3	3		3				
MAX 1 :	10	35		25				
MAX 2 :	10	35		25				
Yellow Change :	3	4		4				
Red Clearance :		3		3				

CONTROLLER: PHASE RECALL OPTIONS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector :								
Vehicle Recall :		X						
Pedestrian Recall :		X						
MAX Recall :								
Soft Recall :								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN * - 3 - 2, - 3 - 3

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec) 1	2	3	4	5	6	7	8
1	90	43	1	1	12	55		23				
2	100	88	1	2	11	66		23				
3	90	85	1	3	12	55		23				
4	85	0	1	4	12	50		23				
10	0	0	1	10	0	0		0				

Intersection Name:		TS ID:	Group NO:	IP address:
Brant St @ Prospect Street		141		172.22.65.2
Controller Make:	**Model:**		**Firmware Rev. No:**	
Econolite	ACS/3			

CP # 1, 2,3,4& 10	Phase:	1	2	3	4	5	6	7	8
Coord Phase	:		X						
Vehicle Recall	:								
Pedestrian Recall *(3-3, 5-2)	:		X						
Recall to MAX Time	:								
Phase Omit	:								
Special Function Outputs	:								

Coordinator Pattern #	Prefer.	Phase 1	2	3	4	5	6	7	8
	1								
	2								

X - select "." deselect

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, - 5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	07:30	1	1
1	1	2	09:30	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	07:30	4	1
2	2	1	09:30	1	1
2	2	4	16:00	4	1
2	2	10	23:00	254	1
3	3	4	08:30	4	1
3	3	1	10:30	1	1
3	3	4	17:00	4	1
3	3	10	20:30	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOM	WOM/ Year	Day Plan
New Year's Day	1	Fixed	01	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	04	6	1	3
Victoria Day	4	Float	05	2	3	3
Canada Day	5	Fixed	07	1	0	3
Civic Day	6	Float	08	2	1	3
Labour Day	7	Float	09	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Group NO:	IP address:
Brant St @ Ghent Ave	142		172.22.64.2

Controller Make:	Model:	Firmware Rev. No:	
Econolite	ACS/3		

Type of Operation 8 Phase Semi-Actuated

Revision

NO	Date Y	Date M	Date D	Description	Prepared by:
2	2014	12	4	Changed offsets Pattern 2	BP

*- Start From Main Menu

PHASE DESCRIPTION

Ph1		Ph5	
Ph2	NB - Brant St.	PH6	SB - Brant St.
Ph3		Ph7	
Ph4	EB / WB- Ghent Ave	Ph8	

CONFIGURATION (PHASE SEQ): PHASE IN USE /EXCLUSIVE PED (MM) * - 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use :		X		X		X		
Exclusive PED :								

CONTROLLER: CONTROLLER TIMING DATA - VEHICLE TIMINGS (4 available) * - 2 - 1

Timing Plan: 1

Phase:	1	2	3	4	5	6	7	8
Minimum Green :		8		8		8		
Conditional Service Min. Green :								
Walk :		16		15		16		
Ped. Clearance :		10		16		10		
Pedestrians Carry Over :								
Vehicle Extension :		3		3		3		
MAX 1 :		35		25		35		
MAX 2 :		35		25		35		
Yellow Change :		4		4		4		
Red Clearance :		3		3		3		

CONTROLLER: PHASE RECALL OPTIONS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector :								
Vehicle Recall :		X				X		
Pedestrian Recall :		X				X		
MAX Recall :								
Soft Recall :								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN * - 3 - 2, - 3 - 3

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec) 1	2	3	4	5	6	7	8
1	90	63	1	1		49		41		49		
2	100	85	1	2		49		51		49		
3	90	88	1	3		49		41		49		
4	85	12	1	4		44		41		44		
10	0	0	1	10		0		0		0		

Intersection Name:	TS ID:	Group NO:	IP address:
Brant St @ Ghent Ave	142		172.22.64.2
Controller Make:	**Model:**	**Firmware Rev. No:**	
Econolite	ACS/3		

CP # 1, 2,3,4& 10	Phase:	1	2	3	4	5	6	7	8
Coord Phase	:		X				X		
Vehicle Recall	:								
Pedestrian Recall *(3-3, 5-2)	:		X				X		
Recall to MAX Time	:								
Phase Omit	:								
Special Function Outputs	:								

Coordinator Pattern #	Prefer.	Phase 1	2	3	4	5	6	7	8
	1								
	2								

X - select "." deselect

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, - 5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	07:30	1	1
1	1	2	09:30	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	07:30	4	1
2	2	1	09:30	1	1
2	2	4	16:00	4	1
2	2	10	23:00	254	1
3	3	4	08:30	4	1
3	3	1	10:30	1	1
3	3	4	17:00	4	1
3	3	10	20:30	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOM	WOM/ Year	Day Plan
New Year's Day	1	Fixed	01	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	04	6	1	3
Victoria Day	4	Float	05	2	3	3
Canada Day	5	Fixed	07	1	0	3
Civic Day	6	Float	08	2	1	3
Labour Day	7	Float	09	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Group NO:	IP address:
Brant St @ Blairholm Street	143		172.22.63.2
Controller Make:	**Model:**	**Firmware Rev. No:**	
Econolite	ACS/3		

Type of Operation 8 Phase Semi-Actuated

Revision

NO	Date Y	Date M	Date D	Description	Prepared by:
1	2014	11	17	Implement timings in Centracs	MA

*- Start From Main Menu

PHASE DESCRIPTION

Ph1		Ph5	
Ph2	NB - Brant St.	PH6	SB - Brant St.
Ph3		Ph7	
Ph4	EB - Duplicate Phase	Ph8	WB - Blairholm Street

CONFIGURATION (PHASE SEQ): PHASE IN USE /EXCLUSIVE PED (MM) * - 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use :		X		X		X		X
Exclusive PED :								

CONTROLLER: CONTROLLER TIMING DATA - VEHICLE TIMINGS (4 available) * - 2 - 1

Timing Plan: 1

Phase:	1	2	3	4	5	6	7	8
Minimum Green :		8		8		8		8
Conditional Service Min. Green :								
Walk :		25		10		25		10
Ped. Clearance :		8		10		8		10
Pedestrians Carry Over :								
Vehicle Extension :		3		3		3		3
MAX 1 :		35		20		35		20
MAX 2 :		35		20		35		20
Yellow Change :		4		4		4		4
Red Clearance :		3		2		3		2

CONTROLLER: PHASE RECALL OPTIONS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector :								
Vehicle Recall :		X				X		
Pedestrian Recall :		X				X		
MAX Recall :								
Soft Recall :								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN * - 3 - 2, - 3 - 3

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec) 1	2	3	4	5	6	7	8
1	90	55	1	1		57		33		57		33
2	100	75	1	2		67		33		67		33
3	90	73	1	3		57		33		57		33
4	85	28	1	4		52		33		52		33
10	0	0	1	10		0		0		0		0

Intersection Name:	TS ID:	Group NO:	IP address:
Brant St @ Blairholm Street	143		172.22.63.2
Controller Make:	**Model:**	**Firmware Rev. No:**	
Econolite	ACS/3		

CP # 1, 2,3,4& 10	Phase:	1	2	3	4	5	6	7	8
Coord Phase	:		X				X		
Vehicle Recall	:								
Pedestrian Recall *(3-3, 5-2)	:		X				X		
Recall to MAX Time	:								
Phase Omit	:								
Special Function Outputs	:								

Coordinator Pattern #	Prefer.	Phase 1	2	3	4	5	6	7	8
	1								
	2								

X - select "." deselect

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, - 5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	07:30	1	1
1	1	10	09:00	254	1
1	1	1	09:15	1	1
1	1	2	09:30	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	07:30	4	1
2	2	1	09:30	1	1
2	2	4	16:00	4	1
2	2	10	23:00	254	1
3	3	4	08:30	4	1
3	3	1	10:30	1	1
3	3	4	17:00	4	1
3	3	10	20:30	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOM	WOM/ Year	Day Plan
New Year's Day	1	Fixed	01	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	04	6	1	3
Victoria Day	4	Float	05	2	3	3
Canada Day	5	Fixed	07	1	0	3
Civic Day	6	Float	08	2	1	3
Labour Day	7	Float	09	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Brant St @ Balwin /Victoria Ave	144	1	ACS/3	172.22.62.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		MA
1	2017	7	20	Controller upgrade (Phase 4 & 8 are tied together)	

PHASE DESCRIPTION

Ph1		Ph5	
Ph2	NB - Brant St	Ph6	SB - Brant St
Ph3		Ph7	
Ph4	EB/WB- Baldwin St/ Victoria Ave	Ph8	

PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use		X		X		X		
Exclusive PED								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green		8		8		8		
Walk		25		15		25		
Ped. Clearance		9		10		9		
Pedestrian Carry Over								
Vehicle Extension		3		3		3		
MAX 1		35		20		35		
MAX 2		35		20		35		
Yellow Change		4		4		4		
Red Clearance		2		2		2		
Phase Minimum:	1	41	1	32	1	41	1	1

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector								
Vehicle Recall								
Pedestrian Recall		X				X		
MAX Recall		X				X		
Min Recall								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN *** - 3 - 2, - 3 - 3**

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	90	82	1	1		56		34		56		
2	100	27	1	2		67		33		67		
3	90	36	1	3		56		34		56		
4	85	32	1	4		50		35		50		
10	0	0	1	10		0		0		0		

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, -5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan	
1	1	1	07:30	1	1	
1	1	2	09:30	2	1	Schedule 1 = Day Plan 1
1	1	3	15:30	3	1	Schedule 2 = Day Plan 2
1	1	4	19:00	4	1	Schedule 3 = Day Plan 3
1	1	10	22:00	254	1	
2	2	4	07:30	4	1	Day Plan 1 (Weekday)
2	2	1	09:30	1	1	Day Plan 2 (Saturday)
2	2	4	16:00	4	1	Day Plan 3 (Sunday, Holidays)
2	2	10	23:00	254	1	
3	3	4	08:30	4	1	
3	3	1	10:30	1	1	
3	3	4	17:00	4	1	Action Plan 10 = free (254)
3	3	10	20:30	254	1	

Special Programming:

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Fixed	XX	XX	XX	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Appendix C

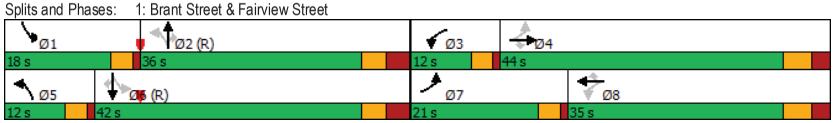
Existing Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	486	170	108	231	137	130	453	132	174	541	84
Future Volume (vph)	161	486	170	108	231	137	130	453	132	174	541	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		190.0	75.0		0.0	85.0		80.0	55.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00		0.96	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3406	1538	1687	3343	1509	1719	3539	1553	1671	3539	1392
Flt Permitted	0.462			0.352			0.388			0.414		
Satd. Flow (perm)	857	3406	1509	623	3343	1481	700	3539	1497	721	3539	1364
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			185			193			192			153
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		327.7			350.7			292.3			238.7	
Travel Time (s)		23.6			25.3			21.0			17.2	
Confl. Peds. (#/hr)	5		5	5		5	6		18	18		6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	6%	5%	7%	8%	7%	5%	2%	4%	8%	2%	16%
Adj. Flow (vph)	175	528	185	117	251	149	141	492	143	189	588	91
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	528	185	117	251	149	141	492	143	189	588	91
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes				
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	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%
Maximum Green (s)	17.0	37.6	37.6	8.0	28.6	28.6	8.0	29.5	29.5	14.0	35.5	35.5
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?												
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
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	36.9	23.2	23.2	28.0	17.8	17.8	58.8	46.5	46.5	62.3	48.3	48.3
Actuated g/C Ratio	0.34	0.21	0.21	0.25	0.16	0.16	0.53	0.42	0.42	0.57	0.44	0.44
v/c Ratio	0.44	0.74	0.40	0.50	0.47	0.37	0.30	0.33	0.19	0.37	0.38	0.13
Control Delay	29.3	46.7	7.5	33.1	44.5	5.0	13.3	23.7	2.0	13.8	23.1	0.8
Queue Delay	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 Delay	29.3	46.7	7.5	33.1	44.5	5.0	13.3	23.7	2.0	13.8	23.1	0.8
LOS	C	D	A	C	D	A	B	C	A	B	C	A
Approach Delay		35.1			30.5			17.8			18.7	
Approach LOS		D			C			B			B	

Intersection Summary		
Area Type:	Other	
Cycle Length: 110		
Actuated Cycle Length: 110		
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 85		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.74		
Intersection Signal Delay: 25.3	Intersection LOS: C	
Intersection Capacity Utilization 67.5%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 1: Brant Street & Fairview Street



Queues
1: Brant Street & Fairview Street

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	175	528	185	117	251	149	141	492	143	189	588	91
v/c Ratio	0.44	0.74	0.40	0.50	0.47	0.37	0.30	0.33	0.19	0.37	0.38	0.13
Control Delay	29.3	46.7	7.5	33.1	44.5	5.0	13.3	23.7	2.0	13.8	23.1	0.8
Queue Delay	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 Delay	29.3	46.7	7.5	33.1	44.5	5.0	13.3	23.7	2.0	13.8	23.1	0.8
Queue Length 50th (m)	28.6	58.8	0.0	18.5	27.3	0.0	13.6	38.4	0.0	18.9	46.0	0.0
Queue Length 95th (m)	42.4	72.6	17.2	29.9	39.4	8.6	26.8	61.7	6.0	35.3	71.3	1.5
Internal Link Dist (m)		303.7			326.7			268.3			214.7	
Turn Bay Length (m)			190.0	75.0			85.0		80.0	55.0		90.0
Base Capacity (vph)	432	1164	637	237	869	527	468	1496	743	545	1552	684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.45	0.29	0.49	0.29	0.28	0.30	0.33	0.19	0.35	0.38	0.13

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Brant Street & Fairview Street

Base Year
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	486	170	108	231	137	130	453	132	174	541	84
Future Volume (vph)	161	486	170	108	231	137	130	453	132	174	541	84
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	0.98
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)	1766	3406	1509	1685	3343	1481	1717	3539	1497	1664	3539	1364
Flt Permitted	0.46	1.00	1.00	0.35	1.00	1.00	0.39	1.00	1.00	0.41	1.00	1.00
Satd. Flow (perm)	859	3406	1509	625	3343	1481	701	3539	1497	725	3539	1364
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)	175	528	185	117	251	149	141	492	143	189	588	91
RTOR Reduction (vph)	0	0	146	0	0	125	0	0	83	0	0	51
Lane Group Flow (vph)	175	528	39	117	251	24	141	492	60	189	588	40
Confl. Peds. (#/hr)	5		5	5		5	6		18	18		6
Heavy Vehicles (%)	2%	6%	5%	7%	8%	7%	5%	2%	4%	8%	2%	16%
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)	35.1	23.2	23.2	25.7	17.8	17.8	56.2	46.4	46.4	59.8	48.2	48.2
Effective Green, g (s)	35.1	23.2	23.2	25.7	17.8	17.8	56.2	46.4	46.4	59.8	48.2	48.2
Actuated g/C Ratio	0.32	0.21	0.21	0.23	0.16	0.16	0.51	0.42	0.42	0.54	0.44	0.44
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)	383	718	318	222	540	239	448	1492	631	493	1550	597
v/s Ratio Prot	c0.06	c0.16		0.04	0.08		0.03	0.14		c0.04	0.17	
v/s Ratio Perm	0.09		0.03	0.09		0.02	0.13		0.04	c0.17		0.03
v/c Ratio	0.46	0.74	0.12	0.53	0.46	0.10	0.31	0.33	0.10	0.38	0.38	0.07
Uniform Delay, d1	28.4	40.5	35.2	34.8	41.8	39.3	14.4	21.4	19.2	13.1	20.8	17.9
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	0.9	3.9	0.2	2.3	0.6	0.2	0.4	0.6	0.3	0.5	0.7	0.2
Delay (s)	29.3	44.5	35.3	37.1	42.4	39.5	14.9	21.9	19.5	13.6	21.5	18.1
Level of Service	C	D	D	D	D	D	B	C	B	B	C	B
Approach Delay (s)		39.6			40.4			20.2			19.5	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	67.5%	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)	45	6	15	50	4	87	26	653	42	95	869	82
Future Volume (vph)	45	6	15	50	4	87	26	653	42	95	869	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		0.99	1.00	
Frt		0.894			0.856			0.991			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1670	0	1770	1581	0	1805	3457	0	1770	3449	0
Flt Permitted	0.691			0.742			0.236			0.343		
Satd. Flow (perm)	1197	1670	0	1366	1581	0	446	3457	0	631	3449	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			98			11			17	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.9			245.1			144.7			292.3	
Travel Time (s)		11.2			17.6			10.4			21.0	
Confl. Peds. (#/hr)	7		11	11		7	18		29	29		18
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	9%	0%	0%	2%	0%	1%	0%	3%	5%	2%	3%	2%
Adj. Flow (vph)	51	7	17	56	4	98	29	734	47	107	976	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	24	0	56	102	0	29	781	0	107	1068	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		41.0	41.0		10.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	12.0	12.0		12.0	12.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	9.9	9.9		9.9	9.9		62.4	62.4		70.7	62.4	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.69	0.69		0.79	0.69	
v/c Ratio	0.39	0.12		0.37	0.39		0.09	0.33		0.18	0.45	
Control Delay	45.3	20.7		43.7	13.2		4.9	4.2		3.4	9.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	45.3	20.7		43.7	13.2		4.9	4.2		3.4	9.2	
LOS	D	C		D	B		A	A		A	A	
Approach Delay		37.4			24.0			4.2			8.7	
Approach LOS		D			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 43 (48%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 9.1		Intersection LOS: A	
Intersection Capacity Utilization 65.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Brant Street & Grahams Lane/Prospect Street



Queues
2: Brant Street & Grahams Lane/Prospect Street

Base Year
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	51	24	56	102	29	781	107	1068
v/c Ratio	0.39	0.12	0.37	0.39	0.09	0.33	0.18	0.45
Control Delay	45.3	20.7	43.7	13.2	4.9	4.2	3.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	20.7	43.7	13.2	4.9	4.2	3.4	9.2
Queue Length 50th (m)	8.9	1.2	9.7	0.7	0.9	12.5	3.4	47.7
Queue Length 95th (m)	19.2	8.1	20.5	14.3	3.2	23.2	8.3	74.0
Internal Link Dist (m)		130.9		221.1		120.7		268.3
Turn Bay Length (m)	40.0		20.0		20.0		20.0	
Base Capacity (vph)	212	310	242	361	309	2400	620	2396
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.08	0.23	0.28	0.09	0.33	0.17	0.45

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Brant Street & Grahams Lane/Prospect Street

Base Year
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	6	15	50	4	87	26	653	42	95	869	82
Future Volume (vph)	45	6	15	50	4	87	26	653	42	95	869	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	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	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1645	1670		1749	1581		1796	3457		1763	3450	
Flt Permitted	0.69	1.00		0.74	1.00		0.24	1.00		0.34	1.00	
Satd. Flow (perm)	1197	1670		1366	1581		446	3457		636	3450	
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)	51	7	17	56	4	98	29	734	47	107	976	92
RTOR Reduction (vph)	0	15	0	0	89	0	0	4	0	0	6	0
Lane Group Flow (vph)	51	9	0	56	13	0	29	777	0	107	1062	0
Confl. Peds. (#/hr)	7		11	11		7	18		29	29		18
Heavy Vehicles (%)	9%	0%	0%	2%	0%	1%	0%	3%	5%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	8.3	8.3		8.3	8.3		59.0	59.0		64.7	59.0	
Effective Green, g (s)	8.3	8.3		8.3	8.3		59.0	59.0		64.7	59.0	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.66	0.66		0.72	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	110	154		125	145		292	2266		528	2261	
v/s Ratio Prot		0.01			0.01			0.22		c0.01	c0.31	
v/s Ratio Perm	c0.04			0.04			0.07			0.13		
v/c Ratio	0.46	0.06		0.45	0.09		0.10	0.34		0.20	0.47	
Uniform Delay, d1	38.7	37.3		38.7	37.4		5.7	6.9		3.8	7.7	
Progression Factor	1.00	1.00		1.00	1.00		0.52	0.50		1.00	1.00	
Incremental Delay, d2	3.1	0.2		2.5	0.3		0.7	0.4		0.2	0.7	
Delay (s)	41.8	37.4		41.2	37.7		3.6	3.8		4.0	8.4	
Level of Service	D	D		D	D		A	A		A	A	
Approach Delay (s)		40.4			38.9			3.8			8.0	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	65.2%	ICU Level of Service	C	
Analysis Period (min)	15			

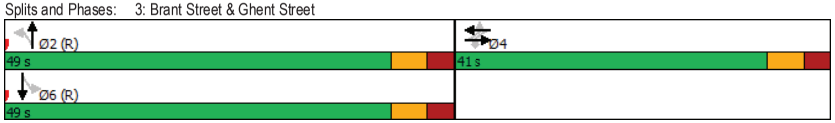
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	10	9	11	19	27	11	657	16	19	1001	19
Future Volume (vph)	152	10	9	11	19	27	11	657	16	19	1001	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		25.0	0.0		0.0	45.0		0.0	30.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99	0.98		0.99		0.99	1.00		0.98	1.00	
Frt			0.850		0.936			0.997			0.997	
Flt Protected		0.955			0.991		0.950			0.950		
Satd. Flow (prot)	0	1814	1615	0	1664	0	1805	3490	0	1805	3525	0
Flt Permitted		0.696			0.922		0.241			0.383		
Satd. Flow (perm)	0	1315	1575	0	1545	0	455	3490	0	712	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		28			3			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		177.0			166.8			87.4			144.7	
Travel Time (s)		12.7			12.0			6.3			10.4	
Confl. Peds. (#/hr)	7		15	15		7	21		36	36		21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	9%	0%	7%	0%	3%	0%	0%	2%	2%
Adj. Flow (vph)	157	10	9	11	20	28	11	677	16	20	1032	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	167	9	0	59	0	11	693	0	20	1052	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		16.9	16.9		16.9		59.1	59.1		59.1	59.1	
Actuated g/C Ratio		0.19	0.19		0.19		0.66	0.66		0.66	0.66	
v/c Ratio		0.68	0.03		0.19		0.04	0.30		0.04	0.45	
Control Delay		46.9	0.1		18.4		9.9	9.5		2.4	4.4	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.1	
Total Delay		46.9	0.1		18.4		9.9	9.5		2.4	4.5	
LOS		D	A		B		A	A		A	A	
Approach Delay		44.5			18.4			9.5			4.4	
Approach LOS		D			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 63 (70%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 10.1		Intersection LOS: B	
Intersection Capacity Utilization 70.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Brant Street & Ghent Street



Queues
3: Brant Street & Ghent Street

Base Year
AM Peak Hour

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	167	9	59	11	693	20	1052
v/c Ratio	0.68	0.03	0.19	0.04	0.30	0.04	0.45
Control Delay	46.9	0.1	18.4	9.9	9.5	2.4	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	46.9	0.1	18.4	9.9	9.5	2.4	4.5
Queue Length 50th (m)	28.5	0.0	4.7	0.9	29.9	0.2	7.7
Queue Length 95th (m)	45.4	0.0	13.8	m3.3	41.0	m0.8	10.2
Internal Link Dist (m)	153.0		142.8		63.4		120.7
Turn Bay Length (m)		25.0		45.0		30.0	
Base Capacity (vph)	496	624	601	298	2292	467	2315
Starvation Cap Reductn	0	0	0	0	0	0	255
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.01	0.10	0.04	0.30	0.04	0.51

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
3: Brant Street & Ghent Street

Base Year
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	10	9	11	19	27	11	657	16	19	1001	19
Future Volume (vph)	152	10	9	11	19	27	11	657	16	19	1001	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		0.99	1.00		0.98	1.00	
Frt		1.00	0.85		0.94		1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1805	1575		1660		1792	3489		1763	3525	
Flt Permitted		0.70	1.00		0.92		0.24	1.00		0.38	1.00	
Satd. Flow (perm)		1315	1575		1545		455	3489		710	3525	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	157	10	9	11	20	28	11	677	16	20	1032	20
RTOR Reduction (vph)	0	0	7	0	23	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	167	2	0	36	0	11	692	0	20	1051	0
Confl. Peds. (#/hr)	7		15	15		7	21		36	36		21
Heavy Vehicles (%)	0%	0%	0%	9%	0%	7%	0%	3%	0%	0%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Actuated Green, G (s)		16.9	16.9		16.9		59.1	59.1		59.1	59.1	
Effective Green, g (s)		16.9	16.9		16.9		59.1	59.1		59.1	59.1	
Actuated g/C Ratio		0.19	0.19		0.19		0.66	0.66		0.66	0.66	
Clearance Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		246	295		290		298	2291		466	2314	
v/s Ratio Prot								0.20			c0.30	
v/s Ratio Perm		c0.13	0.00		0.02		0.02			0.03		
v/c Ratio		0.68	0.01		0.13		0.04	0.30		0.04	0.45	
Uniform Delay, d1		34.0	29.7		30.4		5.4	6.6		5.5	7.6	
Progression Factor		1.00	1.00		1.00		1.26	1.23		0.30	0.45	
Incremental Delay, d2		7.2	0.0		0.2		0.2	0.3		0.2	0.6	
Delay (s)		41.3	29.7		30.6		7.1	8.5		1.8	4.0	
Level of Service		D	C		C		A	A		A	A	
Approach Delay (s)		40.7			30.6			8.5			3.9	
Approach LOS		D			C			A			A	

Intersection Summary					
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.50				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		14.0	
Intersection Capacity Utilization	70.7%	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)	27	3	48	3	0	8	21	644	2	15	995	11
Future Volume (vph)	27	3	48	3	0	8	21	644	2	15	995	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.916			0.899						0.998	
Flt Protected		0.983			0.988		0.950			0.950		
Satd. Flow (prot)	0	1650	0	0	1688	0	1641	3472	0	1687	1807	0
Flt Permitted		0.983			0.988		0.950			0.950		
Satd. Flow (perm)	0	1650	0	0	1688	0	1641	3472	0	1687	1807	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		104.9			57.0			58.9			95.8	
Travel Time (s)		7.6			4.1			4.2			6.9	
Confl. Peds. (#/hr)							64		56	56		64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	10%	4%	0%	7%	5%	0%
Adj. Flow (vph)	29	3	52	3	0	9	23	700	2	16	1082	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	0	0	12	0	23	702	0	16	1094	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	3	48	3	0	8	21	644	2	15	995	11
Future Volume (Veh/h)	27	3	48	3	0	8	21	644	2	15	995	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	3	52	3	0	9	23	700	2	16	1082	12
Pedestrians		64			56							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		5			5							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								136			183	
pX, platoon unblocked	0.37	0.37	0.36	0.37	0.37	0.97	0.36			0.97		
vC, conflicting volume	1589	1988	1152	1970	1993	407	1158			758		
vC1, stage 1 conf vol	1184	1184		803	803							
vC2, stage 2 conf vol	405	804		1168	1190							
vCu, unblocked vol	1443	2515	527	2468	2528	329	544			690		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.3			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	79	98	68	96	100	99	93			98		
cM capacity (veh/h)	141	139	164	83	122	623	328			803		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	84	12	23	467	235	16	1094
Volume Left	29	3	23	0	0	16	0
Volume Right	52	9	0	0	2	0	12
cSH	155	237	328	1700	1700	803	1700
Volume to Capacity	0.54	0.05	0.07	0.27	0.14	0.02	0.64
Queue Length 95th (m)	21.8	1.3	1.8	0.0	0.0	0.5	0.0
Control Delay (s)	53.1	21.0	16.8	0.0	0.0	9.6	0.0
Lane LOS	F	C	C			A	
Approach Delay (s)	53.1	21.0	0.5			0.1	
Approach LOS	F	C					

Intersection Summary					
Average Delay	2.7				
Intersection Capacity Utilization	66.5%	ICU Level of Service		C	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	1	35	0	124	0	541	21	46	612	0
Future Volume (vph)	2	1	1	35	0	124	0	541	21	46	612	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	0		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.99	0.84	0.86		0.97		1.00		0.97		
Frt			0.850			0.850		0.994				
Flt Protected		0.968		0.950						0.950		
Satd. Flow (prot)	0	1104	1615	1626	0	1509	0	3167	0	1656	1743	0
Flt Permitted		0.968		0.756						0.400		
Satd. Flow (perm)	0	1089	1358	1111	0	1461	0	3167	0	675	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48			146		7				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.3			100.7			228.8			77.4	
Travel Time (s)		4.3			7.3			16.5			5.6	
Confl. Peds. (#/hr)	15		63	63		15	119		60	60		119
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	100%	0%	0%	11%	0%	7%	0%	13%	10%	9%	9%	0%
Adj. Flow (vph)	2	1	1	41	0	146	0	636	25	54	720	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	1	41	0	146	0	661	0	54	720	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1		1		2		1	2	
Detector Template	Left	Thru	Right	Left		Right		Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0		2.0		10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0		2.0		0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	4	8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0		8.0		8.0		8.0	8.0	
Minimum Split (s)	26.0	26.0	26.0	26.0		26.0		40.5		40.5	40.5	
Total Split (s)	33.0	33.0	33.0	33.0		33.0		57.0		57.0	57.0	
Total Split (%)	36.7%	36.7%	36.7%	36.7%		36.7%		63.3%		63.3%	63.3%	
Maximum Green (s)	27.0	27.0	27.0	27.0		27.0		50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0		4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0		3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Recall Mode	None	None	None	None		None		C-Max		C-Max	C-Max	
Walk Time (s)	10.0	10.0	10.0	10.0		10.0		25.0		25.0	25.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0		10.0		8.0		8.0	8.0	
Pedestrian Calls (#/hr)	0	0	0	0		0		0		0	0	
Act Effct Green (s)		9.6	9.6	9.6		9.6		67.4		67.4	67.4	
Actuated g/C Ratio		0.11	0.11	0.11		0.11		0.75		0.75	0.75	
v/c Ratio		0.03	0.01	0.35		0.51		0.28		0.11	0.55	
Control Delay		35.0	0.0	44.9		13.2		3.6		3.6	7.8	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		35.0	0.0	44.9		13.2		3.6		3.6	7.8	
LOS		C	A	D		B		A		A	A	
Approach Delay		26.3			20.1			3.6			7.5	
Approach LOS		C			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 55 (61%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 7.4		Intersection LOS: A	
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Brant Street & South Driveway/Blairholm Avenue



Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	3	1	41	146	661	54	720
v/c Ratio	0.03	0.01	0.35	0.51	0.28	0.11	0.55
Control Delay	35.0	0.0	44.9	13.2	3.6	3.6	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	0.0	44.9	13.2	3.6	3.6	7.8
Queue Length 50th (m)	0.5	0.0	7.1	0.0	12.4	2.0	31.2
Queue Length 95th (m)	2.9	0.0	15.9	14.3	22.4	4.7	48.3
Internal Link Dist (m)	35.3				204.8		53.4
Turn Bay Length (m)			15.0			15.0	
Base Capacity (vph)	326	441	333	540	2373	505	1305
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.00	0.12	0.27	0.28	0.11	0.55

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	1	35	0	124	0	541	21	46	612	0
Future Volume (vph)	2	1	1	35	0	124	0	541	21	46	612	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00	1.00		1.00		0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.84	1.00		0.97		1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00	0.86		1.00		1.00		0.97	1.00	
Frt		1.00	0.85	1.00		0.85		0.99		1.00	1.00	
Flt Protected		0.97	1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1088	1358	1397		1461		3168		1602	1743	
Flt Permitted		0.97	1.00	0.76		1.00		1.00		0.40	1.00	
Satd. Flow (perm)		1088	1358	1111		1461		3168		675	1743	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	2	1	1	41	0	146	0	636	25	54	720	0
RTOR Reduction (vph)	0	0	1	0	0	130	0	2	0	0	0	0
Lane Group Flow (vph)	0	3	0	41	0	16	0	659	0	54	720	0
Confl. Peds. (#/hr)	15		63	63		15	119		60	60		119
Heavy Vehicles (%)	100%	0%	0%	11%	0%	7%	0%	13%	10%	9%	9%	0%
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Actuated Green, G (s)		9.6	9.6	9.6		9.6		67.4		67.4	67.4	
Effective Green, g (s)		9.6	9.6	9.6		9.6		67.4		67.4	67.4	
Actuated g/C Ratio		0.11	0.11	0.11		0.11		0.75		0.75	0.75	
Clearance Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		116	144	118		155		2372		505	1305	
v/s Ratio Prot								0.21			c0.41	
v/s Ratio Perm		0.00	0.00	c0.04		0.01				0.08		
v/c Ratio		0.03	0.00	0.35		0.10		0.28		0.11	0.55	
Uniform Delay, d1		36.0	35.9	37.3		36.3		3.6		3.1	4.8	
Progression Factor		1.00	1.00	1.00		1.00		0.89		0.88	1.15	
Incremental Delay, d2		0.1	0.0	1.8		0.3		0.3		0.4	1.6	
Delay (s)		36.1	35.9	39.1		36.6		3.5		3.1	7.1	
Level of Service		D	D	D		D		A		A	A	
Approach Delay (s)		36.1			37.1			3.5			6.8	
Approach LOS		D			D			A			A	

Intersection Summary					
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.53				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	70.9%	ICU Level of Service		C	
Analysis Period (min)	15				

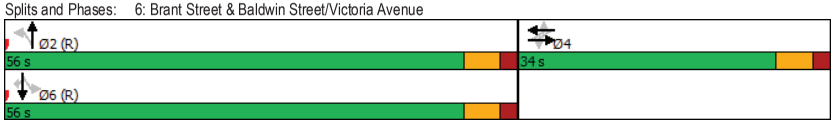
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	13	24	13	40	54	11	512	14	38	428	150
Future Volume (vph)	68	13	24	13	40	54	11	512	14	38	428	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	40.0		0.0	15.0		0.0	45.0		50.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. 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
Ped Bike Factor	0.82	0.90		0.87	0.88		0.97	1.00		0.95		0.91
Frt		0.902			0.914			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1546	0	1671	1443	0	1805	1849	0	1752	1810	1583
Flt Permitted	0.692			0.731			0.489			0.427		
Satd. Flow (perm)	1078	1546	0	1124	1443	0	898	1849	0	746	1810	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			57			2				160
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		105.7			113.2			98.7			228.8	
Travel Time (s)		9.5			10.2			7.1			16.5	
Confl. Peds. (#/hr)	192		74	74		192	54		105	105		54
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	8%	5%	6%	0%	2%	0%	3%	5%	2%
Adj. Flow (vph)	72	14	26	14	43	57	12	545	15	40	455	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	40	0	14	100	0	12	560	0	40	455	160
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Detector Phase	4	4		4	4		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	32.0	32.0		32.0	32.0		42.0	42.0		42.0	42.0	42.0
Total Split (s)	34.0	34.0		34.0	34.0		56.0	56.0		56.0	56.0	56.0
Total Split (%)	37.8%	37.8%		37.8%	37.8%		62.2%	62.2%		62.2%	62.2%	62.2%
Maximum Green (s)	28.0	28.0		28.0	28.0		50.0	50.0		50.0	50.0	50.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	25.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	11.8	11.8		11.8	11.8		70.2	70.2		70.2	70.2	70.2
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.78	0.78		0.78	0.78	0.78
v/c Ratio	0.51	0.18		0.10	0.42		0.02	0.39		0.07	0.32	0.14
Control Delay	48.0	19.0		33.5	22.3		4.3	5.6		2.8	3.3	1.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.0	19.0		33.5	22.3		4.3	5.6		2.8	3.3	1.3
LOS	D	B		C	C		A	A		A	A	A
Approach Delay		37.7			23.7			5.6			2.8	
Approach LOS		D			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 82 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 70.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Brant Street & Baldwin Street/Victoria Avenue



Queues
6: Brant Street & Baldwin Street/Victoria Avenue

Base Year
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	40	14	100	12	560	40	455	160
v/c Ratio	0.51	0.18	0.10	0.42	0.02	0.39	0.07	0.32	0.14
Control Delay	48.0	19.0	33.5	22.3	4.3	5.6	2.8	3.3	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	19.0	33.5	22.3	4.3	5.6	2.8	3.3	1.3
Queue Length 50th (m)	12.5	2.3	2.3	7.2	0.5	31.0	1.5	20.5	1.4
Queue Length 95th (m)	24.7	10.8	7.5	20.8	2.3	61.2	m3.3	46.5	6.6
Internal Link Dist (m)		81.7		89.2		74.7		204.8	
Turn Bay Length (m)	15.0		40.0		15.0		45.0		50.0
Base Capacity (vph)	335	498	349	488	700	1441	581	1411	1158
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.08	0.04	0.20	0.02	0.39	0.07	0.32	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
6: Brant Street & Baldwin Street/Victoria Avenue

Base Year
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	13	24	13	40	54	11	512	14	38	428	150
Future Volume (vph)	68	13	24	13	40	54	11	512	14	38	428	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.90		1.00	0.88		1.00	1.00		1.00	1.00	0.91
Flpb, ped/bikes	0.82	1.00		0.87	1.00		0.96	1.00		0.94	1.00	1.00
Frt	1.00	0.90		1.00	0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1479	1547		1461	1444		1738	1848		1647	1810	1441
Flt Permitted	0.69	1.00		0.73	1.00		0.49	1.00		0.43	1.00	1.00
Satd. Flow (perm)	1078	1547		1124	1444		895	1848		741	1810	1441
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	72	14	26	14	43	57	12	545	15	40	455	160
RTOR Reduction (vph)	0	23	0	0	51	0	0	0	0	0	0	39
Lane Group Flow (vph)	72	17	0	14	49	0	12	560	0	40	455	121
Confl. Peds. (#/hr)	192		74	74		192	54		105	105		54
Heavy Vehicles (%)	0%	0%	0%	8%	5%	6%	0%	2%	0%	3%	5%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)	10.2	10.2		10.2	10.2		67.8	67.8		67.8	67.8	67.8
Effective Green, g (s)	10.2	10.2		10.2	10.2		67.8	67.8		67.8	67.8	67.8
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.75	0.75		0.75	0.75	0.75
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	122	175		127	163		674	1392		558	1363	1085
v/s Ratio Prot		0.01			0.03			c0.30			0.25	
v/s Ratio Perm	c0.07			0.01			0.01			0.05		0.08
v/c Ratio	0.59	0.10		0.11	0.30		0.02	0.40		0.07	0.33	0.11
Uniform Delay, d1	37.9	35.8		35.8	36.6		2.8	3.9		2.9	3.7	3.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.61	0.62	1.27
Incremental Delay, d2	7.4	0.2		0.4	1.1		0.0	0.9		0.2	0.6	0.2
Delay (s)	45.3	36.0		36.2	37.7		2.8	4.8		2.0	2.8	4.0
Level of Service	D	D		D	D		A	A		A	A	A
Approach Delay (s)		42.0			37.5			4.8			3.1	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	70.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	667	658	0
Future Volume (vph)	0	0	0	667	658	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	15.0			0.0
Storage Lanes	0	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	1863	3539	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	1863	3539	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.1			77.4	58.9	
Travel Time (s)	3.6			5.6	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	725	715	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	725	715	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	667	658	0
Future Volume (Veh/h)	0	0	0	667	658	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	725	715	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				77	242	
pX, platoon unblocked	0.84	0.82	0.82			
vC, conflicting volume	1078	715	715			
vC1, stage 1 conf vol	715					
vC2, stage 2 conf vol	362					
vCu, unblocked vol	782	540	540			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	423	397	838			

Direction, Lane #	NB 1	NB 2	NB 3	SB 1
Volume Total	0	362	362	715
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.21	0.21	0.42
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			0.0
Approach LOS				

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		38.0%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection: 1: Brant Street & Fairview Street

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	T	L	T	T	R	L	T	T	R	L
Maximum Queue (m)	54.4	85.7	71.0	41.5	53.2	45.4	5.7	46.6	49.6	56.1	14.3	61.7
Average Queue (m)	26.5	52.5	42.5	20.1	28.7	18.2	0.2	18.5	26.1	30.7	1.5	24.6
95th Queue (m)	47.2	73.6	65.5	36.5	46.4	36.6	4.0	35.5	44.3	49.4	9.1	49.6
Link Distance (m)	313.0	313.0	313.0		336.1	336.1	336.1		266.9	266.9		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)				75.0				85.0			80.0	55.0
Storage Blk Time (%)												0
Queuing Penalty (veh)												1

Intersection: 1: Brant Street & Fairview Street

Movement	SB	SB
Directions Served	T	T
Maximum Queue (m)	77.8	68.3
Average Queue (m)	43.7	29.5
95th Queue (m)	69.1	59.4
Link Distance (m)	224.1	224.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)	3	
Queuing Penalty (veh)	5	

Intersection: 2: Brant Street & Grahams Lane/Prospect Street

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	32.8	13.9	22.3	24.8	20.0	40.1	44.9	27.4	161.4	164.7
Average Queue (m)	11.2	4.1	9.1	8.0	4.2	15.7	19.0	15.9	74.5	59.3
95th Queue (m)	24.3	11.9	18.9	17.3	12.7	34.1	37.0	32.3	149.2	140.6
Link Distance (m)		140.7		228.0		121.8	121.8		266.9	266.9
Upstream Blk Time (%)										0
Queuing Penalty (veh)										0
Storage Bay Dist (m)	40.0		20.0		20.0			20.0		
Storage Blk Time (%)	0		4	0	0	5		1	36	
Queuing Penalty (veh)	0		3	0	1	1		3	34	

Intersection: 3: Brant Street & Ghent Street

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	64.3	18.3	28.0	12.6	41.0	45.7	33.2	133.7	130.4
Average Queue (m)	29.0	2.2	9.8	2.7	19.0	21.7	5.0	98.4	75.4
95th Queue (m)	51.0	13.1	21.1	9.4	35.8	37.4	21.3	161.2	160.3
Link Distance (m)	163.0		152.7		67.2	67.2		121.8	121.8
Upstream Blk Time (%)								12	4
Queuing Penalty (veh)								56	19
Storage Bay Dist (m)		25.0		45.0			30.0		
Storage Blk Time (%)	14	0			0			30	
Queuing Penalty (veh)	1	0			0			6	

Intersection: 4: Brant Street & Olga Drive/Rambo Crescent

Movement	EB	WB	NB	NB	NB	SB	SB	B23
Directions Served	LTR	LTR	L	T	TR	L	TR	T
Maximum Queue (m)	39.9	9.8	15.6	2.0	3.0	7.7	22.5	19.7
Average Queue (m)	15.6	2.6	4.1	0.1	0.1	1.5	1.1	0.7
95th Queue (m)	31.6	9.2	12.5	1.4	1.6	6.4	16.5	12.8
Link Distance (m)	93.5	41.8		40.4	40.4		77.0	67.2
Upstream Blk Time (%)							0	0
Queuing Penalty (veh)							1	0
Storage Bay Dist (m)			20.0			15.0		
Storage Blk Time (%)			1				0	
Queuing Penalty (veh)			2				0	

Intersection: 5: Brant Street & South Driveway/Blairholm Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	R	T	TR	L	T
Maximum Queue (m)	17.6	3.5	20.4	35.2	57.7	50.9	22.3	67.1
Average Queue (m)	0.9	0.2	7.2	14.2	24.2	21.2	7.3	45.3
95th Queue (m)	7.4	2.1	17.4	27.1	46.9	41.4	19.8	74.6
Link Distance (m)	47.9	47.9		87.0	203.2	203.2		62.4
Upstream Blk Time (%)								3
Queuing Penalty (veh)								17
Storage Bay Dist (m)			15.0				15.0	
Storage Blk Time (%)			4	5			1	22
Queuing Penalty (veh)			5	2			6	10

Intersection: 6: Brant Street & Baldwin Street/Victoria Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (m)	21.0	25.0	11.3	34.3	17.7	88.0	21.4	60.1	34.2
Average Queue (m)	11.6	5.5	2.2	15.2	2.6	41.3	7.2	29.3	10.3
95th Queue (m)	20.8	16.9	8.4	29.1	10.3	72.1	17.6	49.8	25.4
Link Distance (m)		91.1		99.4		88.1		203.2	
Upstream Blk Time (%)						0			
Queuing Penalty (veh)						0			
Storage Bay Dist (m)	15.0		40.0		15.0		45.0		50.0
Storage Blk Time (%)	13	0		0	0	24		1	0
Queuing Penalty (veh)	5	0		0	0	3		2	0

Intersection: 7: Brant Street & North Driveway

Movement	SB
Directions Served	TR
Maximum Queue (m)	35.3
Average Queue (m)	4.5
95th Queue (m)	20.5
Link Distance (m)	40.4
Upstream Blk Time (%)	0
Queuing Penalty (veh)	1
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 185

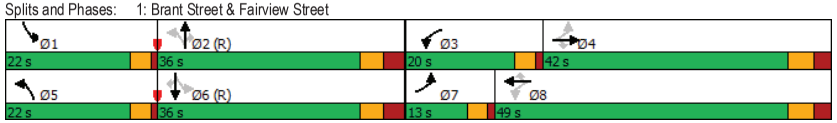
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	566	191	209	1039	284	264	663	157	180	555	176
Future Volume (vph)	217	566	191	209	1039	284	264	663	157	180	555	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		190.0	75.0		0.0	85.0		80.0	55.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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
Ped Bike Factor			0.98	1.00		0.96	0.99		0.92	0.98		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3471	1583	1752	3539	1553	1787	3574	1568	1752	3574	1568
Flt Permitted	0.111			0.272			0.274			0.251		
Satd. Flow (perm)	211	3471	1550	500	3539	1495	511	3574	1450	455	3574	1510
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			197			266			162			181
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		327.7			350.7			292.3			238.7	
Travel Time (s)		23.6			25.3			21.0			17.2	
Confl. Peds. (#/hr)	17		6	6		17	17		43	43		17
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	2%	3%	2%	4%	1%	1%	3%	3%	1%	3%
Adj. Flow (vph)	224	584	197	215	1071	293	272	684	162	186	572	181
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	584	197	215	1071	293	272	684	162	186	572	181
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes				
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	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%
Maximum Green (s)	9.0	35.6	35.6	16.0	42.6	42.6	18.0	29.5	29.5	18.0	29.5	29.5
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?												
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
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	47.5	36.1	36.1	55.7	40.9	40.9	54.3	35.9	35.9	49.2	33.4	33.4
Actuated g/C Ratio	0.40	0.30	0.30	0.46	0.34	0.34	0.45	0.30	0.30	0.41	0.28	0.28
v/c Ratio	1.10	0.56	0.33	0.57	0.89	0.43	0.68	0.64	0.30	0.56	0.58	0.33
Control Delay	122.9	37.8	5.9	25.4	47.4	6.7	30.4	40.9	6.9	27.2	41.0	6.9
Queue Delay	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 Delay	122.9	37.8	5.9	25.4	47.4	6.7	30.4	40.9	6.9	27.2	41.0	6.9
LOS	F	D	A	C	D	A	C	D	A	C	D	A
Approach Delay		50.5			36.9			33.4			31.7	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 37.9 Intersection LOS: D
Intersection Capacity Utilization 92.8% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 1: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	224	584	197	215	1071	293	272	684	162	186	572	181
v/c Ratio	1.10	0.56	0.33	0.57	0.89	0.43	0.68	0.64	0.30	0.56	0.58	0.33
Control Delay	122.9	37.8	5.9	25.4	47.4	6.7	30.4	40.9	6.9	27.2	41.0	6.9
Queue Delay	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 Delay	122.9	37.8	5.9	25.4	47.4	6.7	30.4	40.9	6.9	27.2	41.0	6.9
Queue Length 50th (m)	~44.0	62.7	0.0	30.5	128.2	4.4	42.8	79.0	0.0	27.8	66.7	0.0
Queue Length 95th (m)	#97.7	83.5	17.5	47.3	157.2	24.7	64.1	106.4	17.4	44.1	87.2	18.2
Internal Link Dist (m)		303.7			326.7			268.3			214.7	
Turn Bay Length (m)			190.0	75.0			85.0		80.0	55.0		90.0
Base Capacity (vph)	203	1049	606	401	1256	702	424	1069	547	396	994	550
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.56	0.33	0.54	0.85	0.42	0.64	0.64	0.30	0.47	0.58	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
1: Brant Street & Fairview Street

Base Year
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	566	191	209	1039	284	264	663	157	180	555	176
Future Volume (vph)	217	566	191	209	1039	284	264	663	157	180	555	176
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	0.96	1.00	1.00	0.92	1.00	1.00	0.96
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)	1805	3471	1550	1751	3539	1495	1784	3574	1450	1746	3574	1510
Flt Permitted	0.11	1.00	1.00	0.27	1.00	1.00	0.27	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	211	3471	1550	501	3539	1495	514	3574	1450	460	3574	1510
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	224	584	197	215	1071	293	272	684	162	186	572	181
RTOR Reduction (vph)	0	0	138	0	0	175	0	0	114	0	0	131
Lane Group Flow (vph)	224	584	59	215	1071	118	272	684	48	186	572	50
Confl. Peds. (#/hr)	17		6	6		17	17		43	43		17
Heavy Vehicles (%)	0%	4%	2%	3%	2%	4%	1%	1%	3%	3%	1%	3%
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)	45.1	36.1	36.1	53.9	40.9	40.9	51.7	35.9	35.9	46.7	33.4	33.4
Effective Green, g (s)	45.1	36.1	36.1	53.9	40.9	40.9	51.7	35.9	35.9	46.7	33.4	33.4
Actuated g/C Ratio	0.38	0.30	0.30	0.45	0.34	0.34	0.43	0.30	0.30	0.39	0.28	0.28
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)	198	1044	466	368	1206	509	388	1069	433	321	994	420
v/s Ratio Prot	c0.08	0.17		c0.07	0.30		c0.09	0.19		0.06	0.16	
v/s Ratio Perm	c0.34		0.04	0.19		0.08	c0.21		0.03	0.16		0.03
v/c Ratio	1.13	0.56	0.13	0.58	0.89	0.23	0.70	0.64	0.11	0.58	0.58	0.12
Uniform Delay, d1	30.4	35.3	30.5	22.0	37.4	28.3	24.1	36.4	30.5	25.9	37.2	32.3
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	103.7	0.7	0.1	2.4	8.2	0.2	5.6	2.9	0.5	2.5	2.4	0.6
Delay (s)	134.2	35.9	30.6	24.4	45.6	28.5	29.7	39.4	31.0	28.4	39.6	32.9
Level of Service	F	D	C	C	D	C	C	D	C	C	D	C
Approach Delay (s)		56.8			39.6			35.8			36.1	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	92.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
2: Brant Street & Grahams Lane/Prospect Street

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	11	43	78	8	132	11	824	39	174	814	44
Future Volume (vph)	127	11	43	78	8	132	11	824	39	174	814	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		0.99	1.00	
Frt		0.881			0.859			0.993			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1644	0	1805	1586	0	1805	3505	0	1787	3533	0
Flt Permitted	0.662			0.719			0.270			0.268		
Satd. Flow (perm)	1237	1644	0	1352	1586	0	512	3505	0	500	3533	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		46			140			8			9	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.9			245.1			144.7			292.3	
Travel Time (s)		11.2			17.6			10.4			21.0	
Confl. Peds. (#/hr)	8		10	10		8	9		25	25		9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	0%	2%	3%	1%	1%	5%
Adj. Flow (vph)	135	12	46	83	9	140	12	877	41	185	866	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	135	58	0	83	149	0	12	918	0	185	913	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		41.0	41.0		10.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	12.0	12.0		12.0	12.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	13.6	13.6		13.6	13.6		51.4	51.4		63.4	51.4	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.57	0.57		0.70	0.57	
v/c Ratio	0.73	0.20		0.41	0.42		0.04	0.46		0.40	0.45	
Control Delay	58.1	14.8		39.8	10.8		5.7	7.8		6.5	12.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.0	
Total Delay	58.1	14.8		39.8	10.8		5.7	7.9		6.5	12.6	
LOS	E	B		D	B		A	A		A	B	
Approach Delay		45.1			21.2			7.9			11.5	
Approach LOS		D			C			A			B	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 85 (94%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 13.7 Intersection LOS: B
Intersection Capacity Utilization 77.9% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Brant Street & Grahams Lane/Prospect Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	135	58	83	149	12	918	185	913
v/c Ratio	0.73	0.20	0.41	0.42	0.04	0.46	0.40	0.45
Control Delay	58.1	14.8	39.8	10.8	5.7	7.8	6.5	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	58.1	14.8	39.8	10.8	5.7	7.9	6.5	12.6
Queue Length 50th (m)	23.2	1.9	13.5	1.4	0.6	36.8	8.8	49.3
Queue Length 95th (m)	#45.9	12.2	27.4	17.5	m1.6	27.5	15.7	67.0
Internal Link Dist (m)		130.9		221.1		120.7		268.3
Turn Bay Length (m)	40.0		20.0		20.0		20.0	
Base Capacity (vph)	219	330	240	397	292	2003	486	2020
Starvation Cap Reductn	0	0	0	0	0	230	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.18	0.35	0.38	0.04	0.52	0.38	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
2: Brant Street & Grahams Lane/Prospect Street

Base Year
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	11	43	78	8	132	11	824	39	174	814	44
Future Volume (vph)	127	11	43	78	8	132	11	824	39	174	814	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.86		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1775	1644		1787	1586		1800	3506		1784	3534	
Flt Permitted	0.66	1.00		0.72	1.00		0.27	1.00		0.27	1.00	
Satd. Flow (perm)	1237	1644		1353	1586		511	3506		502	3534	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	135	12	46	83	9	140	12	877	41	185	866	47
RTOR Reduction (vph)	0	39	0	0	119	0	0	3	0	0	4	0
Lane Group Flow (vph)	135	19	0	83	30	0	12	915	0	185	909	0
Confl. Peds. (#/hr)	8		10	10		8	9		25	25		9
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	0%	2%	3%	1%	1%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	13.6	13.6		13.6	13.6		51.4	51.4		59.4	51.4	
Effective Green, g (s)	13.6	13.6		13.6	13.6		51.4	51.4		59.4	51.4	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.57	0.57		0.66	0.57	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	248		204	239		291	2002		445	2018	
v/s Ratio Prot		0.01			0.02			c0.26		c0.04	0.26	
v/s Ratio Perm	c0.11			0.06			0.02			0.24		
v/c Ratio	0.73	0.08		0.41	0.13		0.04	0.46		0.42	0.45	
Uniform Delay, d1	36.4	32.8		34.6	33.1		8.5	11.2		6.2	11.1	
Progression Factor	1.00	1.00		1.00	1.00		0.53	0.59		1.00	1.00	
Incremental Delay, d2	13.1	0.1		1.3	0.2		0.3	0.7		0.6	0.7	
Delay (s)	49.6	32.9		35.9	33.3		4.8	7.4		6.9	11.9	
Level of Service	D	C		D	C		A	A		A	B	
Approach Delay (s)		44.6			34.2			7.3			11.0	
Approach LOS		D			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	77.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
3: Brant Street & Ghent Street

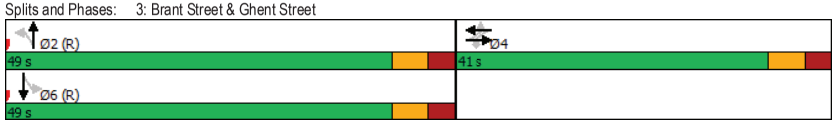
Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	14	18	15	34	38	11	712	11	43	963	120
Future Volume (vph)	159	14	18	15	34	38	11	712	11	43	963	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		25.0	0.0		0.0	45.0		0.0	30.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		0.99		1.00	1.00		0.99	0.99	
Frt			0.850		0.941			0.998			0.983	
Flt Protected		0.956			0.992		0.950			0.950		
Satd. Flow (prot)	0	1816	1615	0	1761	0	1805	3564	0	1687	3496	0
Flt Permitted		0.740			0.922		0.202			0.341		
Satd. Flow (perm)	0	1401	1579	0	1634	0	382	3564	0	597	3496	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		41			2			20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		177.0			166.8			87.4			144.7	
Travel Time (s)		12.7			12.0			6.3			10.4	
Confl. Peds. (#/hr)	5		12	12		5	20		29	29		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	7%	1%	0%
Adj. Flow (vph)	171	15	19	16	37	41	12	766	12	46	1035	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	186	19	0	94	0	12	778	0	46	1164	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		18.5	18.5		18.5		57.5	57.5		57.5	57.5	
Actuated g/C Ratio		0.21	0.21		0.21		0.64	0.64		0.64	0.64	
v/c Ratio		0.65	0.05		0.25		0.05	0.34		0.12	0.52	
Control Delay		42.2	1.5		18.2		6.3	6.6		6.8	6.8	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		42.2	1.5		18.2		6.3	6.6		6.8	6.9	
LOS		D	A		B		A	A		A	A	
Approach Delay		38.4			18.2			6.6			6.8	
Approach LOS		D			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 10.0		Intersection LOS: B	
Intersection Capacity Utilization 70.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Brant Street & Ghent Street



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	186	19	94	12	778	46	1164
v/c Ratio	0.65	0.05	0.25	0.05	0.34	0.12	0.52
Control Delay	42.2	1.5	18.2	6.3	6.6	6.8	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	1.5	18.2	6.3	6.6	6.8	6.9
Queue Length 50th (m)	31.2	0.0	8.0	0.4	14.7	2.2	31.5
Queue Length 95th (m)	47.8	1.3	18.8	2.1	25.0	m5.9	41.6
Internal Link Dist (m)	153.0		142.8		63.4		120.7
Turn Bay Length (m)		25.0		45.0		30.0	
Base Capacity (vph)	529	626	642	243	2276	381	2239
Starvation Cap Reductn	0	0	0	0	0	0	62
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.03	0.15	0.05	0.34	0.12	0.53

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	14	18	15	34	38	11	712	11	43	963	120
Future Volume (vph)	159	14	18	15	34	38	11	712	11	43	963	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		0.99	1.00		0.98	1.00	
Frt		1.00	0.85		0.94		1.00	1.00		1.00	0.98	
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1810	1579		1758		1795	3563		1660	3498	
Flt Permitted		0.74	1.00		0.92		0.20	1.00		0.34	1.00	
Satd. Flow (perm)		1401	1579		1634		382	3563		596	3498	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	171	15	19	16	37	41	12	766	12	46	1035	129
RTOR Reduction (vph)	0	0	15	0	33	0	0	1	0	0	7	0
Lane Group Flow (vph)	0	186	4	0	61	0	12	777	0	46	1157	0
Confl. Peds. (#/hr)	5		12	12		5	20		29	29		20
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	7%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Actuated Green, G (s)		18.5	18.5		18.5		57.5	57.5		57.5	57.5	
Effective Green, g (s)		18.5	18.5		18.5		57.5	57.5		57.5	57.5	
Actuated g/C Ratio		0.21	0.21		0.21		0.64	0.64		0.64	0.64	
Clearance Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		287	324		335		244	2276		380	2234	
v/s Ratio Prot								0.22			c0.33	
v/s Ratio Perm		c0.13	0.00		0.04		0.03			0.08		
v/c Ratio		0.65	0.01		0.18		0.05	0.34		0.12	0.52	
Uniform Delay, d1		32.8	28.5		29.5		6.1	7.5		6.4	8.8	
Progression Factor		1.00	1.00		1.00		0.68	0.73		0.72	0.62	
Incremental Delay, d2		5.0	0.0		0.3		0.4	0.4		0.6	0.8	
Delay (s)		37.7	28.5		29.8		4.5	5.9		5.2	6.2	
Level of Service		D	C		C		A	A		A	A	
Approach Delay (s)		36.9			29.8			5.9			6.2	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	70.8%	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)	18	2	21	0	0	7	33	750	1	27	920	49
Future Volume (vph)	18	2	21	0	0	7	33	750	1	27	920	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.931			0.865						0.992	
Flt Protected		0.978					0.950			0.950		
Satd. Flow (prot)	0	1692	0	0	1442	0	1805	3539	0	1805	1846	0
Flt Permitted		0.978					0.950			0.950		
Satd. Flow (perm)	0	1692	0	0	1442	0	1805	3539	0	1805	1846	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		104.9			57.0			58.9			95.8	
Travel Time (s)		7.6			4.1			4.2			6.9	
Confl. Peds. (#/hr)							14		30	30		14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	50%	0%	0%	0%	14%	0%	2%	0%	0%	2%	4%
Adj. Flow (vph)	20	2	23	0	0	8	36	815	1	29	1000	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	45	0	0	8	0	36	816	0	29	1053	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	2	21	0	0	7	33	750	1	27	920	49
Future Volume (Veh/h)	18	2	21	0	0	7	33	750	1	27	920	49
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	2	23	0	0	8	36	815	1	29	1000	53
Pedestrians		14			30							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			3							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								136			183	
pX, platoon unblocked	0.40	0.40	0.38	0.40	0.40	0.96	0.38			0.96		
vC, conflicting volume	1586	2016	1040	2000	2042	438	1067			846		
vC1, stage 1 conf vol	1098	1098		918	918							
vC2, stage 2 conf vol	488	918		1082	1125							
vCu, unblocked vol	1311	2388	285	2346	2453	323	355			749		
tC, single (s)	7.5	7.5	6.9	7.5	6.5	7.2	4.1			4.1		
tC, 2 stage (s)	6.5	6.5		6.5	5.5							
tF (s)	3.5	4.5	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	89	98	91	100	100	99	92			96		
cM capacity (veh/h)	188	126	268	135	137	596	454			811		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	45	8	36	543	273	29	1053
Volume Left	20	0	36	0	0	29	0
Volume Right	23	8	0	0	1	0	53
cSH	216	596	454	1700	1700	811	1700
Volume to Capacity	0.21	0.01	0.08	0.32	0.16	0.04	0.62
Queue Length 95th (m)	6.1	0.3	2.1	0.0	0.0	0.9	0.0
Control Delay (s)	26.0	11.1	13.6	0.0	0.0	9.6	0.0
Lane LOS	D	B	B			A	
Approach Delay (s)	26.0	11.1	0.6			0.3	
Approach LOS	D	B					

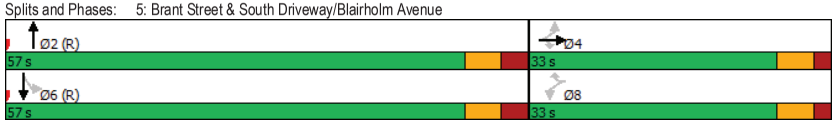
Intersection Summary							
Average Delay			1.0				
Intersection Capacity Utilization			67.2%	ICU Level of Service			C
Analysis Period (min)			15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	4	17	37	0	84	0	676	11	27	619	0
Future Volume (vph)	24	4	17	37	0	84	0	676	11	27	619	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	0		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.98	0.94	0.97		0.97						
Frt			0.850			0.850		0.998				
Flt Protected		0.959		0.950						0.950		
Satd. Flow (prot)	0	1732	1615	1703	0	1553	0	3500	0	1805	1845	0
Flt Permitted		0.959		0.738						0.376		
Satd. Flow (perm)	0	1704	1526	1277	0	1505	0	3500	0	714	1845	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48			88		3				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.3			100.7			228.8			77.4	
Travel Time (s)		4.3			7.3			16.5			5.6	
Confl. Peds. (#/hr)	14		16	16		14	13					13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	0%	0%	6%	0%	4%	0%	3%	0%	0%	3%	0%
Adj. Flow (vph)	25	4	18	39	0	88	0	712	12	28	652	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	29	18	39	0	88	0	724	0	28	652	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1		1		2		1	2	
Detector Template	Left	Thru	Right	Left		Right		Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0		2.0		10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0		2.0		0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	4	8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0		8.0		8.0		8.0	8.0	
Minimum Split (s)	26.0	26.0	26.0	26.0		26.0		40.5		40.5	40.5	
Total Split (s)	33.0	33.0	33.0	33.0		33.0		57.0		57.0	57.0	
Total Split (%)	36.7%	36.7%	36.7%	36.7%		36.7%		63.3%		63.3%	63.3%	
Maximum Green (s)	27.0	27.0	27.0	27.0		27.0		50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0		4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0		3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Recall Mode	None	None	None	None		None		C-Max		C-Max	C-Max	
Walk Time (s)	10.0	10.0	10.0	10.0		10.0		25.0		25.0	25.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0		10.0		8.0		8.0	8.0	
Pedestrian Calls (#/hr)	0	0	0	0		0		0		0	0	
Act Effct Green (s)		9.1	9.1	9.1		9.1		72.1		72.1	72.1	
Actuated g/C Ratio		0.10	0.10	0.10		0.10		0.80		0.80	0.80	
v/c Ratio		0.17	0.09	0.30		0.38		0.26		0.05	0.44	
Control Delay		38.6	2.2	43.4		13.5		5.6		7.3	9.4	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		38.6	2.2	43.4		13.5		5.6		7.3	9.4	
LOS		D	A	D		B		A		A	A	
Approach Delay		24.7			22.7			5.6			9.3	
Approach LOS		C			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 73 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 9.1		Intersection LOS: A	
Intersection Capacity Utilization 64.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Brant Street & South Driveway/Blairholm Avenue



Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	29	18	39	88	724	28	652
v/c Ratio	0.17	0.09	0.30	0.38	0.26	0.05	0.44
Control Delay	38.6	2.2	43.4	13.5	5.6	7.3	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.6	2.2	43.4	13.5	5.6	7.3	9.4
Queue Length 50th (m)	5.0	0.0	6.8	0.0	31.3	1.9	62.5
Queue Length 95th (m)	13.0	1.3	16.3	13.4	42.1	m5.0	92.4
Internal Link Dist (m)	35.3				204.8		53.4
Turn Bay Length (m)			15.0			15.0	
Base Capacity (vph)	511	491	383	513	2805	572	1478
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.04	0.10	0.17	0.26	0.05	0.44

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	4	17	37	0	84	0	676	11	27	619	0
Future Volume (vph)	24	4	17	37	0	84	0	676	11	27	619	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00	1.00		1.00		0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.94	1.00		0.97		1.00		1.00	1.00	
Flpb, ped/bikes		0.98	1.00	0.97		1.00		1.00		1.00	1.00	
Frt		1.00	0.85	1.00		0.85		1.00		1.00	1.00	
Flt Protected		0.96	1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1704	1526	1644		1505		3498		1805	1845	
Flt Permitted		0.96	1.00	0.74		1.00		1.00		0.38	1.00	
Satd. Flow (perm)		1704	1526	1278		1505		3498		715	1845	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	4	18	39	0	88	0	712	12	28	652	0
RTOR Reduction (vph)	0	0	17	0	0	81	0	1	0	0	0	0
Lane Group Flow (vph)	0	29	2	39	0	7	0	723	0	28	652	0
Confl. Peds. (#/hr)	14		16	16		14	13					13
Heavy Vehicles (%)	6%	0%	0%	6%	0%	4%	0%	3%	0%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Actuated Green, G (s)		7.5	7.5	7.5		7.5		69.5		69.5	69.5	
Effective Green, g (s)		7.5	7.5	7.5		7.5		69.5		69.5	69.5	
Actuated g/C Ratio		0.08	0.08	0.08		0.08		0.77		0.77	0.77	
Clearance Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		142	127	106		125		2701		552	1424	
v/s Ratio Prot								0.21			c0.35	
v/s Ratio Perm		0.02	0.00	c0.03		0.00				0.04		
v/c Ratio		0.20	0.01	0.37		0.06		0.27		0.05	0.46	
Uniform Delay, d1		38.5	37.8	39.0		38.0		2.9		2.4	3.6	
Progression Factor		1.00	1.00	1.00		1.00		1.69		2.19	2.09	
Incremental Delay, d2		0.7	0.0	2.2		0.2		0.2		0.2	0.9	
Delay (s)		39.2	37.9	41.2		38.2		5.2		5.5	8.5	
Level of Service		D	D	D		D		A		A	A	
Approach Delay (s)		38.7			39.1			5.2			8.4	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			

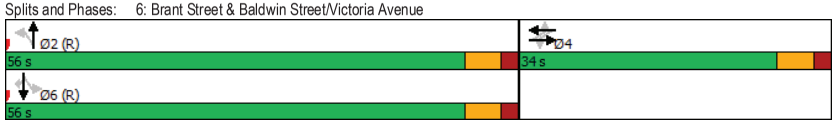
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	14	8	9	6	54	11	562	11	46	469	47
Future Volume (vph)	67	14	8	9	6	54	11	562	11	46	469	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	40.0		0.0	15.0		0.0	45.0		50.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. 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
Ped Bike Factor	0.98	0.98		0.96	0.97		0.96	1.00		0.97		0.88
Frt		0.944			0.866			0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1713	0	1517	1459	0	1805	1745	0	1570	1727	1615
Flt Permitted	0.714			0.742			0.459			0.396		
Satd. Flow (perm)	1284	1713	0	1135	1459	0	834	1745	0	636	1727	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			59			2				51
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		105.7			113.2			98.7			228.8	
Travel Time (s)		9.5			10.2			7.1			16.5	
Confl. Peds. (#/hr)	16		24	24		16	79		64	64		79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	6%	19%	0%	11%	0%	8%	27%	15%	10%	0%
Adj. Flow (vph)	73	15	9	10	7	59	12	611	12	50	510	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	24	0	10	66	0	12	623	0	50	510	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Detector Phase	4	4		4	4		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	32.0	32.0		32.0	32.0		42.0	42.0		42.0	42.0	42.0
Total Split (s)	34.0	34.0		34.0	34.0		56.0	56.0		56.0	56.0	56.0
Total Split (%)	37.8%	37.8%		37.8%	37.8%		62.2%	62.2%		62.2%	62.2%	62.2%
Maximum Green (s)	28.0	28.0		28.0	28.0		50.0	50.0		50.0	50.0	50.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	25.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	10.9	10.9		10.9	10.9		71.1	71.1		71.1	71.1	71.1
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.79	0.79		0.79	0.79	0.79
v/c Ratio	0.47	0.11		0.07	0.29		0.02	0.45		0.10	0.37	0.05
Control Delay	46.0	25.6		34.1	14.7		3.9	5.8		4.2	4.0	2.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	46.0	25.6		34.1	14.7		3.9	5.8		4.2	4.0	2.1
LOS	D	C		C	B		A	A		A	A	A
Approach Delay		40.9			17.2			5.8			3.8	
Approach LOS		D			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 36 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 8.0		Intersection LOS: A	
Intersection Capacity Utilization 64.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Brant Street & Baldwin Street/Victoria Avenue



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	73	24	10	66	12	623	50	510	51
v/c Ratio	0.47	0.11	0.07	0.29	0.02	0.45	0.10	0.37	0.05
Control Delay	46.0	25.6	34.1	14.7	3.9	5.8	4.2	4.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	25.6	34.1	14.7	3.9	5.8	4.2	4.0	2.1
Queue Length 50th (m)	12.6	2.5	1.6	1.2	0.5	35.4	0.3	2.6	0.0
Queue Length 95th (m)	25.1	9.3	6.2	12.4	2.2	69.1	6.4	38.8	2.8
Internal Link Dist (m)		81.7		89.2		74.7		204.8	
Turn Bay Length (m)	15.0		40.0		15.0		45.0		50.0
Base Capacity (vph)	399	539	353	494	658	1378	502	1363	1129
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.04	0.03	0.13	0.02	0.45	0.10	0.37	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	14	8	9	6	54	11	562	11	46	469	47
Future Volume (vph)	67	14	8	9	6	54	11	562	11	46	469	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	1.00		1.00	1.00	0.88
Flpb, ped/bikes	0.98	1.00		0.96	1.00		0.95	1.00		0.97	1.00	1.00
Frt	1.00	0.94		1.00	0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1708	1713		1453	1459		1715	1745		1518	1727	1417
Flt Permitted	0.71	1.00		0.74	1.00		0.46	1.00		0.40	1.00	1.00
Satd. Flow (perm)	1284	1713		1135	1459		829	1745		632	1727	1417
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)	73	15	9	10	7	59	12	611	12	50	510	51
RTOR Reduction (vph)	0	8	0	0	53	0	0	0	0	0	0	12
Lane Group Flow (vph)	73	16	0	10	13	0	12	623	0	50	510	39
Confl. Peds. (#/hr)	16		24	24		16	79		64	64		79
Heavy Vehicles (%)	4%	0%	6%	19%	0%	11%	0%	8%	27%	15%	10%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)	9.3	9.3		9.3	9.3		68.7	68.7		68.7	68.7	68.7
Effective Green, g (s)	9.3	9.3		9.3	9.3		68.7	68.7		68.7	68.7	68.7
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.76	0.76		0.76	0.76	0.76
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	132	177		117	150		632	1332		482	1318	1081
v/s Ratio Prot		0.01			0.01			c0.36			0.30	
v/s Ratio Perm	c0.06			0.01			0.01			0.08		0.03
v/c Ratio	0.55	0.09		0.09	0.09		0.02	0.47		0.10	0.39	0.04
Uniform Delay, d1	38.4	36.5		36.5	36.5		2.6	3.9		2.7	3.6	2.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.97	0.75	1.60
Incremental Delay, d2	4.9	0.2		0.3	0.3		0.1	1.2		0.4	0.8	0.1
Delay (s)	43.3	36.7		36.8	36.8		2.6	5.1		3.0	3.5	4.2
Level of Service	D	D		D	D		A	A		A	A	A
Approach Delay (s)		41.7			36.8			5.1			3.5	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	784	646	0
Future Volume (vph)	0	0	0	784	646	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	15.0			0.0
Storage Lanes	0	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	1863	3505	1845	0
Flt Permitted						
Satd. Flow (perm)	0	0	1863	3505	1845	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.1			77.4	58.9	
Travel Time (s)	3.6			5.6	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	0	0	0	852	702	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	852	702	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	784	646	0
Future Volume (Veh/h)	0	0	0	784	646	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	852	702	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				77	242	
pX, platoon unblocked	0.82	0.79	0.79			
vC, conflicting volume	1128	702	702			
vC1, stage 1 conf vol	702					
vC2, stage 2 conf vol	426					
vCu, unblocked vol	790	487	487			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	426	415	845			

Direction, Lane #	NB 1	NB 2	NB 3	SB 1
Volume Total	0	426	426	702
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.25	0.25	0.41
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			0.0
Approach LOS				

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		37.3%	ICU Level of Service
Analysis Period (min)		15	

Intersection: 1: Brant Street & Fairview Street

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	213.4	107.5	90.3	18.7	82.4	197.6	175.3	47.0	88.4	105.7	95.9	85.6
Average Queue (m)	132.7	58.5	48.4	1.1	60.5	113.1	104.8	7.0	47.0	55.0	57.5	7.3
95th Queue (m)	250.4	93.5	74.5	10.3	102.3	172.3	159.4	31.7	80.8	89.3	86.7	41.7
Link Distance (m)	313.0	313.0	313.0			336.1	336.1	336.1		266.9	266.9	
Upstream Blk Time (%)	0											
Queuing Penalty (veh)	0											
Storage Bay Dist (m)				190.0	75.0				85.0			80.0
Storage Blk Time (%)					1	25			2	1	1	0
Queuing Penalty (veh)					3	52			7	2	2	0

Intersection: 1: Brant Street & Fairview Street

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	62.4	120.2	99.8	29.6
Average Queue (m)	42.9	64.7	47.5	7.1
95th Queue (m)	72.8	100.3	81.4	22.4
Link Distance (m)		224.1	224.1	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	55.0			90.0
Storage Blk Time (%)	2	16	0	
Queuing Penalty (veh)	4	28	0	

Intersection: 2: Brant Street & Grahams Lane/Prospect Street

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	47.1	81.4	27.3	69.2	14.5	52.8	58.7	27.4	141.1	112.5
Average Queue (m)	28.3	18.0	14.2	18.7	1.7	20.2	23.5	21.7	58.9	41.3
95th Queue (m)	48.9	56.8	27.5	44.8	7.9	40.8	45.6	33.5	119.1	94.0
Link Distance (m)		140.7		228.0		121.8	121.8		266.9	266.9
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	40.0		20.0		20.0			20.0		
Storage Blk Time (%)	12	0	14	7	0	6		8	27	
Queuing Penalty (veh)	7	1	19	5	0	1		32	47	

Intersection: 3: Brant Street & Ghent Street

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	61.7	27.7	31.3	13.7	38.9	40.6	37.4	134.1	135.1
Average Queue (m)	29.2	4.7	12.8	2.5	12.7	15.0	13.5	91.9	69.7
95th Queue (m)	51.2	17.7	25.8	9.1	27.8	29.9	34.9	145.0	145.8
Link Distance (m)	163.0		152.7		67.2	67.2		121.8	121.8
Upstream Blk Time (%)								5	2
Queuing Penalty (veh)								25	8
Storage Bay Dist (m)		25.0		45.0			30.0		
Storage Blk Time (%)	14	0			0		0	33	
Queuing Penalty (veh)	2	0			0		0	14	

Intersection: 4: Brant Street & Olga Drive/Rambo Crescent

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (m)	17.9	12.4	18.1	8.8	13.6
Average Queue (m)	7.9	2.1	4.3	2.8	0.6
95th Queue (m)	16.2	9.0	13.1	8.8	6.5
Link Distance (m)	93.5	41.8			77.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			20.0	15.0	
Storage Blk Time (%)			0	0	0
Queuing Penalty (veh)			1	1	0

Intersection: 5: Brant Street & South Driveway/Blairholm Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	R	T	TR	L	T
Maximum Queue (m)	19.8	10.1	20.0	37.7	46.0	47.0	22.2	63.8
Average Queue (m)	7.2	3.4	9.0	11.4	19.4	17.3	5.4	46.5
95th Queue (m)	17.1	10.4	18.9	23.5	39.7	37.8	17.6	76.1
Link Distance (m)	47.9	47.9		87.0	203.2	203.2		62.4
Upstream Blk Time (%)								2
Queuing Penalty (veh)								13
Storage Bay Dist (m)			15.0				15.0	
Storage Blk Time (%)			9	2			0	18
Queuing Penalty (veh)			7	1			1	5

Intersection: 6: Brant Street & Baldwin Street/Victoria Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (m)	21.6	25.3	17.2	24.8	10.1	94.5	47.4	118.1	38.9
Average Queue (m)	10.7	4.1	2.1	10.9	1.6	43.8	11.2	44.8	6.4
95th Queue (m)	20.9	14.3	9.7	21.5	7.3	82.5	30.8	92.0	25.1
Link Distance (m)		91.1		99.4		88.1		203.2	
Upstream Blk Time (%)						1			
Queuing Penalty (veh)						0			
Storage Bay Dist (m)	15.0		40.0		15.0		45.0		50.0
Storage Blk Time (%)	10	0		0	0	19	0	7	0
Queuing Penalty (veh)	2	0		0	1	2	0	6	0

Intersection: 7: Brant Street & North Driveway

Movement	SB
Directions Served	TR
Maximum Queue (m)	39.6
Average Queue (m)	6.3
95th Queue (m)	24.6
Link Distance (m)	40.4
Upstream Blk Time (%)	0
Queuing Penalty (veh)	2
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 303

Appendix D

ITE Trip Capture

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	210691 - 688 Brant St	**Organization:**	Paradigm Transportation Solutions Limited
Project Location:	Burlington, ON	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:	Site Generated Traffic	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	-	-	-	0		
Retail	822	17,136	Square Feet	41	25	16
Restaurant	-	-	-	0		
Cinema/Entertainment	-	-	-	0		
Residential	222/220	305	Dwelling Units	110	34	76
Hotel	-	-	-	0		
All Other Land Uses[2]	-	-	-	0		
Total				151	59	92

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	151	59	92
Internal Capture Percentage	3%	3%	2%
External Vehicle-Trips[3]	147	57	90
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	4%	6%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	3%	1%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	210691 - 688 Brant St
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	25	25	1.00	16	16
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	34	34	1.00	76	76
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	5		2	0	2	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	1	15	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		8	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	2		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	4	0	0		0
Hotel	0	1	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	1	24	25	24	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	33	34	33	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	1	15	16	15	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	75	76	75	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	210691 - 688 Brant St	**Organization:**	Paradigm Transportation Solutions Limited
Project Location:	Burlington, ON	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:	Site Generated Traffic	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	-	-	-	0		
Retail	822	17,136	Square Feet	114	57	57
Restaurant	-	-	-	0		
Cinema/Entertainment	-	-	-	0		
Residential	222/220	305	Dwelling Units	125	71	54
Hotel	-	-	-	0		
All Other Land Uses[2]	-	-	-	0		
Total				239	128	111

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	15	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	6	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	239	128	111
Internal Capture Percentage	18%	16%	19%
External Vehicle-Trips[3]	197	107	90
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	11%	26%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	21%	11%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	210691 - 688 Brant St
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	57	57	1.00	57	57
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	71	71	1.00	54	54
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	1		17	2	15	3
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	23	11	0		2
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	0	0	3	0
Retail	0		0	0	33	0
Restaurant	0	29		0	11	0
Cinema/Entertainment	0	2	0		3	0
Residential	0	6	0	0		0
Hotel	0	1	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	6	51	57	51	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	15	56	71	56	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	15	42	57	42	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	6	48	54	48	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Appendix E

TTS Data

TO (OUTBOUND)

Tue Sep 2(020 15:57:59 GMT-0400 Eastern Daylight Time) - Run Time: 2421ms

Cross Tabı tion Query F orm - Trip - 2016 v1.1

Row: 2006 A zone of or igin - gta0 6_orig
Column: 2(GTA zone of destinatio n - gta06_dest

RowG:(4059)
ColG:
TblG:

Filters:
No Filters

Trip 2016
ROW : gtaı orig
COLUMN : 06_dest

gta06_orig	gta06_dest		total
1	3	NB	23
1	35	NB	15
1	36	NB	16
1	37	NB	19
1	51	NB	10
1	56	NB	9
1	63	NB	25
1	68	NB	22
1	89	NB	28
1	113	NB	4
1	212	NB	11
1	267	NB	19
1	292	NB	22
1	314	NB	56
1	316	NB	37
1	371	NB	11
1	2667	NB	10
1	3189	NB	8
1	3199	NB	18
1	3351	NB	12
1	3352	NB	23
1	3370	NB	6
1	3480	NB	9
1	3605	NB	49
1	3614	NB	100
1	3615	NB	47
1	3618	NB	24
1	3638	NB	5
1	3653	NB	4
1	3655	NB	28
1	3660	NB	26
1	3662	NB	12
1	3676	NB	47
1	3704	NB	32
1	3838	NB	19
1	3841	NB	25
1	3879	NB	6
1	4001	SB	90
1	4003	NB	20
1	4004	NB	18
1	4005	NB	39
1	4007	NB	61
1	4008	NB	62
1	4009	NB	30
1	4011	NB	14
1	4012	NB	13
1	4014	NB	25
1	4016	NB	53
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1	4027	NB	63
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1	4029	NB	47
1	4030	NB	6
1	4032	NB	70
1	4036	NB	12
1	4038	NB	18
1	4040	NB	43
1	4041	NB	44
1	4042	NB	58
1	4045	NB	25
1	4050	WF	28
1	4051	WF	174
1	4052	WF	40
1	4053	WF	284
1	4054	WF	187
1	4055	WF	328
1	4056	SB	68
1	4057	WF	1105
1	4058	NB	211
1	4059	EP	1557
1	4060	SB	1188
1	4061	SB	659
1	4062	EF	681
1	4063	EF	559
1	4064	EF	286
1	4065	SB	138
1	4066	SB	46
1	4067	EF	88
1	4068	EF	291
1	4069	EF	116
1	4070	EF	53
1	4071	EF	38
1	4072	SB	43
1	4073	SB	18
1	4074	SB	65
1	4075	SB	25
1	4076	NB	136
1	4077	NB	215
1	4078	NB	249

FROM (INBOUND)

Tue Sep 22 20 20 15:58:2·GMT-0400 Eastern Daylight Time) - Run Time: 2397ms

Cross Tabulat ion Query Iorm - Trip - 2016 v1.1

Row: 2006 GTA zone of or igin - gta0 6_orig
Column: 2006 GTA zone destinatio n - gta06_dest

RowG:
ColG:(4059)
TblG:

Filters:
No Filters

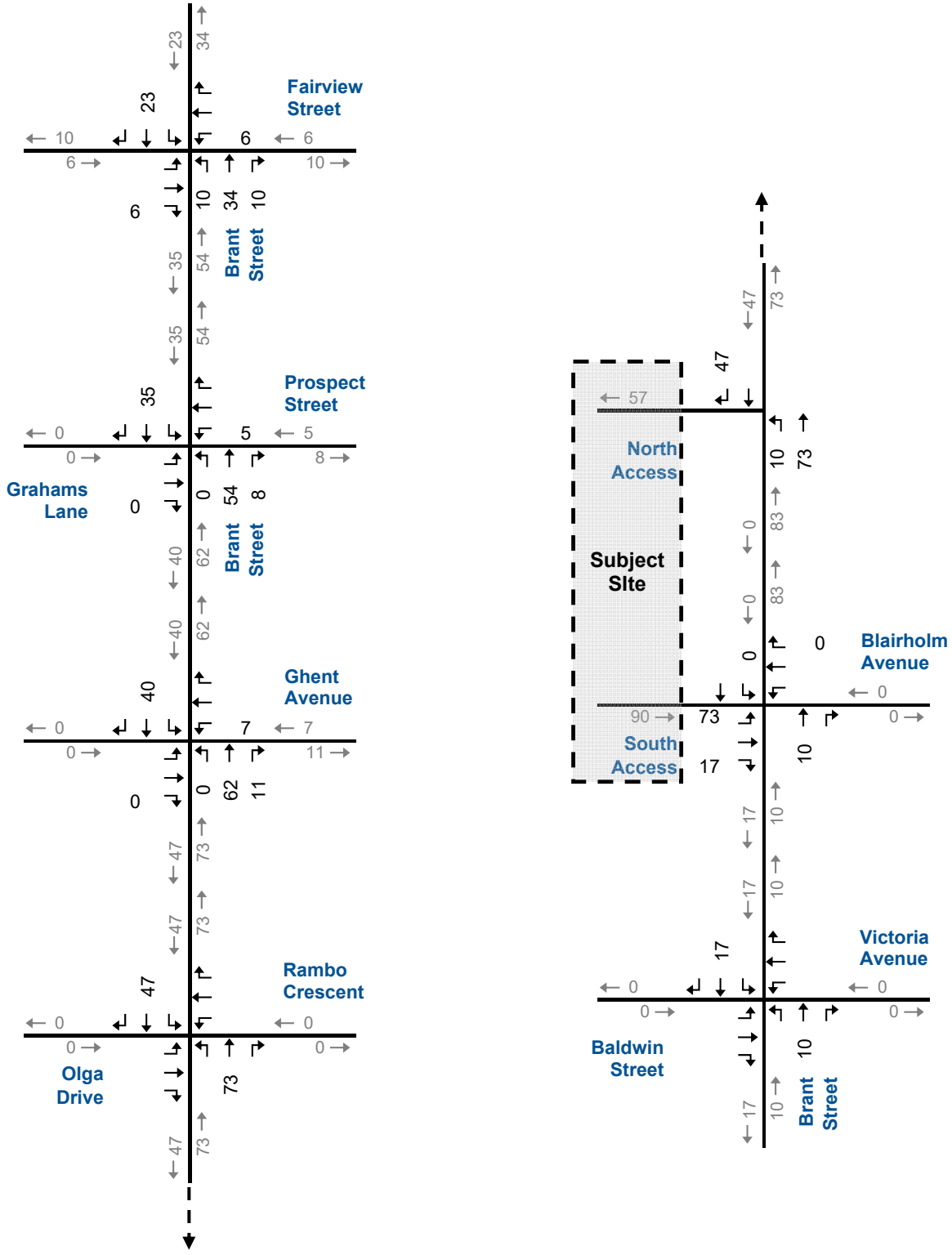
Trip 2016
ROW : gta06_o rig
COLUMN : gta0 6_dest

gta06_orig		gta06_desı	total
3	NB	1	23
25	NB	1	22
35	NB	1	15
36	NB	1	25
51	NB	1	29
56	NB	1	9
63	NB	1	25
68	NB	1	22
89	NB	1	28
109	NB	1	23
113	NB	1	4
292	NB	1	22
310	NB	1	19
314	NB	1	22
316	NB	1	37
350	NB	1	4
2667	NB	1	10
3189	NB	1	8
3199	NB	1	18
3331	NB	1	56
3352	NB	1	23
3370	NB	1	18
3480	NB	1	9
3605	NB	1	49
3614	NB	1	65
3615	NB	1	47
3618	NB	1	24
3621	NB	1	22
3638	NB	1	5
3660	NB	1	26
3662	NB	1	40
3676	NB	1	36
3841	NB	1	25
3862	NB	1	12
3879	NB	1	6
4001	SB	1	103
4002	NB	1	75
4003	NB	1	20
4004	NB	1	21
4005	NB	1	39
4008	NB	1	62
4012	NB	1	4
4014	NB	1	25
4016	NB	1	40
4017	NB	1	16
4025	NB	1	16
4027	NB	1	63
4028	NB	1	31
4029	NB	1	47
4032	NB	1	70
4036	NB	1	12
4041	NB	1	44
4042	NB	1	58
4045	NB	1	39
4050	WF	1	17
4051	WF	1	114
4052	WF	1	76
4053	WF	1	401
4054	WF	1	187
4055	WF	1	229
4056	SB	1	95
4057	WF	1	1014
4058	NB	1	247
4059	EP	1	1557
4060	SB	1	1073
4061	SB	1	594
4062	EF	1	420
4063	EF	1	480
4064	EF	1	415
4065	SB	1	126
4066	SB	1	15
4067	EF	1	175
4068	EF	1	407
4069	EF	1	162
4070	EF	1	53
4071	EF	1	20
4072	SB	1	30
4073	SB	1	41
4074	SB	1	62
4075	SB	1	66
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4079	NB	1	239
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1	4084	NB	219
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1	4087	NB	238
1	4088	NB	199
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1	4090	NB	12
1	4091	WF	27
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1	4096	NB	12
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1	4101	NB	22
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4091	WF	1	13
4093	NB	1	14
4094	NB	1	25
4096	NB	1	12
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4189	NB	1	127
4190	NB	1	99
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5231	NB	1	12
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7087	NB	1	47
7212	NB	1	35
7484	NB	1	12
7523	NB	1	24
8351	NB	1	28
8911	NB	1	10
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8950	NB	1	8
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Appendix F

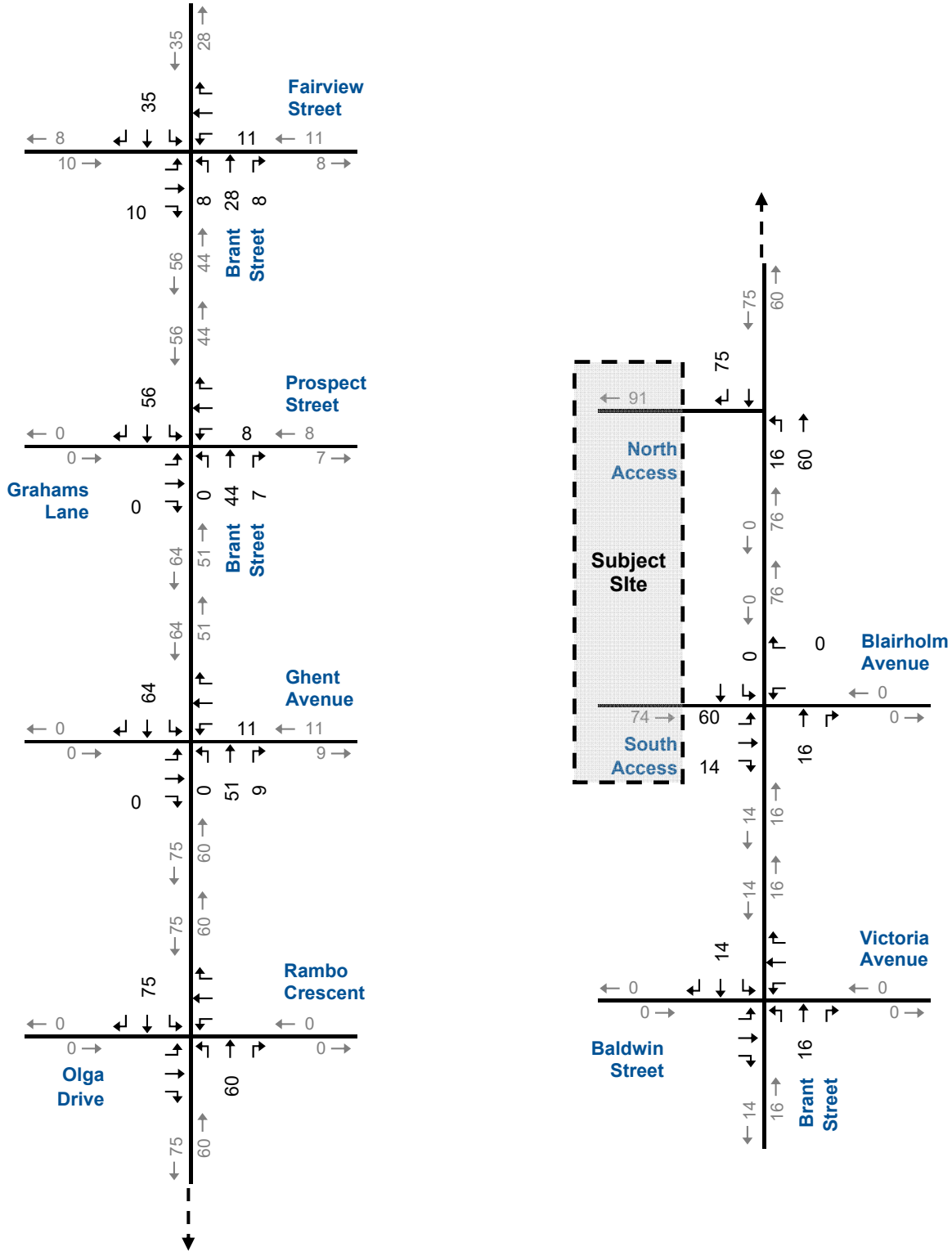
Detailed Trip Assignment



New Site Generated Traffic Volumes AM Peak Hour

688 Brant Street, Burlington
210691

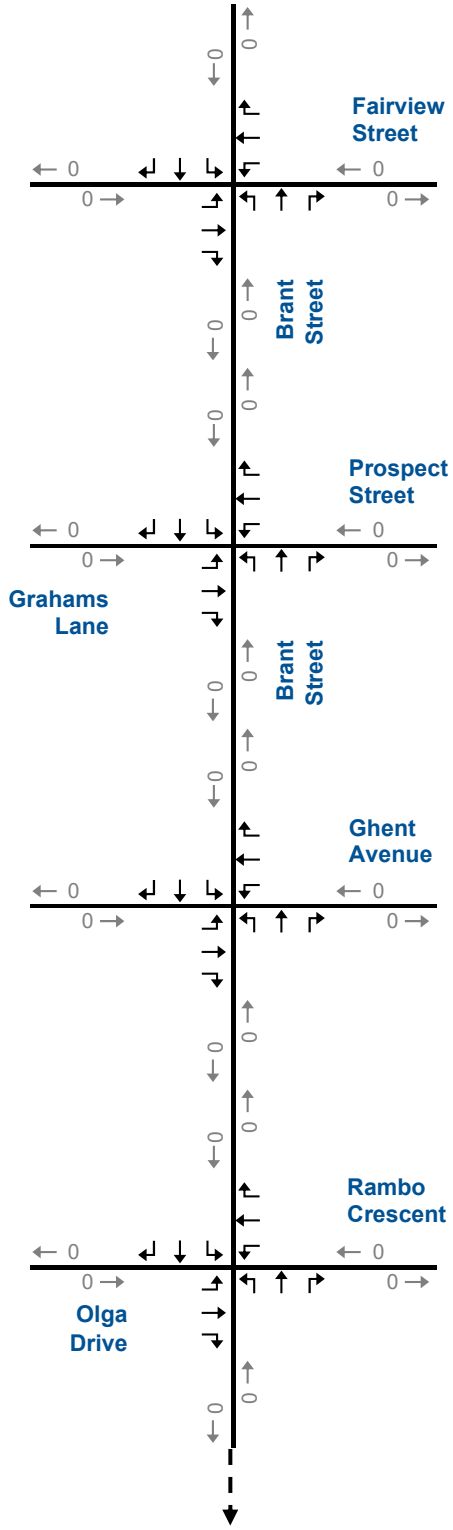
Appendix F

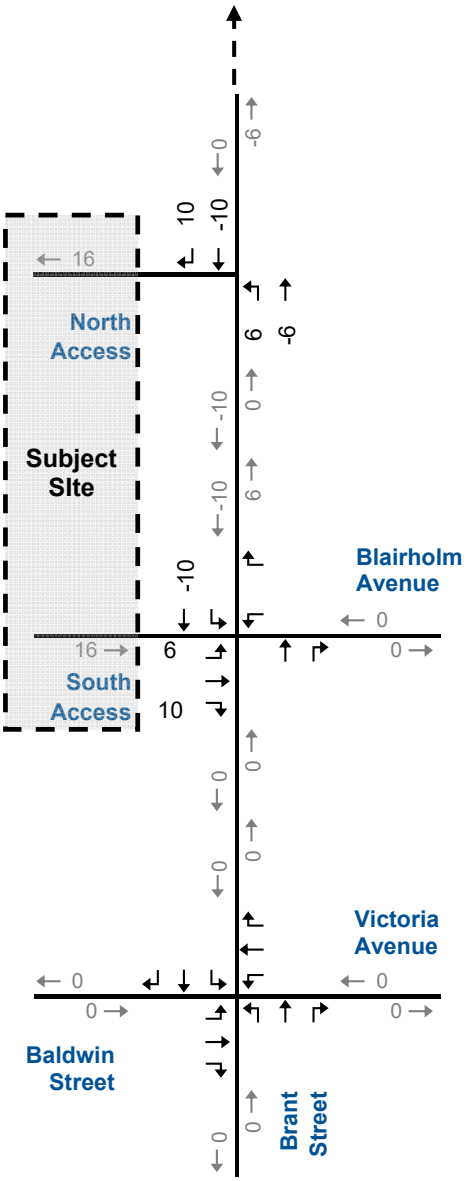


New Site Generated Traffic Volumes PM Peak Hour

688 Brant Street, Burlington
210691

Appendix F





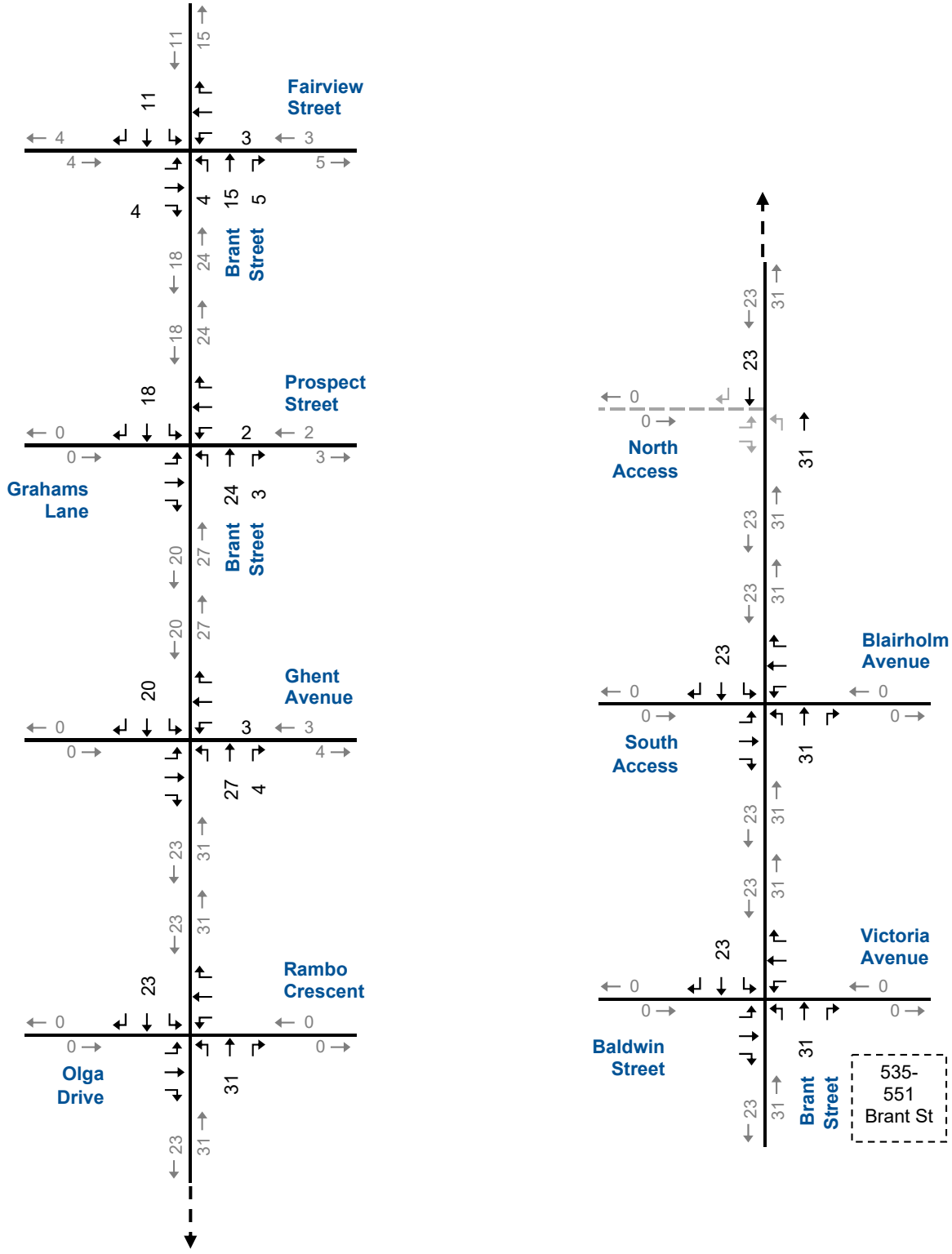
Pass-By Site Generated Traffic Volumes PM Peak Hour

688 Brant Street, Burlington
210691

Appendix F

Appendix G

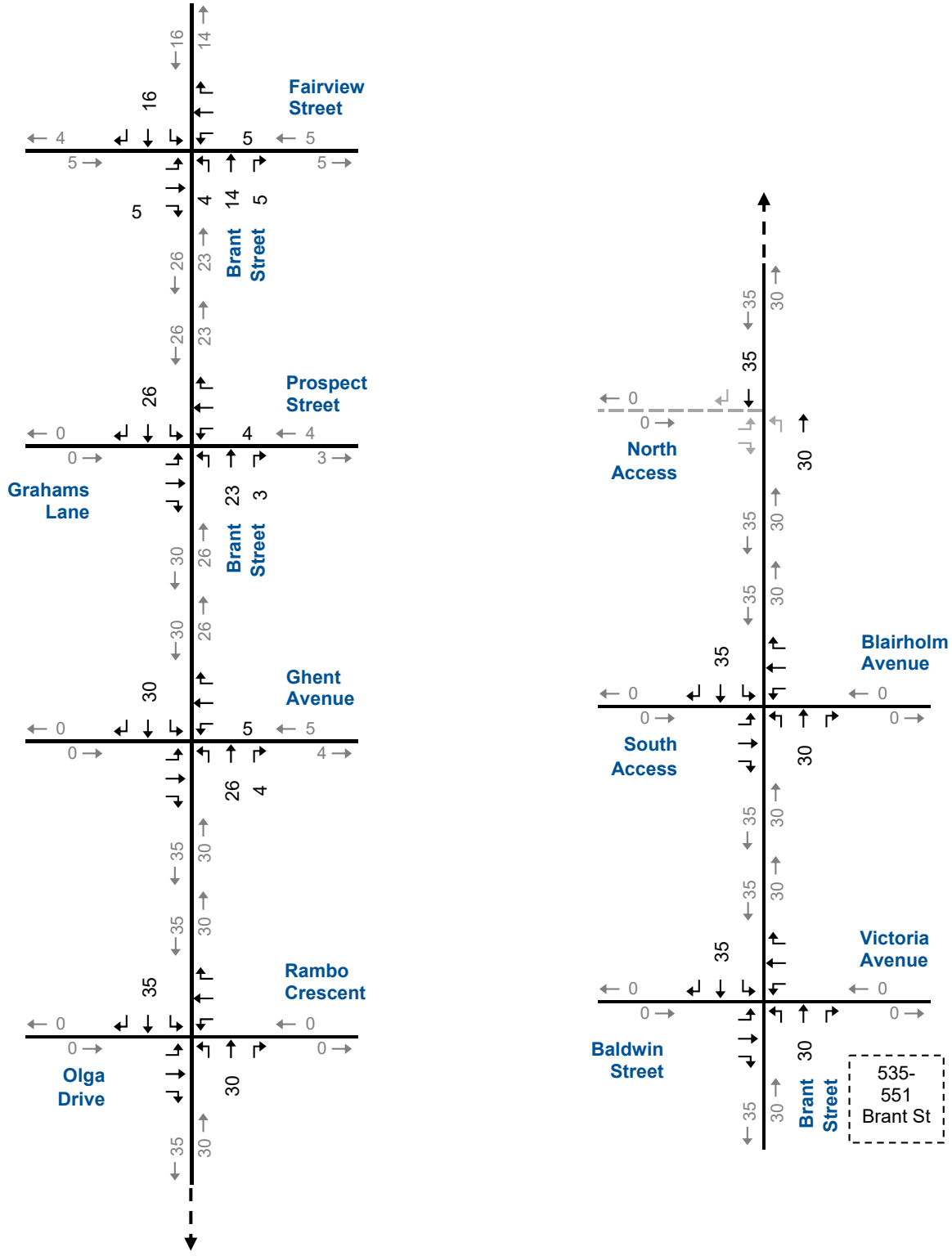
In-Stream Development Traffic Projections



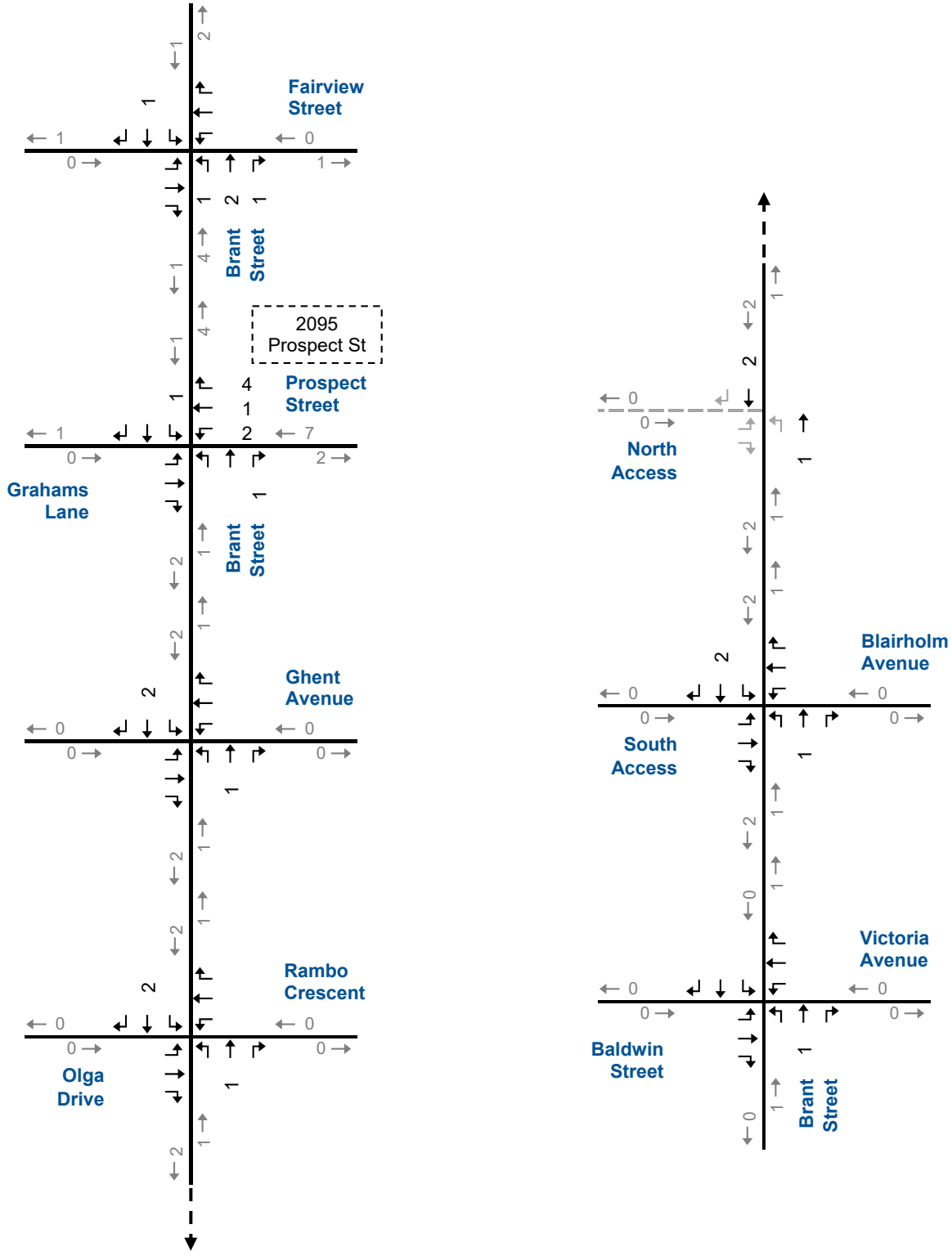
In-Stream Development Traffic Volumes
535-551 Brant Street
AM Peak Hour

688 Brant Street, Burlington
210691

Appendix G



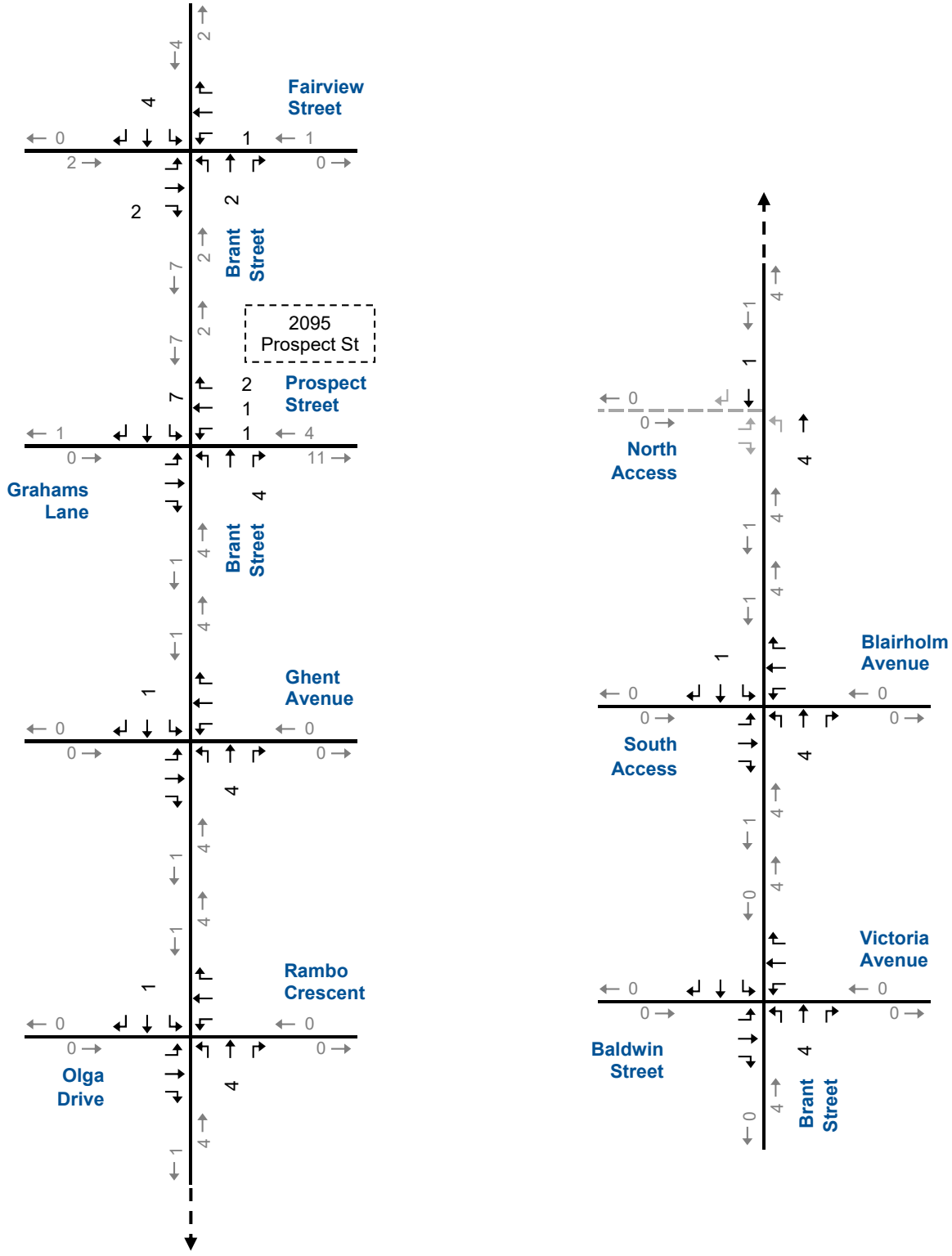
In-Stream Development Traffic Volumes
535-551 Brant Street
PM Peak Hour



In-Stream Development Traffic Volumes
2095 Prospect Street
AM Peak Hour

688 Brant Street, Burlington
210691

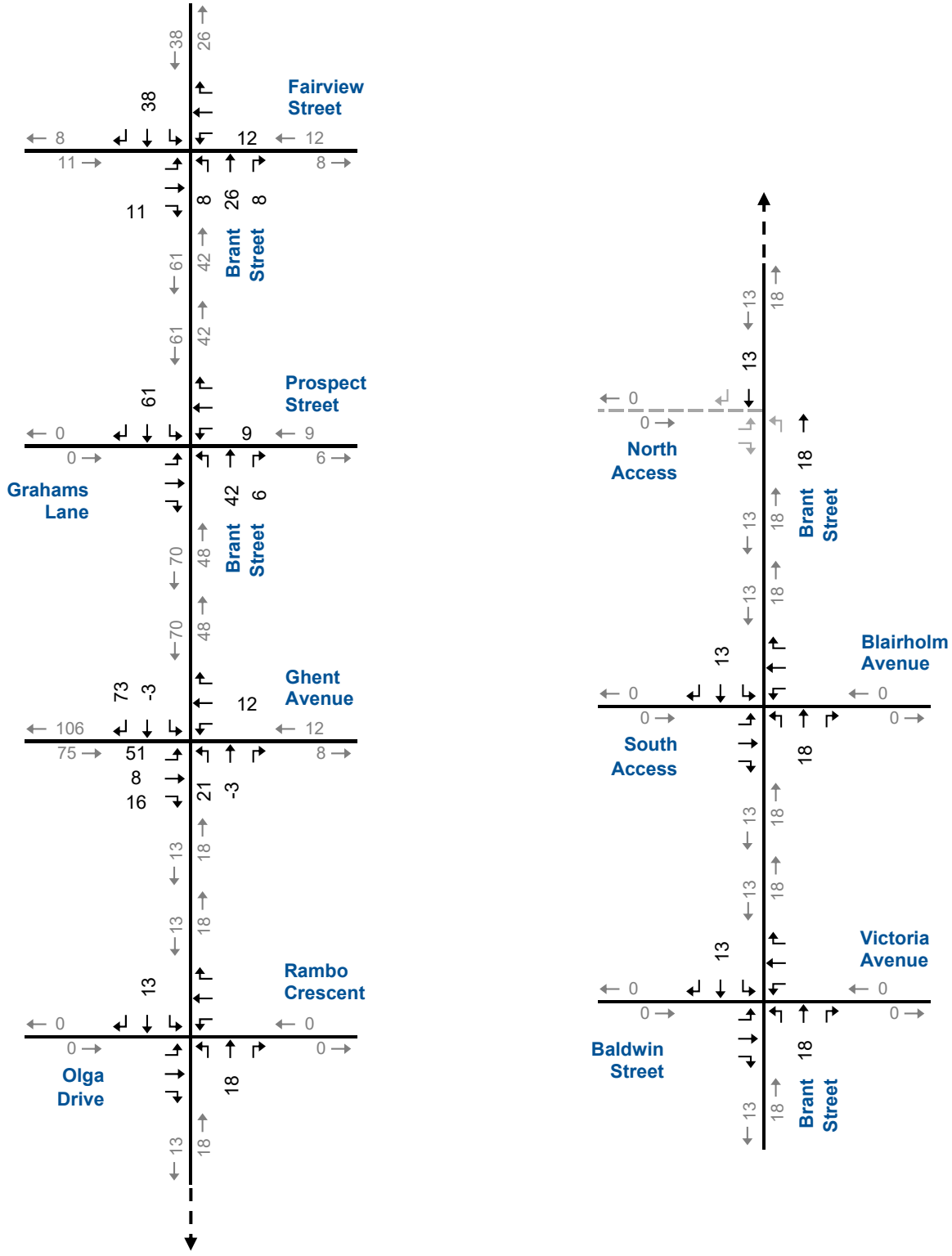
Appendix G



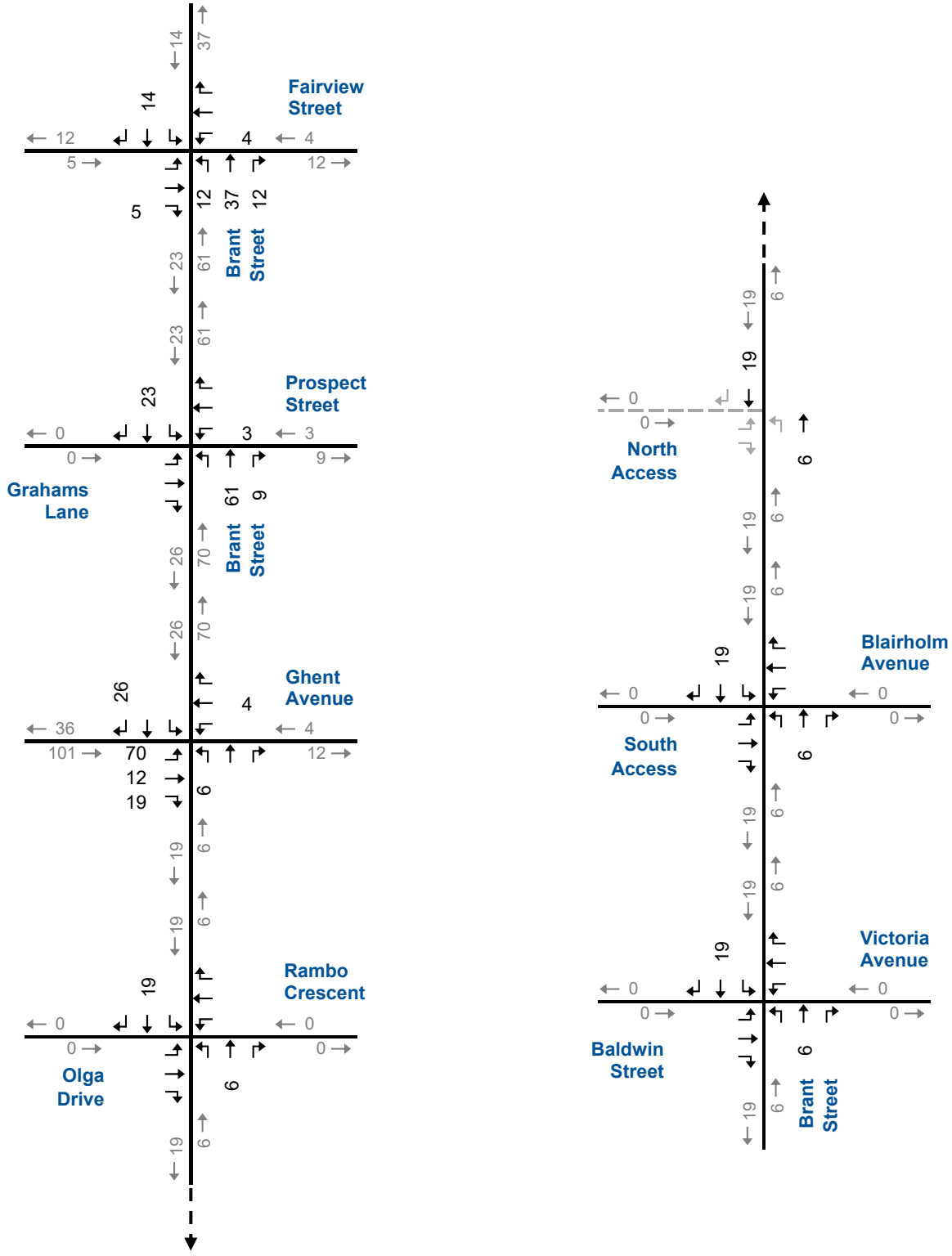
In-Stream Development Traffic Volumes
2095 Prospect Street
PM Peak Hour

688 Brant Street, Burlington
210691

Appendix G



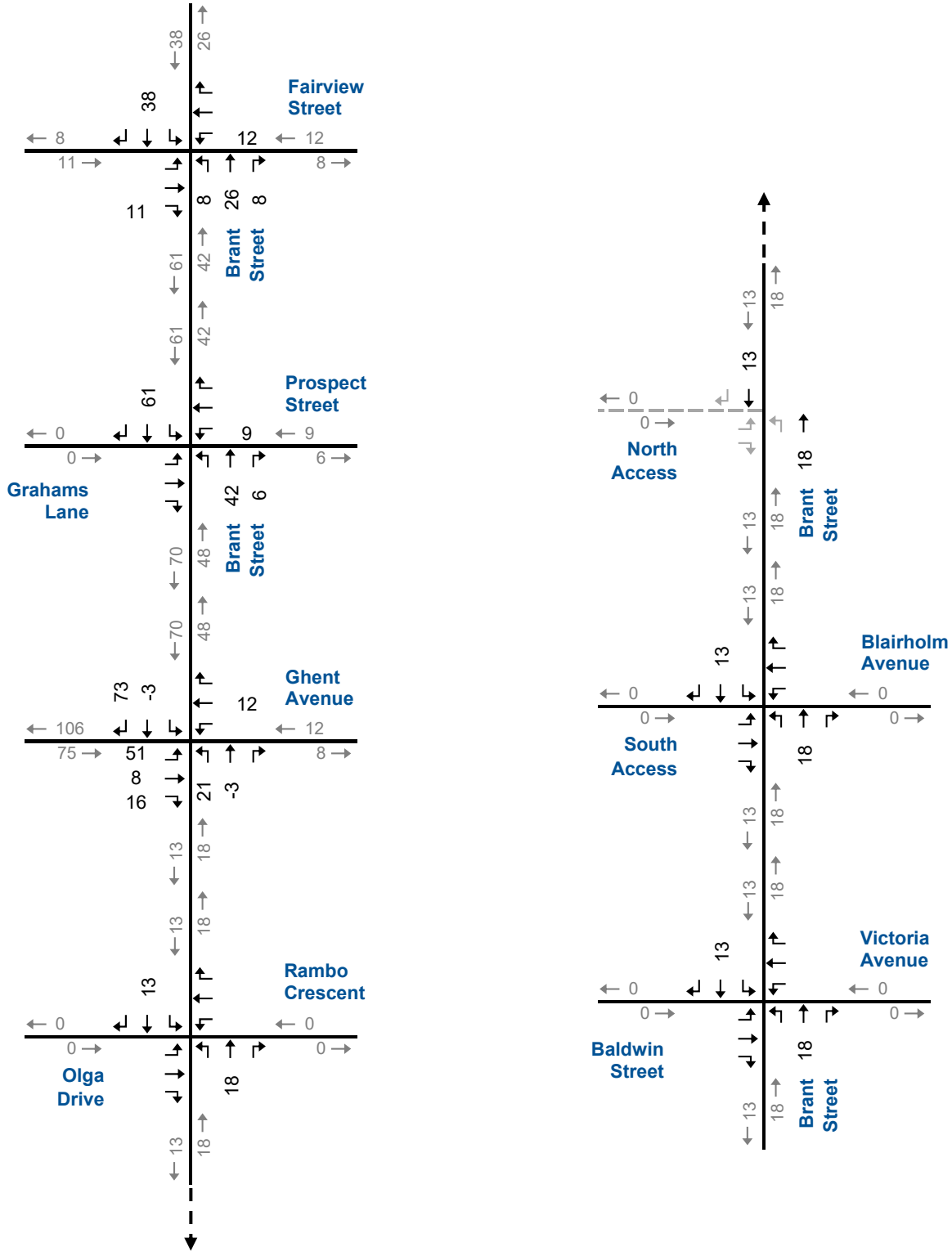
In-Stream Development Traffic Volumes
Brant Street & Ghent Avenue
AM Peak Hour



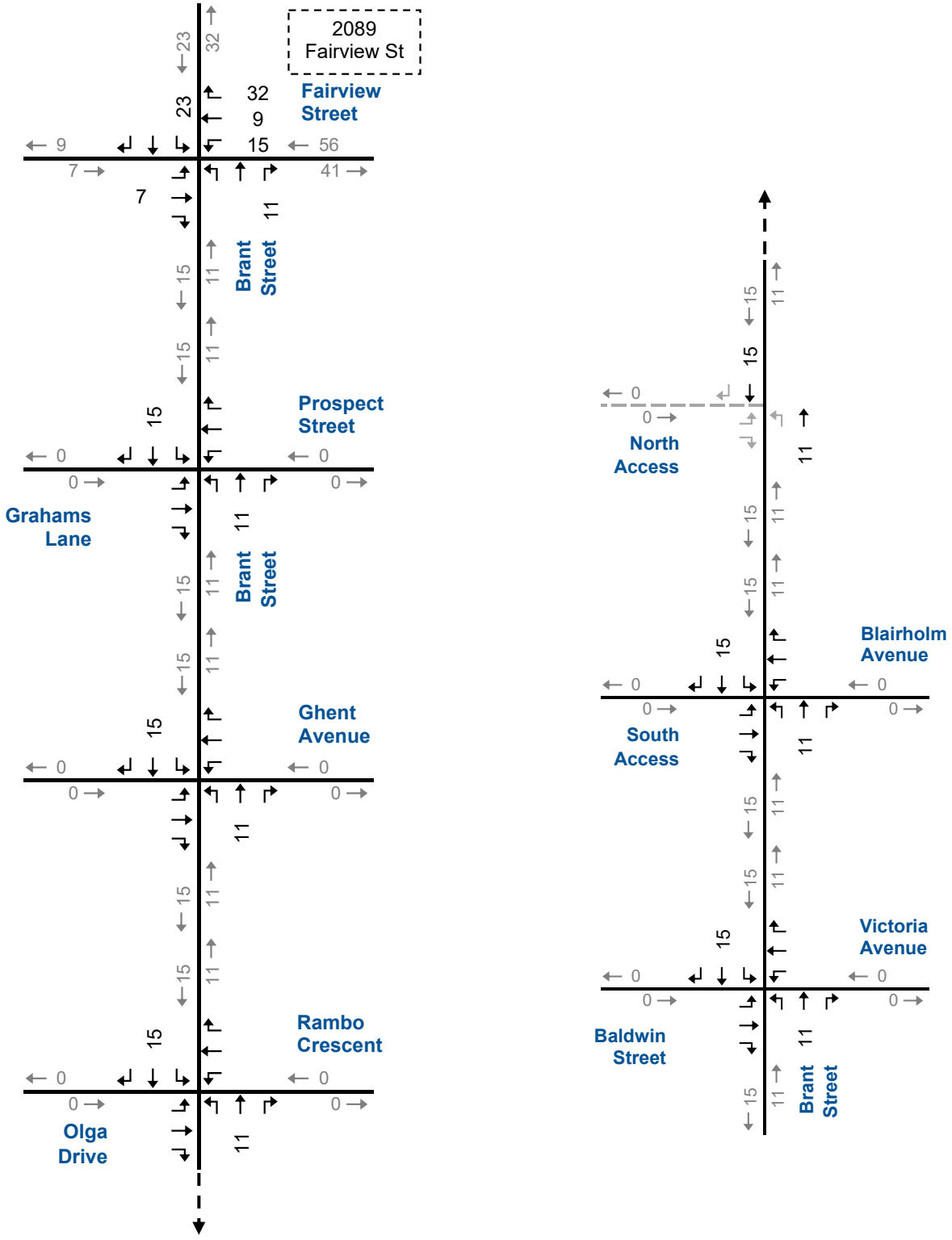
In-Stream Development Traffic Volumes
Brant Street & Ghent Avenue
AM Peak Hour

688 Brant Street, Burlington
210691

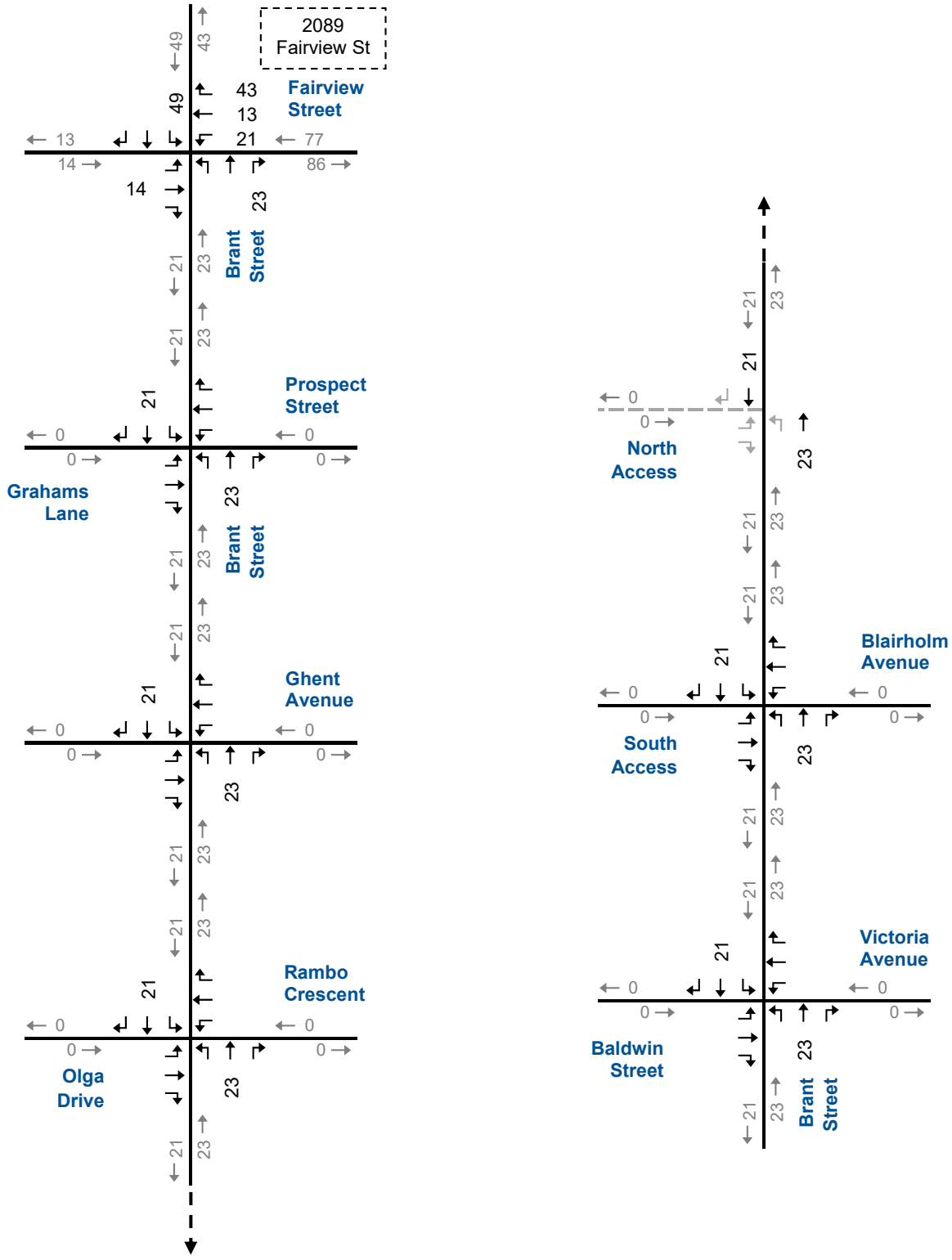
Appendix G



In-Stream Development Traffic Volumes
Brant Street & Ghent Avenue
PM Peak Hour



In-Stream Development Traffic Volumes
2089 Fairview Street
AM Peak Hour



In-Stream Development Traffic Volumes
2089 Fairview Street
PM Peak Hour

688 Brant Street, Burlington
210691

Appendix G

Appendix H

Background Traffic Operations

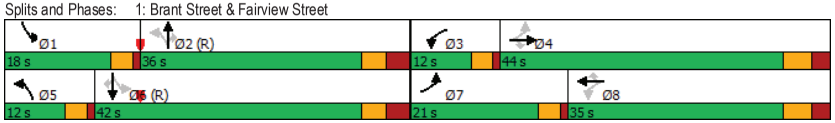


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	544	197	141	264	183	161	554	175	215	623	93
Future Volume (vph)	178	544	197	141	264	183	161	554	175	215	623	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		190.0	75.0		0.0	85.0		80.0	55.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00		0.96	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3406	1538	1687	3343	1509	1719	3539	1553	1671	3539	1392
Flt Permitted	0.432			0.306			0.331			0.323		
Satd. Flow (perm)	801	3406	1509	542	3343	1481	597	3539	1497	564	3539	1364
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214			199			192			153
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		327.7			350.7			292.3			238.7	
Travel Time (s)		23.6			25.3			21.0			17.2	
Confl. Peds. (#/hr)	5		5	5		5	6		18	18		6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	6%	5%	7%	8%	7%	5%	2%	4%	8%	2%	16%
Adj. Flow (vph)	193	591	214	153	287	199	175	602	190	234	677	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	193	591	214	153	287	199	175	602	190	234	677	101
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes				
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	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%
Maximum Green (s)	17.0	37.6	37.6	8.0	28.6	28.6	8.0	29.5	29.5	14.0	35.5	35.5
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?												
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
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	39.3	25.3	25.3	30.0	19.6	19.6	55.4	42.1	42.1	60.7	44.9	44.9
Actuated g/C Ratio	0.36	0.23	0.23	0.27	0.18	0.18	0.50	0.38	0.38	0.55	0.41	0.41
v/c Ratio	0.48	0.75	0.42	0.66	0.48	0.47	0.43	0.44	0.27	0.52	0.47	0.16
Control Delay	28.4	45.5	6.8	40.4	43.3	9.1	16.3	28.4	5.3	17.5	26.5	1.6
Queue Delay	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 Delay	28.4	45.5	6.8	40.4	43.3	9.1	16.3	28.4	5.3	17.5	26.5	1.6
LOS	C	D	A	D	D	A	B	C	A	B	C	A
Approach Delay		33.9			31.9			21.7			22.0	
Approach LOS		C			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 27.0		Intersection LOS: C	
Intersection Capacity Utilization 72.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Brant Street & Fairview Street



Queues
1: Brant Street & Fairview Street

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	193	591	214	153	287	199	175	602	190	234	677	101
v/c Ratio	0.48	0.75	0.42	0.66	0.48	0.47	0.43	0.44	0.27	0.52	0.47	0.16
Control Delay	28.4	45.5	6.8	40.4	43.3	9.1	16.3	28.4	5.3	17.5	26.5	1.6
Queue Delay	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 Delay	28.4	45.5	6.8	40.4	43.3	9.1	16.3	28.4	5.3	17.5	26.5	1.6
Queue Length 50th (m)	30.9	65.7	0.0	24.0	31.0	0.0	18.1	52.2	0.0	25.3	58.0	0.0
Queue Length 95th (m)	45.0	79.7	17.8	36.4	43.3	19.4	34.1	82.5	16.9	45.7	86.9	3.6
Internal Link Dist (m)		303.7			326.7			268.3			214.7	
Turn Bay Length (m)			190.0	75.0			85.0		80.0	55.0		90.0
Base Capacity (vph)	439	1164	656	231	869	532	413	1355	691	472	1445	647
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.51	0.33	0.66	0.33	0.37	0.42	0.44	0.27	0.50	0.47	0.16

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Brant Street & Fairview Street

Future Background
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	544	197	141	264	183	161	554	175	215	623	93
Future Volume (vph)	178	544	197	141	264	183	161	554	175	215	623	93
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	0.98
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)	1767	3406	1509	1686	3343	1481	1718	3539	1497	1667	3539	1364
Flt Permitted	0.43	1.00	1.00	0.31	1.00	1.00	0.33	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	804	3406	1509	544	3343	1481	599	3539	1497	566	3539	1364
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)	193	591	214	153	287	199	175	602	190	234	677	101
RTOR Reduction (vph)	0	0	165	0	0	164	0	0	117	0	0	60
Lane Group Flow (vph)	193	591	49	153	287	35	175	602	73	234	677	41
Confl. Peds. (#/hr)	5		5	5		5	6		18	18		6
Heavy Vehicles (%)	2%	6%	5%	7%	8%	7%	5%	2%	4%	8%	2%	16%
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)	37.3	25.3	25.3	27.6	19.6	19.6	53.0	42.2	42.2	58.6	45.0	45.0
Effective Green, g (s)	37.3	25.3	25.3	27.6	19.6	19.6	53.0	42.2	42.2	58.6	45.0	45.0
Actuated g/C Ratio	0.34	0.23	0.23	0.25	0.18	0.18	0.48	0.38	0.38	0.53	0.41	0.41
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)	392	783	347	219	595	263	398	1357	574	437	1447	558
v/s Ratio Prot	0.06	c0.17		c0.05	0.09		0.04	0.17		c0.07	0.19	
v/s Ratio Perm	0.11		0.03	0.12		0.02	0.17		0.05	c0.22		0.03
v/c Ratio	0.49	0.75	0.14	0.70	0.48	0.13	0.44	0.44	0.13	0.54	0.47	0.07
Uniform Delay, d1	27.2	39.5	33.7	34.3	40.6	38.1	16.7	25.2	22.0	14.7	23.8	19.8
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	1.0	4.2	0.2	9.3	0.6	0.2	0.8	1.1	0.5	1.3	1.1	0.3
Delay (s)	28.1	43.6	33.9	43.6	41.3	38.3	17.5	26.2	22.4	16.0	24.8	20.1
Level of Service	C	D	C	D	D	D	B	C	C	B	C	C
Approach Delay (s)		38.5			40.9			23.9			22.3	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	72.9%	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)	50	7	17	62	5	100	29	817	59	106	1015	91
Future Volume (vph)	50	7	17	62	5	100	29	817	59	106	1015	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		0.99	1.00	
Frt		0.894			0.858			0.990			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1670	0	1770	1585	0	1805	3452	0	1770	3453	0
Flt Permitted	0.681			0.740			0.174			0.255		
Satd. Flow (perm)	1179	1670	0	1363	1585	0	330	3452	0	471	3453	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			112			13			16	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.9			245.1			144.7			292.3	
Travel Time (s)		11.2			17.6			10.4			21.0	
Confl. Peds. (#/hr)	7		11	11		7	18		29	29		18
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	9%	0%	0%	2%	0%	1%	0%	3%	5%	2%	3%	2%
Adj. Flow (vph)	56	8	19	70	6	112	33	918	66	119	1140	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	27	0	70	118	0	33	984	0	119	1242	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		41.0	41.0		10.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	12.0	12.0		12.0	12.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	10.4	10.4		10.4	10.4		55.5	55.5		66.6	55.5	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.62	0.62		0.74	0.62	
v/c Ratio	0.41	0.13		0.45	0.42		0.16	0.46		0.26	0.58	
Control Delay	45.4	19.9		45.5	12.8		7.4	5.8		4.4	12.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.1	
Total Delay	45.4	19.9		45.5	12.8		7.4	5.9		4.4	12.2	
LOS	D	B		D	B		A	A		A	B	
Approach Delay		37.1			25.0			6.0			11.5	
Approach LOS		D			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 43 (48%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Brant Street & Grahams Lane/Prospect Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	27	70	118	33	984	119	1242
v/c Ratio	0.41	0.13	0.45	0.42	0.16	0.46	0.26	0.58
Control Delay	45.4	19.9	45.5	12.8	7.4	5.8	4.4	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Total Delay	45.4	19.9	45.5	12.8	7.4	5.9	4.4	12.2
Queue Length 50th (m)	9.7	1.3	12.2	1.0	0.9	13.4	4.0	62.0
Queue Length 95th (m)	20.5	8.5	24.2	15.5	m4.7	41.5	9.5	96.1
Internal Link Dist (m)		130.9		221.1		120.7		268.3
Turn Bay Length (m)	40.0		20.0		20.0		20.0	
Base Capacity (vph)	209	312	242	373	203	2134	488	2136
Starvation Cap Reductn	0	0	0	0	0	206	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	125
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.09	0.29	0.32	0.16	0.51	0.24	0.62

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	7	17	62	5	100	29	817	59	106	1015	91
Future Volume (vph)	50	7	17	62	5	100	29	817	59	106	1015	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	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	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1645	1671		1749	1584		1799	3452		1766	3452	
Flt Permitted	0.68	1.00		0.74	1.00		0.17	1.00		0.25	1.00	
Satd. Flow (perm)	1180	1671		1362	1584		329	3452		474	3452	
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)	56	8	19	70	6	112	33	918	66	119	1140	102
RTOR Reduction (vph)	0	17	0	0	99	0	0	5	0	0	6	0
Lane Group Flow (vph)	56	10	0	70	19	0	33	979	0	119	1236	0
Confl. Peds. (#/hr)	7		11	11		7	18		29	29		18
Heavy Vehicles (%)	9%	0%	0%	2%	0%	1%	0%	3%	5%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	10.4	10.4		10.4	10.4		55.5	55.5		62.6	55.5	
Effective Green, g (s)	10.4	10.4		10.4	10.4		55.5	55.5		62.6	55.5	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.62	0.62		0.70	0.62	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	136	193		157	183		202	2128		431	2128	
v/s Ratio Prot		0.01			0.01			0.28		c0.02	c0.36	
v/s Ratio Perm	0.05			c0.05			0.10			0.17		
v/c Ratio	0.41	0.05		0.45	0.10		0.16	0.46		0.28	0.58	
Uniform Delay, d1	37.0	35.4		37.1	35.6		7.4	9.2		4.8	10.3	
Progression Factor	1.00	1.00		1.00	1.00		0.62	0.53		1.00	1.00	
Incremental Delay, d2	2.0	0.1		2.0	0.2		1.6	0.7		0.4	1.2	
Delay (s)	39.0	35.5		39.1	35.9		6.1	5.6		5.2	11.5	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		37.9			37.1			5.6			10.9	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	68.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

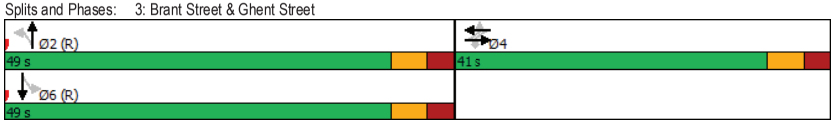
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	238	23	29	15	25	30	18	764	22	21	1142	47
Future Volume (vph)	238	23	29	15	25	30	18	764	22	21	1142	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		25.0	0.0		0.0	45.0		0.0	30.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99	0.98		0.99		1.00	1.00		0.98	1.00	
Frt			0.850		0.942			0.996			0.994	
Flt Protected		0.956			0.990		0.950			0.950		
Satd. Flow (prot)	0	1816	1615	0	1676	0	1805	3486	0	1805	3510	0
Flt Permitted		0.694			0.903		0.167			0.314		
Satd. Flow (perm)	0	1312	1575	0	1526	0	316	3486	0	586	3510	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		31			4			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		177.0			166.8			87.4			144.7	
Travel Time (s)		12.7			12.0			6.3			10.4	
Confl. Peds. (#/hr)	7		15	15		7	21		36	36		21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	9%	0%	7%	0%	3%	0%	0%	2%	2%
Adj. Flow (vph)	245	24	30	15	26	31	19	788	23	22	1177	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	269	30	0	72	0	19	811	0	22	1225	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		23.8	23.8		23.8		52.2	52.2		52.2	52.2	
Actuated g/C Ratio		0.26	0.26		0.26		0.58	0.58		0.58	0.58	
v/c Ratio		0.78	0.07		0.17		0.10	0.40		0.06	0.60	
Control Delay		45.2	3.2		15.1		13.5	13.6		4.4	9.4	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.2	
Total Delay		45.2	3.2		15.1		13.5	13.6		4.4	9.6	
LOS		D	A		B		B	B		A	A	
Approach Delay		41.0			15.1			13.6			9.5	
Approach LOS		D			B			B			A	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 14.9 Intersection LOS: B
Intersection Capacity Utilization 75.5% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Brant Street & Ghent Street



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	269	30	72	19	811	22	1225
v/c Ratio	0.78	0.07	0.17	0.10	0.40	0.06	0.60
Control Delay	45.2	3.2	15.1	13.5	13.6	4.4	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	45.2	3.2	15.1	13.5	13.6	4.4	9.6
Queue Length 50th (m)	45.2	0.0	5.6	1.7	38.7	0.5	82.3
Queue Length 95th (m)	65.0	3.5	14.0	m4.7	52.7	m1.7	126.8
Internal Link Dist (m)	153.0		142.8		63.4		120.7
Turn Bay Length (m)		25.0		45.0		30.0	
Base Capacity (vph)	495	624	595	183	2022	339	2037
Starvation Cap Reductn	0	0	0	0	0	0	200
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.05	0.12	0.10	0.40	0.06	0.67

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	238	23	29	15	25	30	18	764	22	21	1142	47
Future Volume (vph)	238	23	29	15	25	30	18	764	22	21	1142	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		0.98	1.00	
Frt		1.00	0.85		0.94		1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1808	1575		1673		1796	3485		1772	3511	
Flt Permitted		0.69	1.00		0.90		0.17	1.00		0.31	1.00	
Satd. Flow (perm)		1311	1575		1525		316	3485		586	3511	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	245	24	30	15	26	31	19	788	23	22	1177	48
RTOR Reduction (vph)	0	0	22	0	23	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	269	8	0	49	0	19	809	0	22	1222	0
Confl. Peds. (#/hr)	7		15	15		7	21		36	36		21
Heavy Vehicles (%)	0%	0%	0%	9%	0%	7%	0%	3%	0%	0%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Actuated Green, G (s)		23.8	23.8		23.8		52.2	52.2		52.2	52.2	
Effective Green, g (s)		23.8	23.8		23.8		52.2	52.2		52.2	52.2	
Actuated g/C Ratio		0.26	0.26		0.26		0.58	0.58		0.58	0.58	
Clearance Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		346	416		403		183	2021		339	2036	
v/s Ratio Prot								0.23			c0.35	
v/s Ratio Perm		c0.21	0.01		0.03		0.06			0.04		
v/c Ratio		0.78	0.02		0.12		0.10	0.40		0.06	0.60	
Uniform Delay, d1		30.6	24.5		25.2		8.4	10.3		8.2	12.2	
Progression Factor		1.00	1.00		1.00		1.03	1.13		0.37	0.61	
Incremental Delay, d2		10.5	0.0		0.1		1.1	0.6		0.3	1.1	
Delay (s)		41.1	24.5		25.3		9.8	12.2		3.3	8.5	
Level of Service		D	C		C		A	B		A	A	
Approach Delay (s)		39.5			25.3			12.2			8.4	
Approach LOS		D			C			B			A	

Intersection Summary					
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.66				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		14.0	
Intersection Capacity Utilization	75.5%	ICU Level of Service		D	
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)	30	3	53	3	0	9	23	760	2	17	1158	12
Future Volume (vph)	30	3	53	3	0	9	23	760	2	17	1158	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.917			0.896						0.998	
Flt Protected		0.983			0.989		0.950			0.950		
Satd. Flow (prot)	0	1652	0	0	1684	0	1641	3471	0	1687	1807	0
Flt Permitted		0.983			0.989		0.950			0.950		
Satd. Flow (perm)	0	1652	0	0	1684	0	1641	3471	0	1687	1807	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		104.9			57.0			58.9			95.8	
Travel Time (s)		7.6			4.1			4.2			6.9	
Confl. Peds. (#/hr)							64		56	56		64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	10%	4%	0%	7%	5%	0%
Adj. Flow (vph)	33	3	58	3	0	10	25	826	2	18	1259	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	13	0	25	828	0	18	1272	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary					
Area Type:	Other				
Control Type: Unsignalized					
Intersection Capacity Utilization	76.2%		ICU Level of Service D		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	3	53	3	0	9	23	760	2	17	1158	12
Future Volume (Veh/h)	30	3	53	3	0	9	23	760	2	17	1158	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	3	58	3	0	10	25	826	2	18	1259	13
Pedestrians		64			56							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		5			5							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								136			183	
pX, platoon unblocked	0.46	0.46	0.43	0.46	0.46	0.95	0.43			0.95		
vC, conflicting volume	1838	2300	1330	2288	2305	470	1336			884		
vC1, stage 1 conf vol	1366	1366		933	933							
vC2, stage 2 conf vol	473	934		1354	1372							
vCu, unblocked vol	1815	2828	1103	2802	2840	331	1118			768		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.3			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	58	97	29	0	100	98	89			98		
cM capacity (veh/h)	78	95	81	1	73	606	234			732		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	94	13	25	551	277	18	1272
Volume Left	33	3	25	0	0	18	0
Volume Right	58	10	0	0	2	0	13
cSH	80	4	234	1700	1700	732	1700
Volume to Capacity	1.17	3.41	0.11	0.32	0.16	0.02	0.75
Queue Length 95th (m)	54.8	Err	2.8	0.0	0.0	0.6	0.0
Control Delay (s)	246.4	Err	22.2	0.0	0.0	10.0	0.0
Lane LOS	F	F	C			B	
Approach Delay (s)	246.4	Err	0.7			0.1	
Approach LOS	F	F					

Intersection Summary					
Average Delay		68.4			
Intersection Capacity Utilization		76.2%	ICU Level of Service		D
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	1	39	0	137	0	646	23	51	735	0
Future Volume (vph)	2	1	1	39	0	137	0	646	23	51	735	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	0		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.99	0.84	0.86		0.97		1.00		0.97		
Frt			0.850			0.850		0.995				
Flt Protected		0.968		0.950						0.950		
Satd. Flow (prot)	0	1104	1615	1626	0	1509	0	3171	0	1656	1743	0
Flt Permitted		0.968		0.756						0.354		
Satd. Flow (perm)	0	1089	1358	1111	0	1461	0	3171	0	601	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48			135		6				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.3			100.7			228.8			77.4	
Travel Time (s)		4.3			7.3			16.5			5.6	
Confl. Peds. (#/hr)	15		63	63		15	119		60	60		119
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	100%	0%	0%	11%	0%	7%	0%	13%	10%	9%	9%	0%
Adj. Flow (vph)	2	1	1	46	0	161	0	760	27	60	865	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	1	46	0	161	0	787	0	60	865	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1		1		2		1	2	
Detector Template	Left	Thru	Right	Left		Right		Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0		2.0		10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0		2.0		0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	4	8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0		8.0		8.0		8.0	8.0	
Minimum Split (s)	26.0	26.0	26.0	26.0		26.0		40.5		40.5	40.5	
Total Split (s)	33.0	33.0	33.0	33.0		33.0		57.0		57.0	57.0	
Total Split (%)	36.7%	36.7%	36.7%	36.7%		36.7%		63.3%		63.3%	63.3%	
Maximum Green (s)	27.0	27.0	27.0	27.0		27.0		50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0		4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0		3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Recall Mode	None	None	None	None		None		C-Max		C-Max	C-Max	
Walk Time (s)	10.0	10.0	10.0	10.0		10.0		25.0		25.0	25.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0		10.0		8.0		8.0	8.0	
Pedestrian Calls (#/hr)	0	0	0	0		0		0		0	0	
Act Effct Green (s)		10.0	10.0	10.0		10.0		67.0		67.0	67.0	
Actuated g/C Ratio		0.11	0.11	0.11		0.11		0.74		0.74	0.74	
v/c Ratio		0.02	0.01	0.37		0.57		0.33		0.13	0.67	
Control Delay		34.0	0.0	45.0		18.1		4.7		6.4	13.6	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		34.0	0.0	45.0		18.1		4.7		6.4	13.6	
LOS		C	A	D		B		A		A	B	
Approach Delay		25.5			24.1			4.7			13.1	
Approach LOS		C			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 55 (61%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 10.9		Intersection LOS: B	
Intersection Capacity Utilization 75.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 5: Brant Street & South Driveway/Blairholm Avenue



Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	3	1	46	161	787	60	865
v/c Ratio	0.02	0.01	0.37	0.57	0.33	0.13	0.67
Control Delay	34.0	0.0	45.0	18.1	4.7	6.4	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	0.0	45.0	18.1	4.7	6.4	13.6
Queue Length 50th (m)	0.5	0.0	8.0	4.4	16.2	2.2	47.6
Queue Length 95th (m)	2.9	0.0	16.9	19.2	39.3	m8.8	111.0
Internal Link Dist (m)	35.3				204.8		53.4
Turn Bay Length (m)			15.0			15.0	
Base Capacity (vph)	326	441	333	532	2361	447	1297
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.00	0.14	0.30	0.33	0.13	0.67

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	1	39	0	137	0	646	23	51	735	0
Future Volume (vph)	2	1	1	39	0	137	0	646	23	51	735	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00	1.00		1.00		0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.84	1.00		0.97		1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00	0.86		1.00		1.00		0.97	1.00	
Frt		1.00	0.85	1.00		0.85		0.99		1.00	1.00	
Flt Protected		0.97	1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1088	1358	1397		1461		3170		1611	1743	
Flt Permitted		0.97	1.00	0.76		1.00		1.00		0.35	1.00	
Satd. Flow (perm)		1088	1358	1111		1461		3170		600	1743	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	2	1	1	46	0	161	0	760	27	60	865	0
RTOR Reduction (vph)	0	0	1	0	0	120	0	2	0	0	0	0
Lane Group Flow (vph)	0	3	0	46	0	41	0	785	0	60	865	0
Confl. Peds. (#/hr)	15		63	63		15	119		60	60		119
Heavy Vehicles (%)	100%	0%	0%	11%	0%	7%	0%	13%	10%	9%	9%	0%
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Actuated Green, G (s)		10.0	10.0	10.0		10.0		67.0		67.0	67.0	
Effective Green, g (s)		10.0	10.0	10.0		10.0		67.0		67.0	67.0	
Actuated g/C Ratio		0.11	0.11	0.11		0.11		0.74		0.74	0.74	
Clearance Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		120	150	123		162		2359		446	1297	
v/s Ratio Prot								0.25			c0.50	
v/s Ratio Perm		0.00	0.00	c0.04		0.03				0.10		
v/c Ratio		0.03	0.00	0.37		0.25		0.33		0.13	0.67	
Uniform Delay, d1		35.7	35.6	37.1		36.6		3.9		3.3	5.8	
Progression Factor		1.00	1.00	1.00		1.00		1.05		1.47	1.63	
Incremental Delay, d2		0.1	0.0	1.9		0.8		0.3		0.6	2.4	
Delay (s)		35.7	35.6	39.0		37.4		4.4		5.4	12.0	
Level of Service		D	D	D		D		A		A	B	
Approach Delay (s)		35.7			37.8			4.4			11.5	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	75.6%	ICU Level of Service	D	
Analysis Period (min)	15			

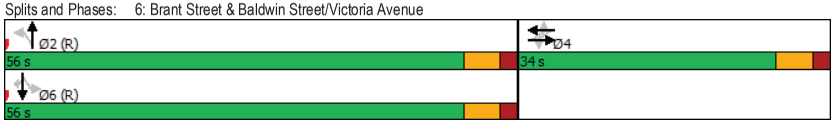
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	14	26	14	44	60	12	614	15	42	530	166
Future Volume (vph)	75	14	26	14	44	60	12	614	15	42	530	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	40.0		0.0	15.0		0.0	45.0		50.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. 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
Ped Bike Factor	0.82	0.90		0.87	0.88		0.97	1.00		0.96		0.91
Frt		0.902			0.914			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1546	0	1671	1441	0	1805	1849	0	1752	1810	1583
Flt Permitted	0.685			0.729			0.417			0.357		
Satd. Flow (perm)	1070	1546	0	1122	1441	0	771	1849	0	632	1810	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			64			2				177
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		105.7			113.2			98.7			228.8	
Travel Time (s)		9.5			10.2			7.1			16.5	
Confl. Peds. (#/hr)	192		74	74		192	54		105	105		54
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	8%	5%	6%	0%	2%	0%	3%	5%	2%
Adj. Flow (vph)	80	15	28	15	47	64	13	653	16	45	564	177
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	43	0	15	111	0	13	669	0	45	564	177
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Detector Phase	4	4		4	4		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	32.0	32.0		32.0	32.0		42.0	42.0		42.0	42.0	42.0
Total Split (s)	34.0	34.0		34.0	34.0		56.0	56.0		56.0	56.0	56.0
Total Split (%)	37.8%	37.8%		37.8%	37.8%		62.2%	62.2%		62.2%	62.2%	62.2%
Maximum Green (s)	28.0	28.0		28.0	28.0		50.0	50.0		50.0	50.0	50.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	25.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	12.5	12.5		12.5	12.5		65.5	65.5		65.5	65.5	65.5
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.73	0.73		0.73	0.73	0.73
v/c Ratio	0.54	0.18		0.10	0.44		0.02	0.50		0.10	0.43	0.16
Control Delay	48.5	18.3		32.7	21.6		4.7	7.4		2.8	4.5	1.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.5	18.3		32.7	21.6		4.7	7.4		2.8	4.5	1.1
LOS	D	B		C	C		A	A		A	A	A
Approach Delay		37.9			22.9			7.4			3.7	
Approach LOS		D			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 82 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 9.0		Intersection LOS: A	
Intersection Capacity Utilization 70.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Brant Street & Baldwin Street/Victoria Avenue



Queues
6: Brant Street & Baldwin Street/Victoria Avenue

Future Background
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	80	43	15	111	13	669	45	564	177
v/c Ratio	0.54	0.18	0.10	0.44	0.02	0.50	0.10	0.43	0.16
Control Delay	48.5	18.3	32.7	21.6	4.7	7.4	2.8	4.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	18.3	32.7	21.6	4.7	7.4	2.8	4.5	1.1
Queue Length 50th (m)	13.8	2.4	2.4	7.8	0.6	42.2	1.5	32.2	2.7
Queue Length 95th (m)	26.7	11.1	7.7	21.9	2.6	83.4	m2.6	57.9	m4.5
Internal Link Dist (m)		81.7		89.2		74.7		204.8	
Turn Bay Length (m)	15.0		40.0		15.0		45.0		50.0
Base Capacity (vph)	332	500	349	492	561	1346	459	1317	1096
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.09	0.04	0.23	0.02	0.50	0.10	0.43	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
6: Brant Street & Baldwin Street/Victoria Avenue

Future Background
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	14	26	14	44	60	12	614	15	42	530	166
Future Volume (vph)	75	14	26	14	44	60	12	614	15	42	530	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.90		1.00	0.88		1.00	1.00		1.00	1.00	0.91
Flpb, ped/bikes	0.82	1.00		0.87	1.00		0.97	1.00		0.95	1.00	1.00
Frt	1.00	0.90		1.00	0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1484	1546		1462	1440		1751	1850		1668	1810	1441
Flt Permitted	0.69	1.00		0.73	1.00		0.42	1.00		0.36	1.00	1.00
Satd. Flow (perm)	1071	1546		1122	1440		768	1850		628	1810	1441
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	80	15	28	15	47	64	13	653	16	45	564	177
RTOR Reduction (vph)	0	24	0	0	55	0	0	1	0	0	0	48
Lane Group Flow (vph)	80	19	0	15	56	0	13	668	0	45	564	129
Confl. Peds. (#/hr)	192		74	74		192	54		105	105		54
Heavy Vehicles (%)	0%	0%	0%	8%	5%	6%	0%	2%	0%	3%	5%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)	12.5	12.5		12.5	12.5		65.5	65.5		65.5	65.5	65.5
Effective Green, g (s)	12.5	12.5		12.5	12.5		65.5	65.5		65.5	65.5	65.5
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.73	0.73		0.73	0.73	0.73
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	148	214		155	200		558	1346		457	1317	1048
v/s Ratio Prot		0.01			0.04			c0.36			0.31	
v/s Ratio Perm	c0.07			0.01			0.02			0.07		0.09
v/c Ratio	0.54	0.09		0.10	0.28		0.02	0.50		0.10	0.43	0.12
Uniform Delay, d1	36.1	33.8		33.8	34.7		3.4	5.2		3.6	4.8	3.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.53	0.66	1.02
Incremental Delay, d2	4.0	0.2		0.3	0.8		0.1	1.3		0.3	0.8	0.2
Delay (s)	40.1	34.0		34.1	35.5		3.5	6.5		2.2	4.0	3.9
Level of Service	D	C		C	D		A	A		A	A	A
Approach Delay (s)		37.9			35.3			6.5			3.9	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	70.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	785	786	0
Future Volume (vph)	0	0	0	785	786	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	15.0			0.0
Storage Lanes	0	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	1863	3539	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	1863	3539	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.1			77.4	58.9	
Travel Time (s)	3.6			5.6	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	853	854	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	853	854	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	785	786	0
Future Volume (Veh/h)	0	0	0	785	786	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	853	854	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				77	242	
pX, platoon unblocked	0.75	0.72	0.72			
vC, conflicting volume	1280	854	854			
vC1, stage 1 conf vol	854					
vC2, stage 2 conf vol	426					
vCu, unblocked vol	868	600	600			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	349	319	699			

Direction, Lane #	NB 1	NB 2	NB 3	SB 1
Volume Total	0	426	426	854
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.25	0.25	0.50
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			0.0
Approach LOS				

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		44.7%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection: 1: Brant Street & Fairview Street

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	66.8	81.4	79.2	25.7	73.0	75.9	60.4	14.5	49.2	74.2	77.5	65.3
Average Queue (m)	30.5	54.9	45.8	1.4	34.7	32.0	22.8	0.7	25.0	38.0	41.7	6.2
95th Queue (m)	53.9	76.3	71.4	13.2	64.5	62.2	48.6	7.2	45.4	61.8	65.7	29.7
Link Distance (m)	313.0	313.0	313.0			336.1	336.1	336.1		266.9	266.9	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)				190.0	75.0				85.0			80.0
Storage Blk Time (%)					3					0	0	0
Queuing Penalty (veh)					3					0	1	0

Intersection: 1: Brant Street & Fairview Street

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	62.3	151.2	142.4	46.7
Average Queue (m)	40.4	67.9	49.5	4.4
95th Queue (m)	70.9	128.3	113.6	35.9
Link Distance (m)		224.1	224.1	
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	55.0			90.0
Storage Blk Time (%)	1	14	3	0
Queuing Penalty (veh)	4	29	3	0

Intersection: 2: Brant Street & Grahams Lane/Prospect Street

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	32.4	17.6	24.7	34.2	20.1	51.9	55.8	27.4	272.9	279.9
Average Queue (m)	12.4	6.0	11.5	10.0	5.0	21.3	27.7	22.4	232.9	228.2
95th Queue (m)	27.3	15.2	23.7	22.4	14.3	42.8	51.4	38.0	288.4	293.9
Link Distance (m)		140.7		228.0		121.8	121.8		266.9	266.9
Upstream Blk Time (%)									3	5
Queuing Penalty (veh)									16	23
Storage Bay Dist (m)	40.0		20.0		20.0			20.0		
Storage Blk Time (%)	0		7	1	0	9		3	79	
Queuing Penalty (veh)	0		8	1	1	3		13	83	

Intersection: 3: Brant Street & Ghent Street

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	74.6	32.5	32.8	21.6	41.8	43.5	37.3	139.5	139.8
Average Queue (m)	42.6	9.7	11.7	5.9	22.5	24.6	5.9	129.4	127.0
95th Queue (m)	65.6	29.2	25.5	17.2	37.0	39.1	24.1	136.0	141.3
Link Distance (m)	163.0		152.7		67.2	67.2		121.8	121.8
Upstream Blk Time (%)								35	19
Queuing Penalty (veh)								193	102
Storage Bay Dist (m)		25.0		45.0			30.0		
Storage Blk Time (%)	27	0			0			45	
Queuing Penalty (veh)	8	0			0			9	

Intersection: 4: Brant Street & Olga Drive/Rambo Crescent

Movement	EB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	TR
Maximum Queue (m)	43.5	12.3	16.5	2.4	3.3	11.0	16.8
Average Queue (m)	16.9	3.2	4.6	0.1	0.1	1.5	0.9
95th Queue (m)	33.5	10.6	13.6	1.3	2.3	6.8	8.8
Link Distance (m)	93.5	41.8		40.4	40.4		77.0
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			20.0			15.0	
Storage Blk Time (%)			1			0	0
Queuing Penalty (veh)			2			2	0

Intersection: 5: Brant Street & South Driveway/Blairholm Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	R	T	TR	L	T
Maximum Queue (m)	11.3	4.8	22.0	44.8	72.2	69.3	22.2	68.8
Average Queue (m)	0.7	0.2	9.3	15.4	30.6	28.0	7.8	52.7
95th Queue (m)	5.6	2.4	19.7	29.9	58.0	54.6	21.2	78.4
Link Distance (m)	47.9	47.9		87.0	203.2	203.2		62.4
Upstream Blk Time (%)								5
Queuing Penalty (veh)								36
Storage Bay Dist (m)			15.0				15.0	
Storage Blk Time (%)			8	6			2	24
Queuing Penalty (veh)			11	2			12	12

Intersection: 6: Brant Street & Baldwin Street/Victoria Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (m)	21.0	30.6	18.8	31.8	17.3	92.8	45.8	70.9	57.1
Average Queue (m)	12.8	5.7	3.6	15.2	2.5	54.9	9.0	33.8	15.0
95th Queue (m)	22.7	18.2	11.9	28.3	10.4	93.0	24.3	58.8	39.2
Link Distance (m)		91.1		99.4		88.1		203.2	
Upstream Blk Time (%)						2			
Queuing Penalty (veh)						0			
Storage Bay Dist (m)	15.0		40.0		15.0		45.0		50.0
Storage Blk Time (%)	17	1		0	0	27		2	0
Queuing Penalty (veh)	7	1		0	2	3		4	0

Intersection: 7: Brant Street & North Driveway

Movement	SB
Directions Served	TR
Maximum Queue (m)	41.9
Average Queue (m)	8.7
95th Queue (m)	29.0
Link Distance (m)	40.4
Upstream Blk Time (%)	0
Queuing Penalty (veh)	4
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

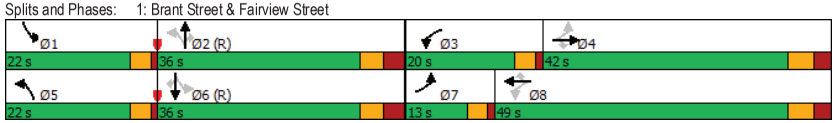
Network wide Queuing Penalty: 599

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	639	229	270	1160	357	303	774	209	248	671	194
Future Volume (vph)	240	639	229	270	1160	357	303	774	209	248	671	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		190.0	75.0		0.0	85.0		80.0	55.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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
Ped Bike Factor			0.98	1.00		0.96	0.99		0.92	0.99		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3471	1583	1752	3539	1553	1787	3574	1568	1752	3574	1568
Flt Permitted	0.110			0.227			0.172			0.133		
Satd. Flow (perm)	209	3471	1550	418	3539	1495	321	3574	1450	242	3574	1510
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			299			215			192
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		327.7			350.7			292.3			238.7	
Travel Time (s)		23.6			25.3			21.0			17.2	
Confl. Peds. (#/hr)	17		6	6		17	17		43	43		17
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	2%	3%	2%	4%	1%	1%	3%	3%	1%	3%
Adj. Flow (vph)	247	659	236	278	1196	368	312	798	215	256	692	200
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	659	236	278	1196	368	312	798	215	256	692	200
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes				
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	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%
Maximum Green (s)	9.0	35.6	35.6	16.0	42.6	42.6	18.0	29.5	29.5	18.0	29.5	29.5
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?												
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
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	47.8	36.4	36.4	57.7	42.5	42.5	51.3	31.3	31.3	49.0	30.1	30.1
Actuated g/C Ratio	0.40	0.30	0.30	0.48	0.35	0.35	0.43	0.26	0.26	0.41	0.25	0.25
v/c Ratio	1.22	0.63	0.37	0.76	0.96	0.51	0.89	0.86	0.40	0.84	0.77	0.38
Control Delay	163.1	39.3	5.8	33.4	54.9	9.0	54.7	53.1	7.2	52.5	48.7	8.1
Queue Delay	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 Delay	163.1	39.3	5.8	33.4	54.9	9.0	54.7	53.1	7.2	52.5	48.7	8.1
LOS	F	D	A	C	D	A	D	D	A	D	D	A
Approach Delay		59.2			42.5			46.0			42.5	
Approach LOS		E			D			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 46.8		Intersection LOS: D	
Intersection Capacity Utilization 99.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	659	236	278	1196	368	312	798	215	256	692	200
v/c Ratio	1.22	0.63	0.37	0.76	0.96	0.51	0.89	0.86	0.40	0.84	0.77	0.38
Control Delay	163.1	39.3	5.8	33.4	54.9	9.0	54.7	53.1	7.2	52.5	48.7	8.1
Queue Delay	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 Delay	163.1	39.3	5.8	33.4	54.9	9.0	54.7	53.1	7.2	52.5	48.7	8.1
Queue Length 50th (m)	~58.2	74.5	0.0	41.1	150.8	11.5	52.8	101.5	0.0	43.8	84.8	1.5
Queue Length 95th (m)	#112.2	95.5	18.8	#63.1	#197.8	38.4	#105.3	#138.1	19.6	#84.3	107.8	20.6
Internal Link Dist (m)		303.7			326.7			268.3			214.7	
Turn Bay Length (m)			190.0	75.0			85.0		80.0	55.0		90.0
Base Capacity (vph)	202	1052	634	379	1256	723	357	931	536	328	896	523
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.63	0.37	0.73	0.95	0.51	0.87	0.86	0.40	0.78	0.77	0.38

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	639	229	270	1160	357	303	774	209	248	671	194
Future Volume (vph)	240	639	229	270	1160	357	303	774	209	248	671	194
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	0.96	1.00	1.00	0.92	1.00	1.00	0.96
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)	1805	3471	1550	1752	3539	1495	1786	3574	1450	1750	3574	1510
Flt Permitted	0.11	1.00	1.00	0.23	1.00	1.00	0.17	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	209	3471	1550	418	3539	1495	323	3574	1450	245	3574	1510
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	247	659	236	278	1196	368	312	798	215	256	692	200
RTOR Reduction (vph)	0	0	164	0	0	193	0	0	159	0	0	144
Lane Group Flow (vph)	247	659	72	278	1196	175	312	798	56	256	692	56
Confl. Peds. (#/hr)	17		6	6		17	17		43	43		17
Heavy Vehicles (%)	0%	4%	2%	3%	2%	4%	1%	1%	3%	3%	1%	3%
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)	45.4	36.4	36.4	55.5	42.5	42.5	48.7	31.2	31.2	46.5	30.1	30.1
Effective Green, g (s)	45.4	36.4	36.4	55.5	42.5	42.5	48.7	31.2	31.2	46.5	30.1	30.1
Actuated g/C Ratio	0.38	0.30	0.30	0.46	0.35	0.35	0.41	0.26	0.26	0.39	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)	198	1052	470	361	1253	529	344	929	377	300	896	378
v/s Ratio Prot	c0.09	0.19		c0.10	0.34		c0.13	0.22		0.12	0.19	
v/s Ratio Perm	c0.38		0.05	0.26		0.12	c0.24		0.04	0.21		0.04
v/c Ratio	1.25	0.63	0.15	0.77	0.95	0.33	0.91	0.86	0.15	0.85	0.77	0.15
Uniform Delay, d1	30.9	36.0	30.5	22.7	37.8	28.3	27.9	42.3	34.2	29.8	41.8	35.0
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	146.3	1.2	0.2	9.7	15.7	0.4	26.3	10.2	0.8	20.3	6.4	0.8
Delay (s)	177.1	37.1	30.7	32.4	53.5	28.7	54.2	52.5	35.0	50.1	48.2	35.8
Level of Service	F	D	C	C	D	C	D	D	D	D	D	D
Approach Delay (s)		66.1			45.4			50.0			46.5	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	99.6%	ICU Level of Service	F	
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)	140	12	47	100	10	148	12	998	56	199	1007	49
Future Volume (vph)	140	12	47	100	10	148	12	998	56	199	1007	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		0.99	1.00	
Frt		0.881			0.860			0.992			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1644	0	1805	1588	0	1805	3499	0	1787	3538	0
Flt Permitted	0.616			0.716			0.191			0.191		
Satd. Flow (perm)	1151	1644	0	1347	1588	0	362	3499	0	357	3538	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50			157			10			8	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.9			245.1			144.7			292.3	
Travel Time (s)		11.2			17.6			10.4			21.0	
Confl. Peds. (#/hr)	8		10	10		8	9		25	25		9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	0%	2%	3%	1%	1%	5%
Adj. Flow (vph)	149	13	50	106	11	157	13	1062	60	212	1071	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	63	0	106	168	0	13	1122	0	212	1123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		41.0	41.0		10.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	12.0	12.0		12.0	12.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	14.5	14.5		14.5	14.5		50.3	50.3		62.5	50.3	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.56	0.56		0.69	0.56	
v/c Ratio	0.81	0.21		0.49	0.43		0.06	0.57		0.56	0.57	
Control Delay	68.1	14.4		42.1	10.5		5.8	8.0		10.3	14.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.1	
Total Delay	68.1	14.4		42.1	10.5		5.8	8.0		10.3	14.7	
LOS	E	B		D	B		A	A		B	B	
Approach Delay		52.1			22.7			8.0			14.0	
Approach LOS		D			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 85 (94%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 82.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Brant Street & Grahams Lane/Prospect Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	149	63	106	168	13	1122	212	1123
v/c Ratio	0.81	0.21	0.49	0.43	0.06	0.57	0.56	0.57
Control Delay	68.1	14.4	42.1	10.5	5.8	8.0	10.3	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Total Delay	68.1	14.4	42.1	10.5	5.8	8.0	10.3	14.7
Queue Length 50th (m)	25.9	2.0	17.4	1.7	0.7	31.2	10.7	68.5
Queue Length 95th (m)	#55.7	12.9	33.9	18.9	m1.4	35.3	17.8	88.4
Internal Link Dist (m)		130.9		221.1		120.7		268.3
Turn Bay Length (m)	40.0		20.0		20.0		20.0	
Base Capacity (vph)	204	333	239	411	202	1958	393	1979
Starvation Cap Reductn	0	0	0	0	0	82	0	0
Spillback Cap Reductn	0	1	0	0	0	0	0	78
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.19	0.44	0.41	0.06	0.60	0.54	0.59

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	12	47	100	10	148	12	998	56	199	1007	49
Future Volume (vph)	140	12	47	100	10	148	12	998	56	199	1007	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.86		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1775	1644		1787	1588		1801	3499		1786	3538	
Flt Permitted	0.62	1.00		0.72	1.00		0.19	1.00		0.19	1.00	
Satd. Flow (perm)	1151	1644		1347	1588		361	3499		359	3538	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	149	13	50	106	11	157	13	1062	60	212	1071	52
RTOR Reduction (vph)	0	42	0	0	132	0	0	4	0	0	4	0
Lane Group Flow (vph)	149	21	0	106	36	0	13	1118	0	212	1119	0
Confl. Peds. (#/hr)	8		10	10		8	9		25	25		9
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	0%	2%	3%	1%	1%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	14.5	14.5		14.5	14.5		50.2	50.2		58.5	50.2	
Effective Green, g (s)	14.5	14.5		14.5	14.5		50.2	50.2		58.5	50.2	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.56	0.56		0.65	0.56	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	264		217	255		201	1951		364	1973	
v/s Ratio Prot		0.01			0.02			0.32		c0.05	0.32	
v/s Ratio Perm	c0.13			0.08			0.04			c0.32		
v/c Ratio	0.81	0.08		0.49	0.14		0.06	0.57		0.58	0.57	
Uniform Delay, d1	36.4	32.1		34.4	32.4		9.1	12.9		7.8	12.9	
Progression Factor	1.00	1.00		1.00	1.00		0.49	0.51		1.00	1.00	
Incremental Delay, d2	21.9	0.1		1.7	0.3		0.6	1.1		2.4	1.2	
Delay (s)	58.3	32.2		36.1	32.7		5.0	7.7		10.2	14.1	
Level of Service	E	C		D	C		A	A		B	B	
Approach Delay (s)		50.5			34.0			7.6			13.4	
Approach LOS		D			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	D	
Analysis Period (min)	15			

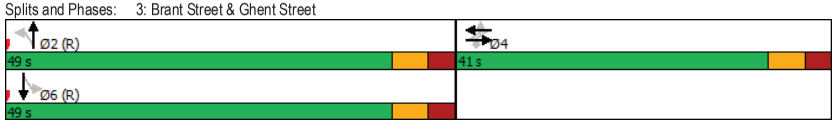
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	23	36	22	50	42	33	836	16	47	1112	205
Future Volume (vph)	227	23	36	22	50	42	33	836	16	47	1112	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		25.0	0.0		0.0	45.0		0.0	30.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		0.99			1.00		0.99	0.99	
Frt			0.850		0.951			0.997			0.977	
Flt Protected		0.957			0.990		0.950			0.950		
Satd. Flow (prot)	0	1818	1615	0	1778	0	1805	3560	0	1687	3468	0
Flt Permitted		0.700			0.896		0.114			0.268		
Satd. Flow (perm)	0	1326	1579	0	1607	0	217	3560	0	471	3468	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		37			3			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		177.0			166.8			87.4			144.7	
Travel Time (s)		12.7			12.0			6.3			10.4	
Confl. Peds. (#/hr)	5		12	12		5	20		29	29		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	7%	1%	0%
Adj. Flow (vph)	244	25	39	24	54	45	35	899	17	51	1196	220
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	269	39	0	123	0	35	916	0	51	1416	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		24.6	24.6		24.6		51.4	51.4		51.4	51.4	
Actuated g/C Ratio		0.27	0.27		0.27		0.57	0.57		0.57	0.57	
v/c Ratio		0.75	0.08		0.26		0.28	0.45		0.19	0.71	
Control Delay		41.8	5.2		17.3		17.5	10.3		9.6	11.1	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		41.8	5.2		17.3		17.5	10.3		9.6	11.1	
LOS		D	A		B		B	B		A	B	
Approach Delay		37.2			17.3			10.6			11.0	
Approach LOS		D			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 77.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Brant Street & Ghent Street



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	269	39	123	35	916	51	1416
v/c Ratio	0.75	0.08	0.26	0.28	0.45	0.19	0.71
Control Delay	41.8	5.2	17.3	17.5	10.3	9.6	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	5.2	17.3	17.5	10.3	9.6	11.1
Queue Length 50th (m)	44.5	0.0	12.0	1.2	17.2	2.6	40.5
Queue Length 95th (m)	63.1	5.3	22.2	10.3	92.6	m5.7	51.5
Internal Link Dist (m)	153.0		142.8		63.4		120.7
Turn Bay Length (m)		25.0		45.0		30.0	
Base Capacity (vph)	500	626	630	123	2035	269	1995
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.06	0.20	0.28	0.45	0.19	0.71

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	23	36	22	50	42	33	836	16	47	1112	205
Future Volume (vph)	227	23	36	22	50	42	33	836	16	47	1112	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		0.99	1.00	
Frt		1.00	0.85		0.95		1.00	1.00		1.00	0.98	
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1812	1579		1776		1800	3560		1666	3467	
Flt Permitted		0.70	1.00		0.90		0.11	1.00		0.27	1.00	
Satd. Flow (perm)		1327	1579		1607		217	3560		471	3467	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	244	25	39	24	54	45	35	899	17	51	1196	220
RTOR Reduction (vph)	0	0	28	0	27	0	0	1	0	0	13	0
Lane Group Flow (vph)	0	269	11	0	96	0	35	915	0	51	1403	0
Confl. Peds. (#/hr)	5		12	12		5	20		29	29		20
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	7%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Actuated Green, G (s)		24.6	24.6		24.6		51.4	51.4		51.4	51.4	
Effective Green, g (s)		24.6	24.6		24.6		51.4	51.4		51.4	51.4	
Actuated g/C Ratio		0.27	0.27		0.27		0.57	0.57		0.57	0.57	
Clearance Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		362	431		439		123	2033		268	1980	
v/s Ratio Prot								0.26			c0.40	
v/s Ratio Perm		c0.20	0.01		0.06		0.16			0.11		
v/c Ratio		0.74	0.02		0.22		0.28	0.45		0.19	0.71	
Uniform Delay, d1		29.8	23.9		25.3		9.9	11.1		9.3	13.9	
Progression Factor		1.00	1.00		1.00		0.78	0.77		0.64	0.57	
Incremental Delay, d2		8.0	0.0		0.3		5.6	0.7		1.4	2.0	
Delay (s)		37.8	23.9		25.5		13.3	9.3		7.4	9.9	
Level of Service		D	C		C		B	A		A	A	
Approach Delay (s)		36.1			25.5			9.4			9.8	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
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)	20	2	23	0	0	8	36	903	1	30	1086	54
Future Volume (vph)	20	2	23	0	0	8	36	903	1	30	1086	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.931			0.865						0.993	
Flt Protected		0.978					0.950			0.950		
Satd. Flow (prot)	0	1695	0	0	1442	0	1805	3539	0	1805	1848	0
Flt Permitted		0.978					0.950			0.950		
Satd. Flow (perm)	0	1695	0	0	1442	0	1805	3539	0	1805	1848	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		104.9			57.0			58.9			95.8	
Travel Time (s)		7.6			4.1			4.2			6.9	
Confl. Peds. (#/hr)							14		30	30		14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	50%	0%	0%	0%	14%	0%	2%	0%	0%	2%	4%
Adj. Flow (vph)	22	2	25	0	0	9	39	982	1	33	1180	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	49	0	0	9	0	39	983	0	33	1239	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	2	23	0	0	8	36	903	1	30	1086	54
Future Volume (Veh/h)	20	2	23	0	0	8	36	903	1	30	1086	54
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	2	25	0	0	9	39	982	1	33	1180	59
Pedestrians		14			30							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			3							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								136			183	
pX, platoon unblocked	0.47	0.47	0.44	0.47	0.47	0.93	0.44			0.93		
vC, conflicting volume	1868	2380	1224	2362	2410	522	1253			1013		
vC1, stage 1 conf vol	1290	1290		1090	1090							
vC2, stage 2 conf vol	578	1091		1272	1319							
vCu, unblocked vol	1750	2832	873	2794	2893	345	940			872		
tC, single (s)	7.5	7.5	6.9	7.5	6.5	7.2	4.1			4.1		
tC, 2 stage (s)	6.5	6.5		6.5	5.5							
tF (s)	3.5	4.5	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	78	97	81	100	100	98	88			95		
cM capacity (veh/h)	101	76	130	48	77	562	321			712		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	49	9	39	655	328	33	1239
Volume Left	22	0	39	0	0	33	0
Volume Right	25	9	0	0	1	0	59
cSH	112	562	321	1700	1700	712	1700
Volume to Capacity	0.44	0.02	0.12	0.39	0.19	0.05	0.73
Queue Length 95th (m)	15.0	0.4	3.3	0.0	0.0	1.2	0.0
Control Delay (s)	59.8	11.5	17.7	0.0	0.0	10.3	0.0
Lane LOS	F	B	C			B	
Approach Delay (s)	59.8	11.5	0.7			0.3	
Approach LOS	F	B					

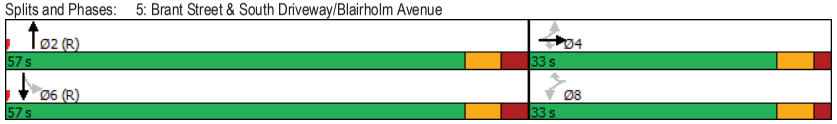
Intersection Summary					
Average Delay	1.7				
Intersection Capacity Utilization	76.5%	ICU Level of Service		D	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	4	19	41	0	93	0	821	12	30	753	0
Future Volume (vph)	26	4	19	41	0	93	0	821	12	30	753	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	0		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.98	0.94	0.97		0.97						
Frt			0.850			0.850		0.998				
Flt Protected		0.958		0.950						0.950		
Satd. Flow (prot)	0	1730	1615	1703	0	1553	0	3499	0	1805	1845	0
Flt Permitted		0.958		0.737						0.323		
Satd. Flow (perm)	0	1701	1526	1275	0	1505	0	3499	0	614	1845	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48			98		3				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.3			100.7			228.8			77.4	
Travel Time (s)		4.3			7.3			16.5			5.6	
Confl. Peds. (#/hr)	14		16	16		14	13					13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	0%	0%	6%	0%	4%	0%	3%	0%	0%	3%	0%
Adj. Flow (vph)	27	4	20	43	0	98	0	864	13	32	793	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	31	20	43	0	98	0	877	0	32	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1		1		2		1	2	
Detector Template	Left	Thru	Right	Left		Right		Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0		2.0		10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0		2.0		0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	4	8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0		8.0		8.0		8.0	8.0	
Minimum Split (s)	26.0	26.0	26.0	26.0		26.0		40.5		40.5	40.5	
Total Split (s)	33.0	33.0	33.0	33.0		33.0		57.0		57.0	57.0	
Total Split (%)	36.7%	36.7%	36.7%	36.7%		36.7%		63.3%		63.3%	63.3%	
Maximum Green (s)	27.0	27.0	27.0	27.0		27.0		50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0		4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0		3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Recall Mode	None	None	None	None		None		C-Max		C-Max	C-Max	
Walk Time (s)	10.0	10.0	10.0	10.0		10.0		25.0		25.0	25.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0		10.0		8.0		8.0	8.0	
Pedestrian Calls (#/hr)	0	0	0	0		0		0		0	0	
Act Effct Green (s)		9.3	9.3	9.3		9.3		71.9		71.9	71.9	
Actuated g/C Ratio		0.10	0.10	0.10		0.10		0.80		0.80	0.80	
v/c Ratio		0.18	0.10	0.33		0.40		0.31		0.07	0.54	
Control Delay		38.5	3.3	43.8		13.2		5.4		8.0	12.8	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		38.5	3.3	43.8		13.2		5.4		8.0	12.8	
LOS		D	A	D		B		A		A	B	
Approach Delay		24.7			22.5			5.4			12.6	
Approach LOS		C			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 73 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 10.3		Intersection LOS: B	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Brant Street & South Driveway/Blairholm Avenue



Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	31	20	43	98	877	32	793
v/c Ratio	0.18	0.10	0.33	0.40	0.31	0.07	0.54
Control Delay	38.5	3.3	43.8	13.2	5.4	8.0	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	3.3	43.8	13.2	5.4	8.0	12.8
Queue Length 50th (m)	5.3	0.0	7.5	0.0	41.2	2.6	86.8
Queue Length 95th (m)	13.4	1.9	17.4	14.0	41.1	m5.0	140.8
Internal Link Dist (m)	35.3				204.8		53.4
Turn Bay Length (m)			15.0			15.0	
Base Capacity (vph)	510	491	382	520	2796	490	1474
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.04	0.11	0.19	0.31	0.07	0.54

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	4	19	41	0	93	0	821	12	30	753	0
Future Volume (vph)	26	4	19	41	0	93	0	821	12	30	753	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00	1.00		1.00		0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.94	1.00		0.97		1.00		1.00	1.00	
Flpb, ped/bikes		0.98	1.00	0.97		1.00		1.00		1.00	1.00	
Frt		1.00	0.85	1.00		0.85		1.00		1.00	1.00	
Flt Protected		0.96	1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1702	1526	1644		1505		3499		1805	1845	
Flt Permitted		0.96	1.00	0.74		1.00		1.00		0.32	1.00	
Satd. Flow (perm)		1702	1526	1275		1505		3499		614	1845	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	4	20	43	0	98	0	864	13	32	793	0
RTOR Reduction (vph)	0	0	18	0	0	90	0	1	0	0	0	0
Lane Group Flow (vph)	0	31	2	43	0	8	0	876	0	32	793	0
Confl. Peds. (#/hr)	14		16	16		14	13					13
Heavy Vehicles (%)	6%	0%	0%	6%	0%	4%	0%	3%	0%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Actuated Green, G (s)		7.7	7.7	7.7		7.7		69.3		69.3	69.3	
Effective Green, g (s)		7.7	7.7	7.7		7.7		69.3		69.3	69.3	
Actuated g/C Ratio		0.09	0.09	0.09		0.09		0.77		0.77	0.77	
Clearance Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		145	130	109		128		2694		472	1420	
v/s Ratio Prot								0.25			c0.43	
v/s Ratio Perm		0.02	0.00	c0.03		0.01				0.05		
v/c Ratio		0.21	0.01	0.39		0.07		0.33		0.07	0.56	
Uniform Delay, d1		38.3	37.7	38.9		37.8		3.2		2.5	4.2	
Progression Factor		1.00	1.00	1.00		1.00		1.50		2.30	2.41	
Incremental Delay, d2		0.7	0.0	2.3		0.2		0.3		0.2	1.2	
Delay (s)		39.1	37.7	41.3		38.1		5.0		6.0	11.3	
Level of Service		D	D	D		D		A		A	B	
Approach Delay (s)		38.5			39.0			5.0			11.0	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

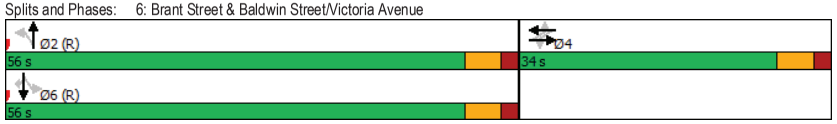
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	15	9	10	7	60	12	695	12	51	587	52
Future Volume (vph)	74	15	9	10	7	60	12	695	12	51	587	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	40.0		0.0	15.0		0.0	45.0		50.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. 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
Ped Bike Factor	0.98	0.98		0.96	0.97		0.97	1.00		0.98		0.88
Frt		0.942			0.866			0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1707	0	1517	1460	0	1805	1746	0	1570	1727	1615
Flt Permitted	0.709			0.740			0.386			0.318		
Satd. Flow (perm)	1275	1707	0	1132	1460	0	709	1746	0	515	1727	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			65			2				57
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		105.7			113.2			98.7			228.8	
Travel Time (s)		9.5			10.2			7.1			16.5	
Confl. Peds. (#/hr)	16		24	24		16	79		64	64		79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	6%	19%	0%	11%	0%	8%	27%	15%	10%	0%
Adj. Flow (vph)	80	16	10	11	8	65	13	755	13	55	638	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	26	0	11	73	0	13	768	0	55	638	57
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Detector Phase	4	4		4	4		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	32.0	32.0		32.0	32.0		42.0	42.0		42.0	42.0	42.0
Total Split (s)	34.0	34.0		34.0	34.0		56.0	56.0		56.0	56.0	56.0
Total Split (%)	37.8%	37.8%		37.8%	37.8%		62.2%	62.2%		62.2%	62.2%	62.2%
Maximum Green (s)	28.0	28.0		28.0	28.0		50.0	50.0		50.0	50.0	50.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	25.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	11.4	11.4		11.4	11.4		70.6	70.6		70.6	70.6	70.6
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.78	0.78		0.78	0.78	0.78
v/c Ratio	0.50	0.12		0.08	0.30		0.02	0.56		0.14	0.47	0.05
Control Delay	46.3	24.9		33.6	14.1		4.1	7.6		7.0	7.2	3.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	46.3	24.9		33.6	14.1		4.1	7.6		7.0	7.2	3.3
LOS	D	C		C	B		A	A		A	A	A
Approach Delay		41.1			16.6			7.5			6.9	
Approach LOS		D			B			A			A	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 36 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 9.8 Intersection LOS: A
Intersection Capacity Utilization 68.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Brant Street & Baldwin Street/Victoria Avenue



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	80	26	11	73	13	768	55	638	57
v/c Ratio	0.50	0.12	0.08	0.30	0.02	0.56	0.14	0.47	0.05
Control Delay	46.3	24.9	33.6	14.1	4.1	7.6	7.0	7.2	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	24.9	33.6	14.1	4.1	7.6	7.0	7.2	3.3
Queue Length 50th (m)	13.9	2.6	1.8	1.3	0.5	51.7	2.0	23.4	0.1
Queue Length 95th (m)	26.9	9.6	6.4	12.9	2.4	102.2	m10.1	107.3	m5.9
Internal Link Dist (m)		81.7		89.2		74.7		204.8	
Turn Bay Length (m)	15.0		40.0		15.0		45.0		50.0
Base Capacity (vph)	396	537	352	499	556	1369	404	1354	1123
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.05	0.03	0.15	0.02	0.56	0.14	0.47	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	15	9	10	7	60	12	695	12	51	587	52
Future Volume (vph)	74	15	9	10	7	60	12	695	12	51	587	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	1.00		1.00	1.00	0.88
Flpb, ped/bikes	0.98	1.00		0.96	1.00		0.96	1.00		0.98	1.00	1.00
Frt	1.00	0.94		1.00	0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1708	1708		1454	1461		1734	1747		1531	1727	1417
Flt Permitted	0.71	1.00		0.74	1.00		0.39	1.00		0.32	1.00	1.00
Satd. Flow (perm)	1276	1708		1133	1461		704	1747		513	1727	1417
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)	80	16	10	11	8	65	13	755	13	55	638	57
RTOR Reduction (vph)	0	9	0	0	58	0	0	0	0	0	0	14
Lane Group Flow (vph)	80	17	0	11	15	0	13	768	0	55	638	43
Confl. Peds. (#/hr)	16		24	24		16	79		64	64		79
Heavy Vehicles (%)	4%	0%	6%	19%	0%	11%	0%	8%	27%	15%	10%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)	9.8	9.8		9.8	9.8		68.2	68.2		68.2	68.2	68.2
Effective Green, g (s)	9.8	9.8		9.8	9.8		68.2	68.2		68.2	68.2	68.2
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.76	0.76		0.76	0.76	0.76
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	138	185		123	159		533	1323		388	1308	1073
v/s Ratio Prot		0.01			0.01			c0.44			0.37	
v/s Ratio Perm	c0.06			0.01			0.02			0.11		0.03
v/c Ratio	0.58	0.09		0.09	0.09		0.02	0.58		0.14	0.49	0.04
Uniform Delay, d1	38.1	36.1		36.1	36.1		2.7	4.7		3.0	4.2	2.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.45	1.20	2.51
Incremental Delay, d2	5.8	0.2		0.3	0.3		0.1	1.9		0.7	1.1	0.1
Delay (s)	43.9	36.3		36.4	36.4		2.8	6.6		5.0	6.2	6.9
Level of Service	D	D		D	D		A	A		A	A	A
Approach Delay (s)		42.1			36.4			6.5			6.1	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	940	783	0
Future Volume (vph)	0	0	0	940	783	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	15.0			0.0
Storage Lanes	0	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	1863	3505	1845	0
Flt Permitted						
Satd. Flow (perm)	0	0	1863	3505	1845	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.1			77.4	58.9	
Travel Time (s)	3.6			5.6	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	0	0	0	1022	851	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1022	851	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	940	783	0
Future Volume (Veh/h)	0	0	0	940	783	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1022	851	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				77	242	
pX, platoon unblocked	0.69	0.65	0.65			
vC, conflicting volume	1362	851	851			
vC1, stage 1 conf vol	851					
vC2, stage 2 conf vol	511					
vCu, unblocked vol	892	507	507			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	347	334	689			

Direction, Lane #	NB 1	NB 2	NB 3	SB 1
Volume Total	0	511	511	851
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.30	0.30	0.50
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			0.0
Approach LOS				

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		44.5%	ICU Level of Service
Analysis Period (min)		15	

Intersection: 1: Brant Street & Fairview Street

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	321.0	323.6	288.3	78.2	82.4	282.2	262.0	134.7	92.5	187.8	182.8	87.5
Average Queue (m)	271.0	206.7	168.1	7.1	75.3	178.0	165.7	27.6	77.9	101.6	97.1	25.8
95th Queue (m)	390.4	411.8	369.1	41.3	99.9	290.0	269.9	88.7	110.4	179.6	171.8	85.3
Link Distance (m)	313.0	313.0	313.0			336.1	336.1	336.1		266.9	266.9	
Upstream Blk Time (%)	52	38	3			0	0			0	0	
Queuing Penalty (veh)	0	0	0			0	0			0	0	
Storage Bay Dist (m)				190.0	75.0				85.0			80.0
Storage Blk Time (%)			0		15	36			30	5	12	0
Queuing Penalty (veh)			0		87	97			115	16	24	0

Intersection: 1: Brant Street & Fairview Street

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	62.5	229.1	214.4	97.5
Average Queue (m)	60.4	160.6	143.4	44.8
95th Queue (m)	70.9	261.6	250.3	117.8
Link Distance (m)		224.1	224.1	
Upstream Blk Time (%)		20	9	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	55.0			90.0
Storage Blk Time (%)	22	53	24	0
Queuing Penalty (veh)	74	131	47	0

Intersection: 2: Brant Street & Grahams Lane/Prospect Street

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	47.4	91.7	27.5	121.1	18.0	60.9	57.0	27.4	273.2	282.7
Average Queue (m)	31.5	24.1	18.4	30.8	2.2	24.8	28.9	26.1	225.7	226.2
95th Queue (m)	51.5	72.2	31.7	84.6	9.5	45.4	50.7	33.9	320.1	337.9
Link Distance (m)		140.7		228.0		121.8	121.8		266.9	266.9
Upstream Blk Time (%)				0					5	9
Queuing Penalty (veh)				0					29	50
Storage Bay Dist (m)	40.0		20.0		20.0			20.0		
Storage Blk Time (%)	15	0	26	11	0	10		17	74	
Queuing Penalty (veh)	9	0	41	11	0	1		87	146	

Intersection: 3: Brant Street & Ghent Street

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	78.9	32.5	41.5	32.8	46.1	52.7	37.4	138.3	141.2
Average Queue (m)	39.1	11.1	16.7	14.2	17.9	19.6	13.9	128.5	122.9
95th Queue (m)	67.7	31.3	31.8	29.3	38.0	40.9	36.8	139.7	155.0
Link Distance (m)	163.0		152.7		67.2	67.2		121.8	121.8
Upstream Blk Time (%)					0	0		34	16
Queuing Penalty (veh)					0	0		195	90
Storage Bay Dist (m)		25.0		45.0			30.0		
Storage Blk Time (%)	23	0		0	0		0	45	
Queuing Penalty (veh)	8	0		1	0		0	21	

Intersection: 4: Brant Street & Olga Drive/Rambo Crescent

Movement	EB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	TR
Maximum Queue (m)	29.6	15.3	14.1	0.9	0.9	10.5	19.3
Average Queue (m)	10.9	2.5	4.9	0.0	0.0	3.0	0.9
95th Queue (m)	23.8	10.2	12.4	0.6	0.6	9.6	7.8
Link Distance (m)	93.5	41.8		40.4	40.4		77.0
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			20.0			15.0	
Storage Blk Time (%)			0			0	0
Queuing Penalty (veh)			1			1	0

Intersection: 5: Brant Street & South Driveway/Blairholm Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	R	T	TR	L	T
Maximum Queue (m)	22.2	14.8	22.1	35.5	50.0	49.6	22.2	66.0
Average Queue (m)	6.9	4.3	10.4	12.4	20.3	18.5	4.2	48.7
95th Queue (m)	17.4	12.1	21.1	24.2	42.4	41.3	13.4	76.9
Link Distance (m)	47.9	47.9		87.0	203.2	203.2		62.4
Upstream Blk Time (%)								3
Queuing Penalty (veh)								24
Storage Bay Dist (m)			15.0				15.0	
Storage Blk Time (%)			11	4			0	18
Queuing Penalty (veh)			10	2			1	5

Intersection: 6: Brant Street & Baldwin Street/Victoria Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (m)	22.0	30.5	13.9	26.8	9.9	98.3	52.3	117.2	56.8
Average Queue (m)	11.9	5.4	1.9	10.6	1.4	55.8	15.8	55.5	9.8
95th Queue (m)	21.7	19.5	8.7	21.3	6.7	102.6	40.2	104.3	36.3
Link Distance (m)		91.1		99.4		88.1		203.2	
Upstream Blk Time (%)						3			
Queuing Penalty (veh)						0			
Storage Bay Dist (m)	15.0		40.0		15.0		45.0		50.0
Storage Blk Time (%)	13	1			0	22	0	9	0
Queuing Penalty (veh)	3	1			0	3	0	10	0

Intersection: 7: Brant Street & North Driveway

Movement	NB	SB
Directions Served	T	TR
Maximum Queue (m)	3.0	41.8
Average Queue (m)	0.1	10.3
95th Queue (m)	2.1	33.5
Link Distance (m)	62.4	40.4
Upstream Blk Time (%)		0
Queuing Penalty (veh)		5
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1347

Appendix I

Total Traffic Operations

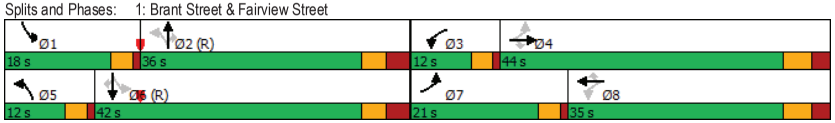
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	544	203	148	264	183	172	590	185	215	648	93
Future Volume (vph)	178	544	203	148	264	183	172	590	185	215	648	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		190.0	75.0		0.0	85.0		80.0	55.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00		0.96	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3406	1538	1687	3343	1509	1719	3539	1553	1671	3539	1392
Flt Permitted	0.434			0.309			0.312			0.298		
Satd. Flow (perm)	805	3406	1509	547	3343	1481	563	3539	1497	521	3539	1364
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			221			199			201			153
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		327.7			350.7			292.3			238.7	
Travel Time (s)		23.6			25.3			21.0			17.2	
Confl. Peds. (#/hr)	5		5	5		5	6		18	18		6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	6%	5%	7%	8%	7%	5%	2%	4%	8%	2%	16%
Adj. Flow (vph)	193	591	221	161	287	199	187	641	201	234	704	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	193	591	221	161	287	199	187	641	201	234	704	101
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes				
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	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%
Maximum Green (s)	17.0	37.6	37.6	8.0	28.6	28.6	8.0	29.5	29.5	14.0	35.5	35.5
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?												
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
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	39.4	25.5	25.5	30.2	19.8	19.8	55.5	41.7	41.7	60.4	44.4	44.4
Actuated g/C Ratio	0.36	0.23	0.23	0.27	0.18	0.18	0.50	0.38	0.38	0.55	0.40	0.40
v/c Ratio	0.47	0.75	0.43	0.69	0.48	0.46	0.47	0.48	0.29	0.54	0.49	0.16
Control Delay	28.2	45.2	6.8	42.4	43.0	9.0	17.2	29.2	5.4	18.2	27.3	1.6
Queue Delay	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 Delay	28.2	45.2	6.8	42.4	43.0	9.0	17.2	29.2	5.4	18.2	27.3	1.6
LOS	C	D	A	D	D	A	B	C	A	B	C	A
Approach Delay		33.5			32.4			22.4			22.8	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 27.2 — Intersection LOS: C
Intersection Capacity Utilization 73.3% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	193	591	221	161	287	199	187	641	201	234	704	101
v/c Ratio	0.47	0.75	0.43	0.69	0.48	0.46	0.47	0.48	0.29	0.54	0.49	0.16
Control Delay	28.2	45.2	6.8	42.4	43.0	9.0	17.2	29.2	5.4	18.2	27.3	1.6
Queue Delay	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 Delay	28.2	45.2	6.8	42.4	43.0	9.0	17.2	29.2	5.4	18.2	27.3	1.6
Queue Length 50th (m)	30.9	65.7	0.0	25.4	31.0	0.0	19.5	56.5	0.0	25.3	61.3	0.0
Queue Length 95th (m)	45.0	79.7	18.0	#39.3	43.3	19.4	36.4	88.4	17.7	45.7	90.8	3.6
Internal Link Dist (m)		303.7			326.7			268.3			214.7	
Turn Bay Length (m)			190.0	75.0			85.0		80.0	55.0		90.0
Base Capacity (vph)	441	1164	661	233	869	532	402	1342	693	453	1427	641
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.51	0.33	0.69	0.33	0.37	0.47	0.48	0.29	0.52	0.49	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	544	203	148	264	183	172	590	185	215	648	93
Future Volume (vph)	178	544	203	148	264	183	172	590	185	215	648	93
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	0.98
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)	1767	3406	1509	1686	3343	1481	1718	3539	1497	1668	3539	1364
Flt Permitted	0.43	1.00	1.00	0.31	1.00	1.00	0.31	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	807	3406	1509	548	3343	1481	564	3539	1497	524	3539	1364
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)	193	591	221	161	287	199	187	641	201	234	704	101
RTOR Reduction (vph)	0	0	170	0	0	163	0	0	125	0	0	60
Lane Group Flow (vph)	193	591	51	161	287	36	187	641	76	234	704	41
Confl. Peds. (#/hr)	5		5	5		5	6		18	18		6
Heavy Vehicles (%)	2%	6%	5%	7%	8%	7%	5%	2%	4%	8%	2%	16%
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)	37.5	25.5	25.5	27.8	19.8	19.8	52.9	41.7	41.7	58.3	44.4	44.4
Effective Green, g (s)	37.5	25.5	25.5	27.8	19.8	19.8	52.9	41.7	41.7	58.3	44.4	44.4
Actuated g/C Ratio	0.34	0.23	0.23	0.25	0.18	0.18	0.48	0.38	0.38	0.53	0.40	0.40
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)	394	789	349	221	601	266	388	1341	567	422	1428	550
v/s Ratio Prot	0.06	c0.17		c0.05	0.09		0.05	0.18		c0.07	0.20	
v/s Ratio Perm	0.11		0.03	0.13		0.02	0.18		0.05	c0.22		0.03
v/c Ratio	0.49	0.75	0.15	0.73	0.48	0.13	0.48	0.48	0.13	0.55	0.49	0.07
Uniform Delay, d1	27.0	39.3	33.6	34.6	40.5	37.9	17.0	25.9	22.3	15.1	24.4	20.2
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	1.0	3.9	0.2	11.4	0.6	0.2	0.9	1.2	0.5	1.6	1.2	0.3
Delay (s)	28.0	43.2	33.8	45.9	41.1	38.1	18.0	27.1	22.8	16.7	25.6	20.4
Level of Service	C	D	C	D	D	D	B	C	C	B	C	C
Approach Delay (s)		38.2			41.4			24.6			23.1	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	73.3%	ICU Level of Service	D	
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)	50	7	17	67	5	100	29	874	67	106	1053	91
Future Volume (vph)	50	7	17	67	5	100	29	874	67	106	1053	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		0.99	1.00	
Frt		0.894			0.858			0.989			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1670	0	1770	1585	0	1805	3447	0	1770	3454	0
Flt Permitted	0.681			0.740			0.161			0.229		
Satd. Flow (perm)	1179	1670	0	1363	1585	0	305	3447	0	423	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			112			13			15	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.9			245.1			144.7			292.3	
Travel Time (s)		11.2			17.6			10.4			21.0	
Confl. Peds. (#/hr)	7		11	11		7	18		29	29		18
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	9%	0%	0%	2%	0%	1%	0%	3%	5%	2%	3%	2%
Adj. Flow (vph)	56	8	19	75	6	112	33	982	75	119	1183	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	27	0	75	118	0	33	1057	0	119	1285	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		41.0	41.0		10.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	12.0	12.0		12.0	12.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	10.7	10.7		10.7	10.7		55.2	55.2		66.3	55.2	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.61	0.61		0.74	0.61	
v/c Ratio	0.40	0.13		0.46	0.41		0.18	0.50		0.28	0.61	
Control Delay	44.4	19.6		45.7	12.5		8.8	6.5		4.8	12.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.1	
Total Delay	44.4	19.6		45.7	12.5		8.8	6.5		4.8	12.8	
LOS	D	B		D	B		A	A		A	B	
Approach Delay		36.3			25.4			6.6			12.1	
Approach LOS		D			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 43 (48%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 11.6		Intersection LOS: B	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Brant Street & Grahams Lane/Prospect Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	27	75	118	33	1057	119	1285
v/c Ratio	0.40	0.13	0.46	0.41	0.18	0.50	0.28	0.61
Control Delay	44.4	19.6	45.7	12.5	8.8	6.5	4.8	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Total Delay	44.4	19.6	45.7	12.5	8.8	6.5	4.8	12.8
Queue Length 50th (m)	9.6	1.3	13.0	1.0	0.8	13.4	4.1	66.6
Queue Length 95th (m)	20.4	8.4	25.4	15.4	m5.2	53.7	9.7	102.4
Internal Link Dist (m)		130.9		221.1		120.7		268.3
Turn Bay Length (m)	40.0		20.0		20.0		20.0	
Base Capacity (vph)	209	312	242	373	187	2118	455	2123
Starvation Cap Reductn	0	0	0	0	0	147	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	125
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.09	0.31	0.32	0.18	0.54	0.26	0.64

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	7	17	67	5	100	29	874	67	106	1053	91
Future Volume (vph)	50	7	17	67	5	100	29	874	67	106	1053	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	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	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1645	1671		1749	1584		1799	3449		1767	3454	
Flt Permitted	0.68	1.00		0.74	1.00		0.16	1.00		0.23	1.00	
Satd. Flow (perm)	1180	1671		1362	1584		305	3449		426	3454	
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)	56	8	19	75	6	112	33	982	75	119	1183	102
RTOR Reduction (vph)	0	17	0	0	99	0	0	5	0	0	6	0
Lane Group Flow (vph)	56	10	0	75	19	0	33	1052	0	119	1279	0
Confl. Peds. (#/hr)	7		11	11		7	18		29	29		18
Heavy Vehicles (%)	9%	0%	0%	2%	0%	1%	0%	3%	5%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	10.7	10.7		10.7	10.7		55.2	55.2		62.3	55.2	
Effective Green, g (s)	10.7	10.7		10.7	10.7		55.2	55.2		62.3	55.2	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.61	0.61		0.69	0.61	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	198		161	188		187	2115		400	2118	
v/s Ratio Prot		0.01			0.01			0.31		c0.02	c0.37	
v/s Ratio Perm	0.05			c0.06			0.11			0.18		
v/c Ratio	0.40	0.05		0.47	0.10		0.18	0.50		0.30	0.60	
Uniform Delay, d1	36.7	35.2		37.0	35.4		7.5	9.7		5.1	10.7	
Progression Factor	1.00	1.00		1.00	1.00		0.70	0.56		1.00	1.00	
Incremental Delay, d2	1.9	0.1		2.1	0.2		1.9	0.8		0.4	1.3	
Delay (s)	38.6	35.3		39.1	35.6		7.1	6.1		5.5	12.0	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		37.5			37.0			6.2			11.4	
Approach LOS		D			D			A			B	

Intersection Summary					
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.55				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0		
Intersection Capacity Utilization	69.2%	ICU Level of Service	C		
Analysis Period (min)	15				

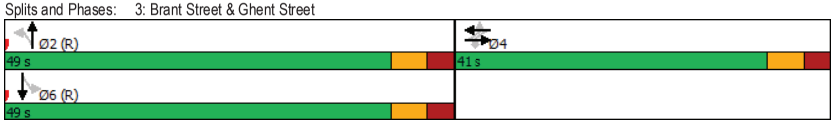
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	238	23	29	23	25	30	18	829	33	21	1185	47
Future Volume (vph)	238	23	29	23	25	30	18	829	33	21	1185	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		25.0	0.0		0.0	45.0		0.0	30.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		0.99		1.00	1.00		0.99	1.00	
Frt			0.850		0.948			0.994			0.994	
Flt Protected		0.956			0.985		0.950			0.950		
Satd. Flow (prot)	0	1816	1615	0	1673	0	1805	3477	0	1805	3511	0
Flt Permitted		0.687			0.852		0.154			0.281		
Satd. Flow (perm)	0	1299	1575	0	1443	0	292	3477	0	526	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		31			6			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		177.0			166.8			87.4			144.7	
Travel Time (s)		12.7			12.0			6.3			10.4	
Confl. Peds. (#/hr)	7		15	15		7	21		36	36		21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	9%	0%	7%	0%	3%	0%	0%	2%	2%
Adj. Flow (vph)	245	24	30	24	26	31	19	855	34	22	1222	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	269	30	0	81	0	19	889	0	22	1270	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		24.0	24.0		24.0		52.0	52.0		52.0	52.0	
Actuated g/C Ratio		0.27	0.27		0.27		0.58	0.58		0.58	0.58	
v/c Ratio		0.78	0.07		0.20		0.11	0.44		0.07	0.62	
Control Delay		45.3	3.2		16.1		13.5	13.0		4.5	9.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.2	
Total Delay		45.3	3.2		16.1		13.5	13.0		4.5	9.7	
LOS		D	A		B		B	B		A	A	
Approach Delay		41.1			16.1			13.0			9.6	
Approach LOS		D			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 63 (70%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.7		Intersection LOS: B	
Intersection Capacity Utilization 76.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Brant Street & Ghent Street



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	269	30	81	19	889	22	1270
v/c Ratio	0.78	0.07	0.20	0.11	0.44	0.07	0.62
Control Delay	45.3	3.2	16.1	13.5	13.0	4.5	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	45.3	3.2	16.1	13.5	13.0	4.5	9.7
Queue Length 50th (m)	45.1	0.0	6.9	1.7	47.2	0.5	87.5
Queue Length 95th (m)	65.0	3.5	15.9	m4.9	52.0	m1.4	134.0
Internal Link Dist (m)	153.0		142.8		63.4		120.7
Turn Bay Length (m)		25.0		45.0		30.0	
Base Capacity (vph)	490	624	564	168	2012	303	2032
Starvation Cap Reductn	0	0	0	0	0	0	198
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.05	0.14	0.11	0.44	0.07	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	238	23	29	23	25	30	18	829	33	21	1185	47
Future Volume (vph)	238	23	29	23	25	30	18	829	33	21	1185	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		0.98	1.00	
Frt		1.00	0.85		0.95		1.00	0.99		1.00	0.99	
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1808	1575		1670		1797	3478		1776	3512	
Flt Permitted		0.69	1.00		0.85		0.15	1.00		0.28	1.00	
Satd. Flow (perm)		1300	1575		1443		291	3478		525	3512	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	245	24	30	24	26	31	19	855	34	22	1222	48
RTOR Reduction (vph)	0	0	22	0	23	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	269	8	0	58	0	19	886	0	22	1267	0
Confl. Peds. (#/hr)	7		15	15		7	21		36	36		21
Heavy Vehicles (%)	0%	0%	0%	9%	0%	7%	0%	3%	0%	0%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Actuated Green, G (s)		24.0	24.0		24.0		52.0	52.0		52.0	52.0	
Effective Green, g (s)		24.0	24.0		24.0		52.0	52.0		52.0	52.0	
Actuated g/C Ratio		0.27	0.27		0.27		0.58	0.58		0.58	0.58	
Clearance Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		346	420		384		168	2009		303	2029	
v/s Ratio Prot								0.25			c0.36	
v/s Ratio Perm		c0.21	0.01		0.04		0.07			0.04		
v/c Ratio		0.78	0.02		0.15		0.11	0.44		0.07	0.62	
Uniform Delay, d1		30.5	24.3		25.2		8.6	10.8		8.4	12.6	
Progression Factor		1.00	1.00		1.00		1.00	1.03		0.36	0.59	
Incremental Delay, d2		10.5	0.0		0.2		1.3	0.7		0.4	1.2	
Delay (s)		41.0	24.3		25.4		9.9	11.8		3.4	8.6	
Level of Service		D	C		C		A	B		A	A	
Approach Delay (s)		39.4			25.4			11.7			8.5	
Approach LOS		D			C			B			A	

Intersection Summary					
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0		
Intersection Capacity Utilization	76.7%	ICU Level of Service	D		
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)	30	3	53	3	0	9	23	836	2	17	1209	12
Future Volume (vph)	30	3	53	3	0	9	23	836	2	17	1209	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.917			0.896						0.999	
Flt Protected		0.983			0.989		0.950			0.950		
Satd. Flow (prot)	0	1652	0	0	1684	0	1641	3471	0	1687	1809	0
Flt Permitted		0.983			0.989		0.950			0.950		
Satd. Flow (perm)	0	1652	0	0	1684	0	1641	3471	0	1687	1809	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		104.9			57.0			58.9			95.8	
Travel Time (s)		7.6			4.1			4.2			6.9	
Confl. Peds. (#/hr)							64		56	56		64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	10%	4%	0%	7%	5%	0%
Adj. Flow (vph)	33	3	58	3	0	10	25	909	2	18	1314	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	13	0	25	911	0	18	1327	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary					
Area Type:	Other				
Control Type: Unsignalized					
Intersection Capacity Utilization	78.8%		ICU Level of Service D		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	3	53	3	0	9	23	836	2	17	1209	12
Future Volume (Veh/h)	30	3	53	3	0	9	23	836	2	17	1209	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	3	58	3	0	10	25	909	2	18	1314	13
Pedestrians		64			56							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		5			5							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								136			183	
pX, platoon unblocked	0.47	0.47	0.43	0.47	0.47	0.93	0.43			0.93		
vC, conflicting volume	1935	2438	1384	2426	2443	512	1391			967		
vC1, stage 1 conf vol	1420	1420		1016	1016							
vC2, stage 2 conf vol	514	1017		1410	1427							
vCu, unblocked vol	1855	2934	1231	2909	2946	319	1246			809		
tC, single (s)	7.5	6.5	7.0	7.5	6.5	6.9	4.3			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	49	96	13	0	100	98	88			97		
cM capacity (veh/h)	65	83	66	0	61	604	208			691		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	94	13	25	606	305	18	1327
Volume Left	33	3	25	0	0	18	0
Volume Right	58	10	0	0	2	0	13
cSH	66	1	208	1700	1700	691	1700
Volume to Capacity	1.42	9.19	0.12	0.36	0.18	0.03	0.78
Queue Length 95th (m)	63.3	Err	3.2	0.0	0.0	0.6	0.0
Control Delay (s)	360.8	Err	24.6	0.0	0.0	10.4	0.0
Lane LOS	F	F	C			B	
Approach Delay (s)	360.8	Err	0.7			0.1	
Approach LOS	F	F					

Intersection Summary					
Average Delay		69.0			
Intersection Capacity Utilization		78.8%	ICU Level of Service		D
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	0	18	39	0	137	0	657	23	51	735	0
Future Volume (vph)	76	0	18	39	0	137	0	657	23	51	735	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	0		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.98	0.84	0.87		0.97		1.00		0.98		
Frt			0.850			0.850		0.995				
Flt Protected		0.950		0.950						0.950		
Satd. Flow (prot)	0	902	1615	1626	0	1509	0	3171	0	1656	1743	0
Flt Permitted		0.950		0.699						0.341		
Satd. Flow (perm)	0	884	1358	1047	0	1461	0	3171	0	580	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48			131		6				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.3			100.7			228.8			77.4	
Travel Time (s)		4.3			7.3			16.5			5.6	
Confl. Peds. (#/hr)	15		63	63		15	119		60	60		119
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	100%	0%	0%	11%	0%	7%	0%	13%	10%	9%	9%	0%
Adj. Flow (vph)	89	0	21	46	0	161	0	773	27	60	865	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	89	21	46	0	161	0	800	0	60	865	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1		1		2		1	2	
Detector Template	Left	Thru	Right	Left		Right		Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0		2.0		10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0		2.0		0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	4	8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0		8.0		8.0		8.0	8.0	
Minimum Split (s)	26.0	26.0	26.0	26.0		26.0		40.5		40.5	40.5	
Total Split (s)	33.0	33.0	33.0	33.0		33.0		57.0		57.0	57.0	
Total Split (%)	36.7%	36.7%	36.7%	36.7%		36.7%		63.3%		63.3%	63.3%	
Maximum Green (s)	27.0	27.0	27.0	27.0		27.0		50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0		4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0		3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Recall Mode	None	None	None	None		None		C-Max		C-Max	C-Max	
Walk Time (s)	10.0	10.0	10.0	10.0		10.0		25.0		25.0	25.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0		10.0		8.0		8.0	8.0	
Pedestrian Calls (#/hr)	0	0	0	0		0		0		0	0	
Act Effct Green (s)		14.6	14.6	14.6		14.6		62.4		62.4	62.4	
Actuated g/C Ratio		0.16	0.16	0.16		0.16		0.69		0.69	0.69	
v/c Ratio		0.62	0.08	0.27		0.46		0.36		0.15	0.72	
Control Delay		52.4	2.7	34.7		13.1		6.9		9.3	16.4	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		52.4	2.7	34.7		13.1		6.9		9.3	16.4	
LOS		D	A	C		B		A		A	B	
Approach Delay		42.9			17.9			6.9			15.9	
Approach LOS		D			B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 55 (61%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 75.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 5: Brant Street & South Driveway/Blairholm Avenue



Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	89	21	46	161	800	60	865
v/c Ratio	0.62	0.08	0.27	0.46	0.36	0.15	0.72
Control Delay	52.4	2.7	34.7	13.1	6.9	9.3	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	2.7	34.7	13.1	6.9	9.3	16.4
Queue Length 50th (m)	15.3	0.0	7.5	4.8	22.0	2.5	51.2
Queue Length 95th (m)	26.7	1.5	15.1	17.7	50.3	m9.6	115.8
Internal Link Dist (m)	35.3				204.8		53.4
Turn Bay Length (m)			15.0			15.0	
Base Capacity (vph)	265	441	314	530	2199	402	1208
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.05	0.15	0.30	0.36	0.15	0.72

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	0	18	39	0	137	0	657	23	51	735	0
Future Volume (vph)	76	0	18	39	0	137	0	657	23	51	735	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00	1.00		1.00		0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.84	1.00		0.97		1.00		1.00	1.00	
Flpb, ped/bikes		0.98	1.00	0.87		1.00		1.00		0.97	1.00	
Frt		1.00	0.85	1.00		0.85		0.99		1.00	1.00	
Flt Protected		0.95	1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		884	1358	1422		1461		3171		1612	1743	
Flt Permitted		0.95	1.00	0.70		1.00		1.00		0.34	1.00	
Satd. Flow (perm)		884	1358	1047		1461		3171		579	1743	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	89	0	21	46	0	161	0	773	27	60	865	0
RTOR Reduction (vph)	0	0	18	0	0	110	0	2	0	0	0	0
Lane Group Flow (vph)	0	89	3	46	0	51	0	798	0	60	865	0
Confl. Peds. (#/hr)	15		63	63		15	119		60	60		119
Heavy Vehicles (%)	100%	0%	0%	11%	0%	7%	0%	13%	10%	9%	9%	0%
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Actuated Green, G (s)		14.6	14.6	14.6		14.6		62.4		62.4	62.4	
Effective Green, g (s)		14.6	14.6	14.6		14.6		62.4		62.4	62.4	
Actuated g/C Ratio		0.16	0.16	0.16		0.16		0.69		0.69	0.69	
Clearance Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		143	220	169		237		2198		401	1208	
v/s Ratio Prot								0.25			c0.50	
v/s Ratio Perm		0.10	0.00	0.04		0.04				0.10		
v/c Ratio		0.62	0.02	0.27		0.22		0.36		0.15	0.72	
Uniform Delay, d1		35.1	31.7	33.0		32.7		5.7		4.7	8.4	
Progression Factor		1.00	1.00	1.00		1.00		1.01		1.32	1.25	
Incremental Delay, d2		8.2	0.0	0.9		0.5		0.4		0.7	3.2	
Delay (s)		43.3	31.7	33.9		33.2		6.1		6.9	13.7	
Level of Service		D	C	C		C		A		A	B	
Approach Delay (s)		41.1			33.4			6.1			13.3	
Approach LOS		D			C			A			B	

Intersection Summary					
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	75.6%	ICU Level of Service		D	
Analysis Period (min)	15				

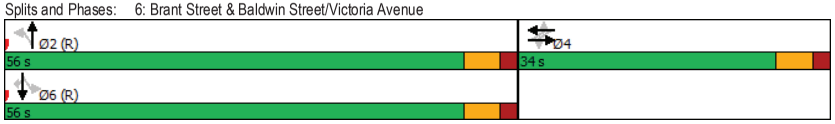
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	14	26	14	44	60	12	625	15	42	548	166
Future Volume (vph)	75	14	26	14	44	60	12	625	15	42	548	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	40.0		0.0	15.0		0.0	45.0		50.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. 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
Ped Bike Factor	0.82	0.90		0.87	0.88		0.97	1.00		0.96		0.91
Frt		0.902			0.914			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1546	0	1671	1441	0	1805	1849	0	1752	1810	1583
Flt Permitted	0.685			0.729			0.406			0.351		
Satd. Flow (perm)	1070	1546	0	1122	1441	0	752	1849	0	622	1810	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			64			2				177
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		105.7			113.2			98.7			228.8	
Travel Time (s)		9.5			10.2			7.1			16.5	
Confl. Peds. (#/hr)	192		74	74		192	54		105	105		54
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	8%	5%	6%	0%	2%	0%	3%	5%	2%
Adj. Flow (vph)	80	15	28	15	47	64	13	665	16	45	583	177
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	43	0	15	111	0	13	681	0	45	583	177
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Detector Phase	4	4		4	4		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	32.0	32.0		32.0	32.0		42.0	42.0		42.0	42.0	42.0
Total Split (s)	34.0	34.0		34.0	34.0		56.0	56.0		56.0	56.0	56.0
Total Split (%)	37.8%	37.8%		37.8%	37.8%		62.2%	62.2%		62.2%	62.2%	62.2%
Maximum Green (s)	28.0	28.0		28.0	28.0		50.0	50.0		50.0	50.0	50.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	25.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	12.5	12.5		12.5	12.5		65.5	65.5		65.5	65.5	65.5
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.73	0.73		0.73	0.73	0.73
v/c Ratio	0.54	0.18		0.10	0.44		0.02	0.51		0.10	0.44	0.16
Control Delay	48.5	18.3		32.7	21.6		4.7	7.5		1.5	2.6	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.5	18.3		32.7	21.6		4.7	7.5		1.5	2.6	0.5
LOS	D	B		C	C		A	A		A	A	A
Approach Delay		37.9			22.9			7.5			2.1	
Approach LOS		D			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 82 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 70.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Brant Street & Baldwin Street/Victoria Avenue



Queues
6: Brant Street & Baldwin Street/Victoria Avenue

Future Total
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	80	43	15	111	13	681	45	583	177
v/c Ratio	0.54	0.18	0.10	0.44	0.02	0.51	0.10	0.44	0.16
Control Delay	48.5	18.3	32.7	21.6	4.7	7.5	1.5	2.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	18.3	32.7	21.6	4.7	7.5	1.5	2.6	0.5
Queue Length 50th (m)	13.8	2.4	2.4	7.8	0.6	43.3	0.4	10.9	0.5
Queue Length 95th (m)	26.7	11.1	7.7	21.9	2.6	85.9	m0.5	12.9	m0.0
Internal Link Dist (m)		81.7		89.2		74.7		204.8	
Turn Bay Length (m)	15.0		40.0		15.0		45.0		50.0
Base Capacity (vph)	332	500	349	492	547	1346	452	1317	1096
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.09	0.04	0.23	0.02	0.51	0.10	0.44	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
6: Brant Street & Baldwin Street/Victoria Avenue

Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	14	26	14	44	60	12	625	15	42	548	166
Future Volume (vph)	75	14	26	14	44	60	12	625	15	42	548	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.90		1.00	0.88		1.00	1.00		1.00	1.00	0.91
Flpb, ped/bikes	0.82	1.00		0.87	1.00		0.97	1.00		0.95	1.00	1.00
Frt	1.00	0.90		1.00	0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1484	1546		1462	1440		1752	1850		1670	1810	1441
Flt Permitted	0.69	1.00		0.73	1.00		0.41	1.00		0.35	1.00	1.00
Satd. Flow (perm)	1071	1546		1122	1440		748	1850		617	1810	1441
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	80	15	28	15	47	64	13	665	16	45	583	177
RTOR Reduction (vph)	0	24	0	0	55	0	0	1	0	0	0	48
Lane Group Flow (vph)	80	19	0	15	56	0	13	680	0	45	583	129
Confl. Peds. (#/hr)	192		74	74		192	54		105	105		54
Heavy Vehicles (%)	0%	0%	0%	8%	5%	6%	0%	2%	0%	3%	5%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)	12.5	12.5		12.5	12.5		65.5	65.5		65.5	65.5	65.5
Effective Green, g (s)	12.5	12.5		12.5	12.5		65.5	65.5		65.5	65.5	65.5
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.73	0.73		0.73	0.73	0.73
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	148	214		155	200		544	1346		449	1317	1048
v/s Ratio Prot		0.01			0.04			c0.37			0.32	
v/s Ratio Perm	c0.07			0.01			0.02			0.07		0.09
v/c Ratio	0.54	0.09		0.10	0.28		0.02	0.51		0.10	0.44	0.12
Uniform Delay, d1	36.1	33.8		33.8	34.7		3.4	5.3		3.6	4.9	3.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.24	0.32	0.27
Incremental Delay, d2	4.0	0.2		0.3	0.8		0.1	1.4		0.3	0.8	0.2
Delay (s)	40.1	34.0		34.1	35.5		3.5	6.6		1.2	2.4	1.2
Level of Service	D	C		C	D		A	A		A	A	A
Approach Delay (s)		37.9			35.3			6.6			2.1	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	70.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	11	861	786	51
Future Volume (vph)	0	0	11	861	786	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	15.0			0.0
Storage Lanes	0	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt					0.992	
Flt Protected			0.950			
Satd. Flow (prot)	0	0	1770	3539	1848	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	1770	3539	1848	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.1			77.4	58.9	
Travel Time (s)	3.6			5.6	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	12	936	854	55
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	12	936	909	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	11	861	786	51
Future Volume (Veh/h)	0	0	11	861	786	51
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	12	936	854	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				77	242	
pX, platoon unblocked	0.73	0.69	0.69			
vC, conflicting volume	1374	882	909			
vC1, stage 1 conf vol	882					
vC2, stage 2 conf vol	492					
vCu, unblocked vol	884	605	645			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	98			
cM capacity (veh/h)	333	305	647			

Direction, Lane #	NB 1	NB 2	NB 3	SB 1
Volume Total	12	468	468	909
Volume Left	12	0	0	0
Volume Right	0	0	0	55
cSH	647	1700	1700	1700
Volume to Capacity	0.02	0.28	0.28	0.53
Queue Length 95th (m)	0.5	0.0	0.0	0.0
Control Delay (s)	10.7	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	0.1			0.0
Approach LOS				

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		47.8%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection: 1: Brant Street & Fairview Street

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	48.6	91.3	79.2	53.3	82.4	176.4	162.3	15.3	61.1	81.9	77.3	48.8
Average Queue (m)	26.7	56.6	47.4	7.8	55.4	69.6	56.1	0.8	26.0	40.8	43.9	3.5
95th Queue (m)	45.3	80.9	72.4	37.5	97.3	173.3	156.9	8.6	50.3	67.5	69.8	22.5
Link Distance (m)	313.0	313.0	313.0			336.1	336.1	336.1		266.9	266.9	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)				190.0	75.0				85.0			80.0
Storage Blk Time (%)					32	1			0	0	0	0
Queuing Penalty (veh)					42	2			1	0	0	0

Intersection: 1: Brant Street & Fairview Street

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	62.4	193.6	180.1	61.7
Average Queue (m)	49.0	120.5	105.0	27.6
95th Queue (m)	79.7	239.7	229.5	99.4
Link Distance (m)		224.1	224.1	
Upstream Blk Time (%)		12	5	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	55.0			90.0
Storage Blk Time (%)	3	41	21	0
Queuing Penalty (veh)	9	89	20	0

Intersection: 2: Brant Street & Grahams Lane/Prospect Street

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	35.7	14.0	24.4	33.6	21.5	58.8	66.2	27.4	276.7	288.2
Average Queue (m)	12.6	5.1	12.1	10.5	5.0	27.5	31.4	20.0	258.1	262.1
95th Queue (m)	28.6	13.1	22.9	24.0	15.6	52.4	57.5	38.1	293.9	311.3
Link Distance (m)		140.7		228.0		121.8	121.8		266.9	266.9
Upstream Blk Time (%)									14	26
Queuing Penalty (veh)									68	129
Storage Bay Dist (m)	40.0		20.0		20.0			20.0		
Storage Blk Time (%)	0		9	3	0	12		3	79	
Queuing Penalty (veh)	0		9	2	0	4		15	84	

Intersection: 3: Brant Street & Ghent Street

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	68.4	32.5	29.9	22.0	53.2	55.0	37.3	138.0	142.0
Average Queue (m)	37.5	7.9	12.2	6.4	25.2	27.1	6.8	129.5	127.1
95th Queue (m)	62.0	25.9	25.4	16.9	43.3	44.9	25.5	137.1	149.0
Link Distance (m)	163.0		152.7		67.2	67.2		121.8	121.8
Upstream Blk Time (%)					0	0		39	20
Queuing Penalty (veh)					0	0		221	114
Storage Bay Dist (m)		25.0		45.0			30.0		
Storage Blk Time (%)	22	0			1		0	46	
Queuing Penalty (veh)	6	0			0		0	10	

Intersection: 4: Brant Street & Olga Drive/Rambo Crescent

Movement	EB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	TR
Maximum Queue (m)	43.4	11.4	16.1	0.8	3.1	12.5	25.5
Average Queue (m)	17.2	2.5	3.9	0.0	0.1	2.0	1.3
95th Queue (m)	33.3	9.3	12.2	0.6	2.2	8.3	12.1
Link Distance (m)	93.5	41.8		40.4	40.4		77.0
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			20.0			15.0	
Storage Blk Time (%)			0			0	0
Queuing Penalty (veh)			1			2	0

Intersection: 5: Brant Street & South Driveway/Blairholm Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	R	T	TR	L	T
Maximum Queue (m)	60.2	15.0	21.6	41.3	70.9	65.3	22.2	65.7
Average Queue (m)	26.8	4.2	9.0	16.0	33.0	33.6	6.7	51.4
95th Queue (m)	53.5	12.2	21.0	31.0	58.8	59.2	18.2	74.5
Link Distance (m)	47.9	47.9		87.0	203.2	203.2		62.4
Upstream Blk Time (%)	2							4
Queuing Penalty (veh)	0							29
Storage Bay Dist (m)			15.0				15.0	
Storage Blk Time (%)			9	6			1	24
Queuing Penalty (veh)			12	2			5	12

Intersection: 6: Brant Street & Baldwin Street/Victoria Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (m)	21.9	24.5	15.1	31.3	19.3	96.3	38.8	66.1	49.1
Average Queue (m)	11.7	5.0	2.6	15.1	3.1	56.6	7.1	33.4	13.0
95th Queue (m)	21.7	16.1	9.7	27.0	11.6	95.0	21.1	58.8	33.0
Link Distance (m)		91.1		99.4		88.1		203.2	
Upstream Blk Time (%)						2			
Queuing Penalty (veh)						0			
Storage Bay Dist (m)	15.0		40.0		15.0		45.0		50.0
Storage Blk Time (%)	14	0		0	0	28		1	0
Queuing Penalty (veh)	5	0		0	2	3		3	0

Intersection: 7: Brant Street & North Driveway

Movement	NB	SB
Directions Served	L	TR
Maximum Queue (m)	10.5	42.8
Average Queue (m)	1.9	8.7
95th Queue (m)	8.0	32.0
Link Distance (m)		40.4
Upstream Blk Time (%)		1
Queuing Penalty (veh)		9
Storage Bay Dist (m)	15.0	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Network Summary

Network wide Queuing Penalty: 912

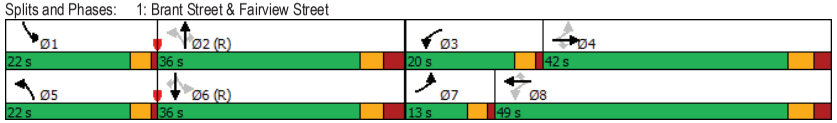
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	639	240	282	1160	357	313	806	218	248	710	194
Future Volume (vph)	240	639	240	282	1160	357	313	806	218	248	710	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		190.0	75.0		0.0	85.0		80.0	55.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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
Ped Bike Factor			0.98	1.00		0.96	0.99		0.92	0.99		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3471	1583	1752	3539	1553	1787	3574	1568	1752	3574	1568
Flt Permitted	0.111			0.225			0.137			0.135		
Satd. Flow (perm)	211	3471	1550	414	3539	1495	256	3574	1450	246	3574	1510
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			247			299			225			186
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		327.7			350.7			292.3			238.7	
Travel Time (s)		23.6			25.3			21.0			17.2	
Confl. Peds. (#/hr)	17		6	6		17	17		43	43		17
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	2%	3%	2%	4%	1%	1%	3%	3%	1%	3%
Adj. Flow (vph)	247	659	247	291	1196	368	323	831	225	256	732	200
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	659	247	291	1196	368	323	831	225	256	732	200
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes				
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	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%
Maximum Green (s)	9.0	35.6	35.6	16.0	42.6	42.6	18.0	29.5	29.5	18.0	29.5	29.5
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?												
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
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	47.5	36.1	36.1	57.9	42.5	42.5	51.4	31.3	31.3	48.4	29.6	29.6
Actuated g/C Ratio	0.40	0.30	0.30	0.48	0.35	0.35	0.43	0.26	0.26	0.40	0.25	0.25
v/c Ratio	1.22	0.63	0.39	0.78	0.96	0.51	0.95	0.89	0.41	0.84	0.83	0.39
Control Delay	162.1	39.6	5.8	35.9	54.9	9.0	70.0	56.3	7.1	52.2	52.3	8.9
Queue Delay	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 Delay	162.1	39.6	5.8	35.9	54.9	9.0	70.0	56.3	7.1	52.2	52.3	8.9
LOS	F	D	A	D	D	A	E	E	A	D	D	A
Approach Delay		58.6			42.8			51.5			45.0	
Approach LOS		E			D			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.22
Intersection Signal Delay: 48.7 Intersection LOS: D
Intersection Capacity Utilization 100.1% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 1: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	659	247	291	1196	368	323	831	225	256	732	200
v/c Ratio	1.22	0.63	0.39	0.78	0.96	0.51	0.95	0.89	0.41	0.84	0.83	0.39
Control Delay	162.1	39.6	5.8	35.9	54.9	9.0	70.0	56.3	7.1	52.2	52.3	8.9
Queue Delay	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 Delay	162.1	39.6	5.8	35.9	54.9	9.0	70.0	56.3	7.1	52.2	52.3	8.9
Queue Length 50th (m)	~57.8	74.5	0.0	43.4	150.8	11.5	61.9	107.0	0.0	43.5	91.0	2.7
Queue Length 95th (m)	#111.9	95.5	19.3	#70.5	#197.8	38.4	#121.4	#147.3	20.1	#83.8	115.0	22.1
Internal Link Dist (m)		303.7			326.7			268.3			214.7	
Turn Bay Length (m)			190.0	75.0			85.0		80.0	55.0		90.0
Base Capacity (vph)	203	1044	638	378	1256	723	339	931	544	328	880	512
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.63	0.39	0.77	0.95	0.51	0.95	0.89	0.41	0.78	0.83	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	639	240	282	1160	357	313	806	218	248	710	194
Future Volume (vph)	240	639	240	282	1160	357	313	806	218	248	710	194
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	0.96	1.00	1.00	0.92	1.00	1.00	0.96
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)	1805	3471	1550	1752	3539	1495	1786	3574	1450	1751	3574	1510
Flt Permitted	0.11	1.00	1.00	0.22	1.00	1.00	0.14	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	211	3471	1550	415	3539	1495	258	3574	1450	249	3574	1510
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	247	659	247	291	1196	368	323	831	225	256	732	200
RTOR Reduction (vph)	0	0	173	0	0	193	0	0	167	0	0	140
Lane Group Flow (vph)	247	659	74	291	1196	175	323	831	59	256	732	60
Confl. Peds. (#/hr)	17		6	6		17	17		43	43		17
Heavy Vehicles (%)	0%	4%	2%	3%	2%	4%	1%	1%	3%	3%	1%	3%
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)	45.1	36.1	36.1	55.5	42.5	42.5	49.2	31.2	31.2	46.0	29.6	29.6
Effective Green, g (s)	45.1	36.1	36.1	55.5	42.5	42.5	49.2	31.2	31.2	46.0	29.6	29.6
Actuated g/C Ratio	0.38	0.30	0.30	0.46	0.35	0.35	0.41	0.26	0.26	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)	198	1044	466	363	1253	529	334	929	377	300	881	372
v/s Ratio Prot	c0.09	0.19		c0.10	0.34		c0.14	0.23		0.12	0.20	
v/s Ratio Perm	c0.37		0.05	0.27		0.12	c0.25		0.04	0.21		0.04
v/c Ratio	1.25	0.63	0.16	0.80	0.95	0.33	0.97	0.89	0.16	0.85	0.83	0.16
Uniform Delay, d1	31.1	36.2	30.8	22.9	37.8	28.3	32.9	42.8	34.2	29.9	42.8	35.5
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	146.3	1.3	0.2	12.0	15.7	0.4	40.0	12.9	0.9	20.3	9.0	0.9
Delay (s)	177.3	37.5	31.0	34.9	53.5	28.7	72.9	55.7	35.1	50.1	51.8	36.4
Level of Service	F	D	C	C	D	C	E	E	D	D	D	D
Approach Delay (s)		66.0			45.7			56.4			48.9	
Approach LOS		E			D			E			D	

Intersection Summary				
HCM 2000 Control Delay	53.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	100.1%	ICU Level of Service	G	
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)	140	12	47	109	10	148	12	1049	63	199	1069	49
Future Volume (vph)	140	12	47	109	10	148	12	1049	63	199	1069	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		1.00	1.00	
Frt		0.881			0.860			0.992			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1644	0	1805	1588	0	1805	3499	0	1787	3538	0
Flt Permitted	0.616			0.716			0.170			0.172		
Satd. Flow (perm)	1151	1644	0	1347	1588	0	322	3499	0	322	3538	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50			157			10			8	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.9			245.1			144.7			292.3	
Travel Time (s)		11.2			17.6			10.4			21.0	
Confl. Peds. (#/hr)	8		10	10		8	9		25	25		9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	0%	2%	3%	1%	1%	5%
Adj. Flow (vph)	149	13	50	116	11	157	13	1116	67	212	1137	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	63	0	116	168	0	13	1183	0	212	1189	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		41.0	41.0		10.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	12.0	12.0		12.0	12.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	14.5	14.5		14.5	14.5		50.3	50.3		62.5	50.3	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.56	0.56		0.69	0.56	
v/c Ratio	0.81	0.21		0.54	0.43		0.07	0.60		0.59	0.60	
Control Delay	68.1	14.4		43.9	10.5		5.8	8.1		12.4	15.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.1	
Total Delay	68.1	14.4		43.9	10.5		5.8	8.1		12.4	15.3	
LOS	E	B		D	B		A	A		B	B	
Approach Delay		52.1			24.2			8.1			14.8	
Approach LOS		D			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 85 (94%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 83.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Brant Street & Grahams Lane/Prospect Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	149	63	116	168	13	1183	212	1189
v/c Ratio	0.81	0.21	0.54	0.43	0.07	0.60	0.59	0.60
Control Delay	68.1	14.4	43.9	10.5	5.8	8.1	12.4	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	68.1	14.4	43.9	10.5	5.8	8.1	12.4	15.3
Queue Length 50th (m)	25.9	2.0	19.2	1.7	0.6	31.7	10.7	74.6
Queue Length 95th (m)	#55.7	12.9	36.5	18.9	m1.2	35.7	21.2	96.3
Internal Link Dist (m)		130.9		221.1		120.7		268.3
Turn Bay Length (m)	40.0		20.0		20.0		20.0	
Base Capacity (vph)	204	333	239	411	179	1958	372	1979
Starvation Cap Reductn	0	0	0	0	0	60	0	0
Spillback Cap Reductn	0	1	0	0	0	0	0	81
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.19	0.49	0.41	0.07	0.62	0.57	0.63

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	12	47	109	10	148	12	1049	63	199	1069	49
Future Volume (vph)	140	12	47	109	10	148	12	1049	63	199	1069	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.86		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1775	1644		1787	1588		1802	3497		1786	3540	
Flt Permitted	0.62	1.00		0.72	1.00		0.17	1.00		0.17	1.00	
Satd. Flow (perm)	1151	1644		1347	1588		323	3497		323	3540	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	149	13	50	116	11	157	13	1116	67	212	1137	52
RTOR Reduction (vph)	0	42	0	0	132	0	0	4	0	0	4	0
Lane Group Flow (vph)	149	21	0	116	36	0	13	1179	0	212	1185	0
Confl. Peds. (#/hr)	8		10	10		8	9		25	25		9
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	0%	2%	3%	1%	1%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	14.5	14.5		14.5	14.5		50.2	50.2		58.5	50.2	
Effective Green, g (s)	14.5	14.5		14.5	14.5		50.2	50.2		58.5	50.2	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.56	0.56		0.65	0.56	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	264		217	255		180	1950		344	1974	
v/s Ratio Prot		0.01			0.02			0.34		c0.06	0.33	
v/s Ratio Perm	c0.13			0.09			0.04			c0.34		
v/c Ratio	0.81	0.08		0.53	0.14		0.07	0.60		0.62	0.60	
Uniform Delay, d1	36.4	32.1		34.7	32.4		9.2	13.3		8.3	13.2	
Progression Factor	1.00	1.00		1.00	1.00		0.46	0.49		1.00	1.00	
Incremental Delay, d2	21.9	0.1		2.5	0.3		0.7	1.2		3.3	1.4	
Delay (s)	58.3	32.2		37.2	32.7		4.9	7.8		11.6	14.6	
Level of Service	E	C		D	C		A	A		B	B	
Approach Delay (s)		50.5			34.5			7.8			14.1	
Approach LOS		D			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	83.6%	ICU Level of Service	E	
Analysis Period (min)	15			

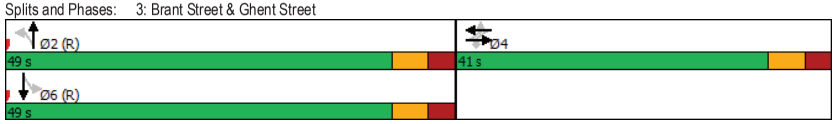
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	23	36	35	50	42	33	894	26	47	1183	205
Future Volume (vph)	227	23	36	35	50	42	33	894	26	47	1183	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		25.0	0.0		0.0	45.0		0.0	30.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		0.99			1.00		0.99	0.99	
Frt			0.850		0.956			0.996			0.978	
Flt Protected		0.957			0.986		0.950			0.950		
Satd. Flow (prot)	0	1818	1615	0	1781	0	1805	3554	0	1687	3473	0
Flt Permitted		0.679			0.804		0.099			0.242		
Satd. Flow (perm)	0	1286	1579	0	1450	0	188	3554	0	426	3473	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		31			4			29	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		177.0			166.8			87.4			144.7	
Travel Time (s)		12.7			12.0			6.3			10.4	
Confl. Peds. (#/hr)	5		12	12		5	20		29	29		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	7%	1%	0%
Adj. Flow (vph)	244	25	39	38	54	45	35	961	28	51	1272	220
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	269	39	0	137	0	35	989	0	51	1492	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		24.1	24.1		24.1		51.9	51.9		51.9	51.9	
Actuated g/C Ratio		0.27	0.27		0.27		0.58	0.58		0.58	0.58	
v/c Ratio		0.78	0.09		0.33		0.32	0.48		0.21	0.74	
Control Delay		45.5	5.3		20.6		21.0	10.8		9.8	11.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		45.5	5.3		20.6		21.0	10.8		9.8	11.5	
LOS		D	A		C		C	B		A	B	
Approach Delay		40.4			20.6			11.1			11.5	
Approach LOS		D			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.7		Intersection LOS: B	
Intersection Capacity Utilization 80.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Brant Street & Ghent Street



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	269	39	137	35	989	51	1492
v/c Ratio	0.78	0.09	0.33	0.32	0.48	0.21	0.74
Control Delay	45.5	5.3	20.6	21.0	10.8	9.8	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	5.3	20.6	21.0	10.8	9.8	11.5
Queue Length 50th (m)	45.2	0.0	15.2	1.5	22.8	2.7	42.7
Queue Length 95th (m)	64.6	5.3	26.7	10.8	101.8	m5.4	#175.1
Internal Link Dist (m)	153.0		142.8		63.4		120.7
Turn Bay Length (m)		25.0		45.0		30.0	
Base Capacity (vph)	485	626	567	108	2050	245	2014
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.06	0.24	0.32	0.48	0.21	0.74

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	23	36	35	50	42	33	894	26	47	1183	205
Future Volume (vph)	227	23	36	35	50	42	33	894	26	47	1183	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		0.99	1.00	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.98	
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1812	1579		1778		1801	3553		1669	3472	
Flt Permitted		0.68	1.00		0.80		0.10	1.00		0.24	1.00	
Satd. Flow (perm)		1286	1579		1449		188	3553		426	3472	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	244	25	39	38	54	45	35	961	28	51	1272	220
RTOR Reduction (vph)	0	0	29	0	23	0	0	2	0	0	12	0
Lane Group Flow (vph)	0	269	10	0	114	0	35	987	0	51	1480	0
Confl. Peds. (#/hr)	5		12	12		5	20		29	29		20
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	7%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Actuated Green, G (s)		24.1	24.1		24.1		51.9	51.9		51.9	51.9	
Effective Green, g (s)		24.1	24.1		24.1		51.9	51.9		51.9	51.9	
Actuated g/C Ratio		0.27	0.27		0.27		0.58	0.58		0.58	0.58	
Clearance Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		344	422		388		108	2048		245	2002	
v/s Ratio Prot								0.28			c0.43	
v/s Ratio Perm		c0.21	0.01		0.08		0.19			0.12		
v/c Ratio		0.78	0.02		0.29		0.32	0.48		0.21	0.74	
Uniform Delay, d1		30.5	24.3		26.2		9.9	11.2		9.2	14.1	
Progression Factor		1.00	1.00		1.00		0.82	0.80		0.63	0.55	
Incremental Delay, d2		11.0	0.0		0.4		7.6	0.8		1.7	2.2	
Delay (s)		41.5	24.3		26.6		15.8	9.7		7.5	10.0	
Level of Service		D	C		C		B	A		A	A	
Approach Delay (s)		39.3			26.6			9.9			9.9	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	80.2%	ICU Level of Service	D	
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)	20	2	23	0	0	8	36	971	1	30	1170	54
Future Volume (vph)	20	2	23	0	0	8	36	971	1	30	1170	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.931			0.865						0.993	
Flt Protected		0.978					0.950			0.950		
Satd. Flow (prot)	0	1695	0	0	1442	0	1805	3539	0	1805	1848	0
Flt Permitted		0.978					0.950			0.950		
Satd. Flow (perm)	0	1695	0	0	1442	0	1805	3539	0	1805	1848	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		104.9			57.0			58.9			95.8	
Travel Time (s)		7.6			4.1			4.2			6.9	
Confl. Peds. (#/hr)							14		30	30		14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	50%	0%	0%	0%	14%	0%	2%	0%	0%	2%	4%
Adj. Flow (vph)	22	2	25	0	0	9	39	1055	1	33	1272	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	49	0	0	9	0	39	1056	0	33	1331	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	2	23	0	0	8	36	971	1	30	1170	54
Future Volume (Veh/h)	20	2	23	0	0	8	36	971	1	30	1170	54
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	2	25	0	0	9	39	1055	1	33	1272	59
Pedestrians		14			30							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			3							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								136			183	
pX, platoon unblocked	0.47	0.47	0.43	0.47	0.47	0.93	0.43			0.93		
vC, conflicting volume	1996	2546	1316	2528	2574	558	1345			1086		
vC1, stage 1 conf vol	1382	1382		1164	1164							
vC2, stage 2 conf vol	614	1164		1364	1411							
vCu, unblocked vol	1998	3174	1073	3135	3236	374	1141			941		
tC, single (s)	7.5	7.5	6.9	7.5	6.5	7.2	4.1			4.1		
tC, 2 stage (s)	6.5	6.5		6.5	5.5							
tF (s)	3.5	4.5	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	71	97	73	100	100	98	85			95		
cM capacity (veh/h)	75	59	94	20	53	536	265			668		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	49	9	39	703	353	33	1331
Volume Left	22	0	39	0	0	33	0
Volume Right	25	9	0	0	1	0	59
cSH	82	536	265	1700	1700	668	1700
Volume to Capacity	0.59	0.02	0.15	0.41	0.21	0.05	0.78
Queue Length 95th (m)	21.4	0.4	4.1	0.0	0.0	1.2	0.0
Control Delay (s)	99.0	11.8	20.9	0.0	0.0	10.7	0.0
Lane LOS	F	B	C			B	
Approach Delay (s)	99.0	11.8	0.7			0.3	
Approach LOS	F	B					

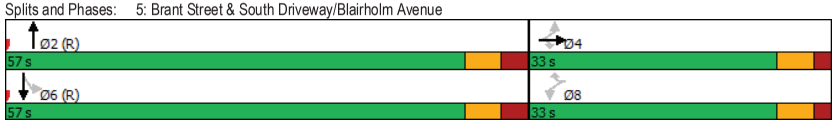
Intersection Summary							
Average Delay			2.4				
Intersection Capacity Utilization			80.9%		ICU Level of Service		D
Analysis Period (min)			15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	0	27	41	0	93	0	839	12	30	753	0
Future Volume (vph)	76	0	27	41	0	93	0	839	12	30	753	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	0		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.98	0.94	0.97		0.97						
Frt			0.850			0.850		0.998				
Flt Protected		0.950		0.950						0.950		
Satd. Flow (prot)	0	1703	1615	1703	0	1553	0	3499	0	1805	1845	0
Flt Permitted		0.950		0.705						0.315		
Satd. Flow (perm)	0	1671	1526	1223	0	1505	0	3499	0	598	1845	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48			98		3				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.3			100.7			228.8			77.4	
Travel Time (s)		4.3			7.3			16.5			5.6	
Confl. Peds. (#/hr)	14		16	16		14	13					13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	0%	0%	6%	0%	4%	0%	3%	0%	0%	3%	0%
Adj. Flow (vph)	80	0	28	43	0	98	0	883	13	32	793	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	80	28	43	0	98	0	896	0	32	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1		1		2		1	2	
Detector Template	Left	Thru	Right	Left		Right		Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0		2.0		10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0		2.0		0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	4	8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0		8.0		8.0		8.0	8.0	
Minimum Split (s)	26.0	26.0	26.0	26.0		26.0		40.5		40.5	40.5	
Total Split (s)	33.0	33.0	33.0	33.0		33.0		57.0		57.0	57.0	
Total Split (%)	36.7%	36.7%	36.7%	36.7%		36.7%		63.3%		63.3%	63.3%	
Maximum Green (s)	27.0	27.0	27.0	27.0		27.0		50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0		4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0		3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Recall Mode	None	None	None	None		None		C-Max		C-Max	C-Max	
Walk Time (s)	10.0	10.0	10.0	10.0		10.0		25.0		25.0	25.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0		10.0		8.0		8.0	8.0	
Pedestrian Calls (#/hr)	0	0	0	0		0		0		0	0	
Act Effct Green (s)		10.1	10.1	10.1		10.1		71.1		71.1	71.1	
Actuated g/C Ratio		0.11	0.11	0.11		0.11		0.79		0.79	0.79	
v/c Ratio		0.43	0.13	0.31		0.38		0.32		0.07	0.54	
Control Delay		43.7	6.1	42.0		12.3		5.9		8.7	13.2	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		43.7	6.1	42.0		12.3		5.9		8.7	13.2	
LOS		D	A	D		B		A		A	B	
Approach Delay		34.0			21.4			5.9			13.0	
Approach LOS		C			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 73 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Brant Street & South Driveway/Blairholm Avenue



Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	80	28	43	98	896	32	793
v/c Ratio	0.43	0.13	0.31	0.38	0.32	0.07	0.54
Control Delay	43.7	6.1	42.0	12.3	5.9	8.7	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.7	6.1	42.0	12.3	5.9	8.7	13.2
Queue Length 50th (m)	13.9	0.0	7.4	0.0	44.0	2.8	88.2
Queue Length 95th (m)	26.9	4.3	17.1	13.7	46.3	m4.9	138.7
Internal Link Dist (m)	35.3				204.8		53.4
Turn Bay Length (m)			15.0			15.0	
Base Capacity (vph)	501	491	366	520	2763	472	1456
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.06	0.12	0.19	0.32	0.07	0.54

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	0	27	41	0	93	0	839	12	30	753	0
Future Volume (vph)	76	0	27	41	0	93	0	839	12	30	753	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00	1.00		1.00		0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.94	1.00		0.97		1.00		1.00	1.00	
Flpb, ped/bikes		0.98	1.00	0.97		1.00		1.00		1.00	1.00	
Frt		1.00	0.85	1.00		0.85		1.00		1.00	1.00	
Flt Protected		0.95	1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1671	1526	1648		1505		3499		1805	1845	
Flt Permitted		0.95	1.00	0.70		1.00		1.00		0.31	1.00	
Satd. Flow (perm)		1671	1526	1223		1505		3499		598	1845	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	0	28	43	0	98	0	883	13	32	793	0
RTOR Reduction (vph)	0	0	25	0	0	89	0	1	0	0	0	0
Lane Group Flow (vph)	0	80	3	43	0	9	0	895	0	32	793	0
Confl. Peds. (#/hr)	14		16	16		14	13					13
Heavy Vehicles (%)	6%	0%	0%	6%	0%	4%	0%	3%	0%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4	8		8				6		
Actuated Green, G (s)		8.5	8.5	8.5		8.5		68.5		68.5	68.5	
Effective Green, g (s)		8.5	8.5	8.5		8.5		68.5		68.5	68.5	
Actuated g/C Ratio		0.09	0.09	0.09		0.09		0.76		0.76	0.76	
Clearance Time (s)		6.0	6.0	6.0		6.0		7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0	3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		157	144	115		142		2663		455	1404	
v/s Ratio Prot								0.26			c0.43	
v/s Ratio Perm		0.05	0.00	0.04		0.01				0.05		
v/c Ratio		0.51	0.02	0.37		0.07		0.34		0.07	0.56	
Uniform Delay, d1		38.8	37.0	38.3		37.1		3.5		2.7	4.5	
Progression Factor		1.00	1.00	1.00		1.00		1.48		2.22	2.25	
Incremental Delay, d2		2.6	0.1	2.0		0.2		0.3		0.2	1.2	
Delay (s)		41.4	37.0	40.3		37.3		5.4		6.2	11.3	
Level of Service		D	D	D		D		A		A	B	
Approach Delay (s)		40.2			38.2			5.4			11.1	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

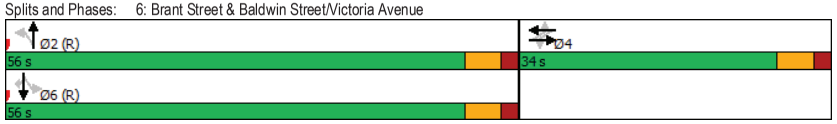
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	15	9	10	7	60	12	713	12	51	603	52
Future Volume (vph)	74	15	9	10	7	60	12	713	12	51	603	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	40.0		0.0	15.0		0.0	45.0		50.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. 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
Ped Bike Factor	0.98	0.98		0.96	0.97		0.97	1.00		0.98		0.88
Frt		0.942			0.866			0.998				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1707	0	1517	1460	0	1805	1748	0	1570	1727	1615
Flt Permitted	0.709			0.740			0.377			0.308		
Satd. Flow (perm)	1275	1707	0	1132	1460	0	694	1748	0	500	1727	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			65			2				57
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		105.7			113.2			98.7			228.8	
Travel Time (s)		9.5			10.2			7.1			16.5	
Confl. Peds. (#/hr)	16		24	24		16	79		64	64		79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	6%	19%	0%	11%	0%	8%	27%	15%	10%	0%
Adj. Flow (vph)	80	16	10	11	8	65	13	775	13	55	655	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	26	0	11	73	0	13	788	0	55	655	57
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Detector Phase	4	4		4	4		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	32.0	32.0		32.0	32.0		42.0	42.0		42.0	42.0	42.0
Total Split (s)	34.0	34.0		34.0	34.0		56.0	56.0		56.0	56.0	56.0
Total Split (%)	37.8%	37.8%		37.8%	37.8%		62.2%	62.2%		62.2%	62.2%	62.2%
Maximum Green (s)	28.0	28.0		28.0	28.0		50.0	50.0		50.0	50.0	50.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	25.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	11.4	11.4		11.4	11.4		70.6	70.6		70.6	70.6	70.6
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.78	0.78		0.78	0.78	0.78
v/c Ratio	0.50	0.12		0.08	0.30		0.02	0.57		0.14	0.48	0.05
Control Delay	46.3	24.9		33.6	14.1		4.2	7.8		7.5	8.0	3.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	46.3	24.9		33.6	14.1		4.2	7.8		7.5	8.0	3.5
LOS	D	C		C	B		A	A		A	A	A
Approach Delay		41.1			16.6			7.7			7.6	
Approach LOS		D			B			A			A	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 36 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 10.1 Intersection LOS: B
Intersection Capacity Utilization 68.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Brant Street & Baldwin Street/Victoria Avenue



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	80	26	11	73	13	788	55	655	57
v/c Ratio	0.50	0.12	0.08	0.30	0.02	0.57	0.14	0.48	0.05
Control Delay	46.3	24.9	33.6	14.1	4.2	7.8	7.5	8.0	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	24.9	33.6	14.1	4.2	7.8	7.5	8.0	3.5
Queue Length 50th (m)	13.9	2.6	1.8	1.3	0.5	54.1	2.4	29.6	0.4
Queue Length 95th (m)	26.9	9.6	6.4	12.9	2.4	107.6	m10.3	124.1	m6.0
Internal Link Dist (m)		81.7		89.2		74.7		204.8	
Turn Bay Length (m)	15.0		40.0		15.0		45.0		50.0
Base Capacity (vph)	396	537	352	499	544	1371	392	1354	1123
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.05	0.03	0.15	0.02	0.57	0.14	0.48	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	15	9	10	7	60	12	713	12	51	603	52
Future Volume (vph)	74	15	9	10	7	60	12	713	12	51	603	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	1.00		1.00	1.00	0.88
Flpb, ped/bikes	0.98	1.00		0.96	1.00		0.96	1.00		0.98	1.00	1.00
Frt	1.00	0.94		1.00	0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1708	1708		1454	1461		1736	1747		1532	1727	1417
Flt Permitted	0.71	1.00		0.74	1.00		0.38	1.00		0.31	1.00	1.00
Satd. Flow (perm)	1276	1708		1133	1461		688	1747		497	1727	1417
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)	80	16	10	11	8	65	13	775	13	55	655	57
RTOR Reduction (vph)	0	9	0	0	58	0	0	0	0	0	0	14
Lane Group Flow (vph)	80	17	0	11	15	0	13	788	0	55	655	43
Confl. Peds. (#/hr)	16		24	24		16	79		64	64		79
Heavy Vehicles (%)	4%	0%	6%	19%	0%	11%	0%	8%	27%	15%	10%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)	9.8	9.8		9.8	9.8		68.2	68.2		68.2	68.2	68.2
Effective Green, g (s)	9.8	9.8		9.8	9.8		68.2	68.2		68.2	68.2	68.2
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.76	0.76		0.76	0.76	0.76
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	138	185		123	159		521	1323		376	1308	1073
v/s Ratio Prot		0.01			0.01			c0.45			0.38	
v/s Ratio Perm	c0.06			0.01			0.02			0.11		0.03
v/c Ratio	0.58	0.09		0.09	0.09		0.02	0.60		0.15	0.50	0.04
Uniform Delay, d1	38.1	36.1		36.1	36.1		2.7	4.8		3.0	4.3	2.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.53	1.31	2.66
Incremental Delay, d2	5.8	0.2		0.3	0.3		0.1	2.0		0.7	1.2	0.1
Delay (s)	43.9	36.3		36.4	36.4		2.8	6.8		5.3	6.8	7.3
Level of Service	D	D		D	D		A	A		A	A	A
Approach Delay (s)		42.1			36.4			6.7			6.7	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	26	1000	772	95
Future Volume (vph)	0	0	26	1000	772	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	15.0			0.0
Storage Lanes	0	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt					0.985	
Flt Protected			0.950			
Satd. Flow (prot)	0	0	1770	3505	1819	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	1770	3505	1819	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.1			77.4	58.9	
Travel Time (s)	3.6			5.6	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	0	0	28	1087	839	103
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	28	1087	942	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	26	1000	772	95
Future Volume (Veh/h)	0	0	26	1000	772	95
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	28	1087	839	103
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				77	242	
pX, platoon unblocked	0.64	0.60	0.60			
vC, conflicting volume	1490	890	942			
vC1, stage 1 conf vol	890					
vC2, stage 2 conf vol	600					
vCu, unblocked vol	1022	489	574			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	95			
cM capacity (veh/h)	315	316	600			

Direction, Lane #	NB 1	NB 2	NB 3	SB 1
Volume Total	28	544	544	942
Volume Left	28	0	0	0
Volume Right	0	0	0	103
cSH	600	1700	1700	1700
Volume to Capacity	0.05	0.32	0.32	0.55
Queue Length 95th (m)	1.2	0.0	0.0	0.0
Control Delay (s)	11.3	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	0.3			0.0
Approach LOS				

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		49.7%	ICU Level of Service
Analysis Period (min)		15	

Intersection: 1: Brant Street & Fairview Street

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	323.7	327.5	319.0	58.8	82.4	341.8	335.9	321.2	92.5	185.5	185.9	87.5
Average Queue (m)	289.2	227.8	190.1	12.2	81.1	280.6	271.4	158.8	72.6	103.0	102.4	38.1
95th Queue (m)	378.8	425.5	390.8	44.0	92.1	414.0	409.1	413.6	111.4	182.0	174.3	105.8
Link Distance (m)	313.0	313.0	313.0			336.1	336.1	336.1		266.9	266.9	
Upstream Blk Time (%)	57	41	6			33	23	13				
Queuing Penalty (veh)	0	0	0			0	0	0				
Storage Bay Dist (m)				190.0	75.0				85.0			80.0
Storage Blk Time (%)			0		69	19			21	7	13	0
Queuing Penalty (veh)			0		401	54			83	22	28	1

Intersection: 1: Brant Street & Fairview Street

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	62.4	240.2	235.8	97.5
Average Queue (m)	59.7	214.0	206.9	69.4
95th Queue (m)	74.9	281.7	287.4	139.0
Link Distance (m)		224.1	224.1	
Upstream Blk Time (%)		68	38	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	55.0			90.0
Storage Blk Time (%)	19	73	60	0
Queuing Penalty (veh)	68	180	115	1

Intersection: 2: Brant Street & Grahams Lane/Prospect Street

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	47.3	104.5	27.4	97.2	23.1	67.1	65.0	27.4	278.5	287.0
Average Queue (m)	31.1	25.0	21.2	35.9	2.6	25.9	28.6	26.4	262.4	270.1
95th Queue (m)	51.1	79.8	32.0	85.4	11.3	49.4	52.8	33.6	294.6	314.8
Link Distance (m)		140.7		228.0		121.8	121.8		266.9	266.9
Upstream Blk Time (%)		1							14	24
Queuing Penalty (veh)		0							87	149
Storage Bay Dist (m)	40.0		20.0		20.0			20.0		
Storage Blk Time (%)	16	0	39	11	0	10		14	81	
Queuing Penalty (veh)	10	0	61	11	0	1		77	161	

Intersection: 3: Brant Street & Ghent Street

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	75.7	32.4	41.7	40.1	54.9	55.8	37.3	139.5	140.8
Average Queue (m)	37.4	8.7	17.8	14.7	20.3	23.0	12.7	129.2	127.6
95th Queue (m)	63.0	25.2	33.3	32.8	41.2	41.7	34.2	138.9	145.7
Link Distance (m)	163.0		152.7		67.2	67.2		121.8	121.8
Upstream Blk Time (%)					0	0		40	18
Queuing Penalty (veh)					0	0		243	111
Storage Bay Dist (m)		25.0		45.0			30.0		
Storage Blk Time (%)	22	0		0	0		0	46	
Queuing Penalty (veh)	8	0		2	0		0	22	

Intersection: 4: Brant Street & Olga Drive/Rambo Crescent

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	32.0	13.2	17.0	2.0	13.1	10.7
Average Queue (m)	12.0	2.2	4.7	0.1	3.3	0.8
95th Queue (m)	26.4	9.1	13.4	1.4	10.2	5.3
Link Distance (m)	93.5	41.8		40.4		77.0
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			20.0		15.0	
Storage Blk Time (%)			0		0	0
Queuing Penalty (veh)			1		3	0

Intersection: 5: Brant Street & South Driveway/Blairholm Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	R	T	TR	L	T
Maximum Queue (m)	41.2	15.6	21.1	36.5	68.3	61.0	22.2	64.6
Average Queue (m)	15.2	5.0	9.7	13.0	24.9	22.1	5.3	50.7
95th Queue (m)	29.5	12.8	19.4	26.1	51.9	46.0	17.0	76.2
Link Distance (m)	47.9	47.9		87.0	203.2	203.2		62.4
Upstream Blk Time (%)	0							3
Queuing Penalty (veh)	0							23
Storage Bay Dist (m)			15.0				15.0	
Storage Blk Time (%)			10	5			0	20
Queuing Penalty (veh)			9	2			1	6

Intersection: 6: Brant Street & Baldwin Street/Victoria Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (m)	21.9	34.0	14.9	25.6	14.2	99.3	48.5	120.7	47.8
Average Queue (m)	12.4	5.2	2.2	10.9	2.5	54.6	12.9	54.1	8.4
95th Queue (m)	22.3	20.0	9.4	22.1	9.9	101.0	32.9	99.8	33.3
Link Distance (m)		91.1		99.4		88.1		203.2	
Upstream Blk Time (%)						3			
Queuing Penalty (veh)						0			
Storage Bay Dist (m)	15.0		40.0		15.0		45.0		50.0
Storage Blk Time (%)	16	1			0	21		10	0
Queuing Penalty (veh)	4	0			1	3		10	0

Intersection: 7: Brant Street & North Driveway

Movement	NB	SB
Directions Served	L	TR
Maximum Queue (m)	11.2	43.8
Average Queue (m)	3.0	11.1
95th Queue (m)	10.2	35.5
Link Distance (m)		40.4
Upstream Blk Time (%)		1
Queuing Penalty (veh)		7
Storage Bay Dist (m)	15.0	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	1	

Network Summary

Network wide Queuing Penalty: 1970

Appendix J

Signal Warrant

Signal Justification Calculation for Existing Volumes (OTM Book 12 - Justification 7)

Horizon Year: 2027
Region/City/Township: Burlington

Major Street: Brant Street
Minor Street: Olga Drive/Rambo Cres
North/South: Y

Number of Approach Lanes: 1
Tee Intersection? N
Flow Conditions: Free

PM Forecast Only? N

Warrant Results		
150% Satisfied	**No**	Justification for new intersections with forecast traffic
120% Satisfied	**No**	Justification for existing intersections with forecast traffic

Time Period	Major Street						Minor Street						Peds Crossing Main Road
	Brant Street						Olga Drive/Rambo Cres						
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour	23	833	2	17	1202	12	30	3	53	3	0	9	0
PM Peak Hour	36	962	1	30	1161	54	20	2	23	0	0	8	0
verage Hourly Volur	**15**	**449**	**1**	**12**	**591**	**17**	**13**	**1**	**19**	**1**	**0**	**4**	**0**

Warrant 1 - Minimum Vehicular Volume

Warrant	AHV
1A - All	1121
1B - Minor	38
2A - Major	1083
2B - Cross	15

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	All Approaches	480	720	600	900	1121
					% Fulfilled	**233.5%**

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X	X			
	Minor Street Approaches	120	170	120	170	38
					% Fulfilled	**31.5%**

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Major Street Approaches	480	720	600	900	1083
					% Fulfilled	**225.7%**

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X	X			
	Traffic Crossing Major Street	50	75	120	170	15
					% Fulfilled	**29.0%**

Appendix K

Off-Site Parking Survey Data

Appendix C - Survey Data

City of Burlington Downtown Survey Data (April 6th - May 8th, 2021)

					Surveyed				
Address	Intensification Zone	LandUse	Date	Time (24 Hr)	Occupant (Observed)	Visitor (Observed)	Number of Units	Calculated Occupant Rate	Calculated Visitor Rate
442 Maple Ave	Primary	Apartment Building	Tues, April 6	8:00	146	5	135	1.08	0.04
442 Maple Ave	Primary	Apartment Building	Tues, April 6	9:00	148	5	135	1.10	0.04
442 Maple Ave	Primary	Apartment Building	Tues, April 6	10:00	148	6	135	1.10	0.04
505 Locust St	Primary	Apartment Building	Tues, April 6	8:30	101	0	117	0.86	
505 Locust St	Primary	Apartment Building	Tues, April 6	9:30	103	0	117	0.88	
505 Locust St	Primary	Apartment Building	Tues, April 6	10:30	103	0	117	0.88	
442 Maple Ave	Primary	Apartment Building	Thurs, April 8	8:00	143	8	135	1.06	0.06
442 Maple Ave	Primary	Apartment Building	Thurs, April 8	9:00	146	5	135	1.08	0.04
442 Maple Ave	Primary	Apartment Building	Thurs, April 8	10:00	145	5	135	1.07	0.04
505 Locust St	Primary	Apartment Building	Thurs, April 8	8:30	116	0	117	0.99	
505 Locust St	Primary	Apartment Building	Thurs, April 8	9:30	120	0	117	1.03	
505 Locust St	Primary	Apartment Building	Thurs, April 8	10:30	121	0	117	1.03	
505 Locust St	Primary	Apartment Building	Sat, April 17	8:30	100	0	117	0.85	
505 Locust St	Primary	Apartment Building	Sat, April 17	9:30	104	0	117	0.89	
505 Locust St	Primary	Apartment Building	Sat, April 17	10:30	107	0	117	0.91	
442 Maple Ave	Primary	Apartment Building	Sat, April 17	8:00	137	9	135	1.01	0.07
442 Maple Ave	Primary	Apartment Building	Sat, April 17	9:00	139	4	135	1.03	0.03
442 Maple Ave	Primary	Apartment Building	Sat, April 17	10:00	138	4	135	1.02	0.03
360 Pearl St	Primary	Apartment Building	Tues, April 27	8:00	87	0	75	1.16	
360 Pearl St	Primary	Apartment Building	Tues, April 27	9:00	93	0	75	1.24	
360 Pearl St	Primary	Apartment Building	Tues, April 27	10:00	94	0	75	1.25	
360 Pearl St	Primary	Apartment Building	Thurs, April 29	8:00	75	0	75	1.00	
360 Pearl St	Primary	Apartment Building	Thurs, April 29	9:00	78	0	75	1.04	
360 Pearl St	Primary	Apartment Building	Thurs, April 29	10:00	84	0	75	1.12	
2121 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	8:15	36	2	39	0.92	0.05
2121 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	9:15	39	1	39	1.00	0.03
2121 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	10:00	40	1	39	1.03	0.03
1477 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	9:00	61	0	60	1.02	
1477 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	9:45	63	0	60	1.05	
1477 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	10:30	63	0	60	1.05	
2121 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	8:00	42	1	39	1.08	0.03
2121 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	9:00	42	1	39	1.08	0.03

2121 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	10:00	45	0	39	1.15	0.00
1477 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	8:30	65	0	60	1.08	
1477 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	9:30	66	0	60	1.10	
1477 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	10:30	65	0	60	1.08	
2121 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	8:00	39	1	39	1.00	0.03
2121 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	9:00	41	0	39	1.05	0
2121 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	10:00	41	0	39	1.05	0
1477 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	8:30	64	0	60	1.07	
1477 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	9:30	63	0	60	1.05	
1477 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	10:30	64	0	60	1.07	
360 Pearl St	Primary	Apartment Building	Sat, May 8	8:00	69	0	75	0.92	
360 Pearl St	Primary	Apartment Building	Sat, May 8	9:00	77	0	75	1.03	
360 Pearl St	Primary	Apartment Building	Sat, May 8	10:00	78	0	75	1.04	

Parking Survey
Berkely Condominium
2025 Maria Street, Burlington ON
(154 Residential Units)

Time	Wednesday November 23, 2022		Thursday November 24, 2022		Friday November 25, 2022		Saturday November 26, 2022		Sunday November 27, 2022	
	Parking Demand		Parking Demand		Parking Demand		Parking Demand		Parking Demand	
	On-Site	Overall	On-Site	Overall	On-Site	Overall	On-Site	Overall	On-Site	Overall
12:00 AM	123	0.80	121	0.79	119	0.77	121	0.79	121	0.79
12:15 AM	123	0.80	121	0.79	119	0.77	122	0.79	121	0.79
12:30 AM	123	0.80	121	0.79	120	0.78	123	0.80	121	0.79
12:45 AM	123	0.80	121	0.79	120	0.78	123	0.80	121	0.79
1:00 AM	123	0.80	121	0.79	120	0.78	122	0.79	121	0.79
1:15 AM	123	0.80	121	0.79	120	0.78	122	0.79	122	0.79
1:30 AM	123	0.80	121	0.79	120	0.78	122	0.79	122	0.79
1:45 AM	123	0.80	121	0.79	120	0.78	123	0.80	122	0.79
2:00 AM	123	0.80	121	0.79	120	0.78	123	0.80	122	0.79
2:15 AM	123	0.80	121	0.79	120	0.78	123	0.80	122	0.79
2:30 AM	123	0.80	121	0.79	120	0.78	123	0.80	122	0.79
2:45 AM	123	0.80	121	0.79	120	0.78	123	0.80	122	0.79
3:00 AM	123	0.80	121	0.79	120	0.78	123	0.80	122	0.79
3:15 AM	123	0.80	121	0.79	120	0.78	123	0.80	122	0.79
3:30 AM	123	0.80	121	0.79	120	0.78	123	0.80	122	0.79
3:45 AM	123	0.80	121	0.79	120	0.78	123	0.80	122	0.79
4:00 AM	123	0.80	121	0.79	120	0.78	123	0.80	-	-
4:15 AM	123	0.80	121	0.79	120	0.78	123	0.80	-	-
4:30 AM	123	0.80	121	0.79	120	0.78	123	0.80	-	-
4:45 AM	123	0.80	120	0.78	120	0.78	123	0.80	-	-
5:00 AM	123	0.80	120	0.78	120	0.78	123	0.80	-	-
5:15 AM	123	0.80	120	0.78	120	0.78	123	0.80	-	-
5:30 AM	122	0.79	120	0.78	119	0.77	123	0.80	-	-
5:45 AM	122	0.79	120	0.78	118	0.77	123	0.80	-	-
6:00 AM	121	0.79	119	0.77	118	0.77	122	0.79	-	-
6:15 AM	121	0.79	119	0.77	117	0.76	122	0.79	-	-
6:30 AM	120	0.78	119	0.77	117	0.76	121	0.79	-	-
6:45 AM	119	0.77	118	0.77	116	0.75	120	0.78	-	-
7:00 AM	117	0.76	116	0.75	115	0.75	120	0.78	-	-
7:15 AM	114	0.74	111	0.72	112	0.73	120	0.78	-	-
7:30 AM	105	0.68	105	0.68	112	0.73	121	0.79	-	-
7:45 AM	103	0.67	103	0.67	107	0.69	122	0.79	-	-
8:00 AM	102	0.66	102	0.66	104	0.68	120	0.78	-	-
8:15 AM	96	0.62	97	0.63	101	0.66	117	0.76	-	-
8:30 AM	93	0.60	94	0.61	100	0.65	115	0.75	-	-
8:45 AM	90	0.58	94	0.61	96	0.62	116	0.75	-	-
9:00 AM	88	0.57	91	0.59	93	0.60	111	0.72	-	-
9:15 AM	87	0.56	89	0.58	91	0.59	109	0.71	-	-
9:30 AM	84	0.55	86	0.56	88	0.57	109	0.71	-	-
9:45 AM	80	0.52	85	0.55	82	0.53	107	0.69	-	-
10:00 AM	79	0.51	83	0.54	81	0.53	104	0.68	-	-
10:15 AM	77	0.50	80	0.52	83	0.54	99	0.64	-	-
10:30 AM	77	0.50	80	0.52	80	0.52	94	0.61	-	-
10:45 AM	74	0.48	79	0.51	81	0.53	91	0.59	-	-
11:00 AM	72	0.47	78	0.51	83	0.54	91	0.59	-	-
11:15 AM	69	0.45	75	0.49	81	0.53	86	0.56	-	-
11:30 AM	70	0.45	75	0.49	77	0.50	84	0.55	-	-
11:45 AM	71	0.46	74	0.48	75	0.49	82	0.53	-	-
12:00 PM	71	0.46	78	0.51	73	0.47	80	0.52	-	-
12:15 PM	73	0.47	79	0.51	71	0.46	80	0.52	-	-
12:30 PM	71	0.46	73	0.47	72	0.47	77	0.50	-	-
12:45 PM	72	0.47	72	0.47	70	0.45	77	0.50	-	-
1:00 PM	73	0.47	71	0.46	73	0.47	77	0.50	-	-
1:15 PM	72	0.47	71	0.46	77	0.50	78	0.51	-	-
1:30 PM	75	0.49	71	0.46	79	0.51	77	0.50	-	-
1:45 PM	74	0.48	71	0.46	84	0.55	75	0.49	-	-
2:00 PM	75	0.49	71	0.46	84	0.55	80	0.52	-	-
2:15 PM	73	0.47	74	0.48	88	0.57	83	0.54	-	-
2:30 PM	73	0.47	79	0.51	89	0.58	81	0.53	-	-
2:45 PM	72	0.47	79	0.51	89	0.58	81	0.53	-	-
3:00 PM	72	0.47	76	0.49	89	0.58	81	0.53	-	-
3:15 PM	72	0.47	77	0.50	88	0.57	85	0.55	-	-
3:30 PM	75	0.49	78	0.51	91	0.59	87	0.56	-	-
3:45 PM	76	0.49	77	0.50	91	0.59	87	0.56	-	-
4:00 PM	79	0.51	81	0.53	88	0.57	90	0.58	-	-
4:15 PM	82	0.53	83	0.54	88	0.57	95	0.62	-	-
4:30 PM	81	0.53	83	0.54	91	0.59	91	0.59	-	-
4:45 PM	85	0.55	86	0.56	94	0.61	93	0.60	-	-
5:00 PM	89	0.58	92	0.60	95	0.62	97	0.63	-	-
5:15 PM	89	0.58	96	0.62	97	0.63	99	0.64	-	-
5:30 PM	94	0.61	96	0.62	97	0.63	98	0.64	-	-
5:45 PM	100	0.65	96	0.62	98	0.64	100	0.65	-	-
6:00 PM	104	0.68	94	0.61	100	0.65	105	0.68	-	-
6:15 PM	104	0.68	92	0.60	100	0.65	106	0.69	-	-
6:30 PM	100	0.65	92	0.60	101	0.66	107	0.69	-	-
6:45 PM	102	0.66	93	0.60	103	0.67	106	0.69	-	-
7:00 PM	103	0.67	95	0.62	103	0.67	109	0.71	-	-
7:15 PM	103	0.67	96	0.62	106	0.69	109	0.71	-	-
7:30 PM	104	0.68	97	0.63	106	0.69	108	0.70	-	-
7:45 PM	104	0.68	98	0.64	108	0.70	109	0.71	-	-
8:00 PM	105	0.68	100	0.65	106	0.69	110	0.71	-	-
8:15 PM	107	0.69	100	0.65	108	0.70	110	0.71	-	-
8:30 PM	110	0.71	102	0.66	108	0.70	110	0.71	-	-
8:45 PM	110	0.71	103	0.67	109	0.71	111	0.72	-	-
9:00 PM	112	0.73	106	0.69	112	0.73	113	0.73	-	-
9:15 PM	113	0.73	110	0.71	114	0.74	114	0.74	-	-
9:30 PM	115	0.75	111	0.72	114	0.74	114	0.74	-	-
9:45 PM	116	0.75	111	0.72	117	0.76	115	0.75	-	-
10:00 PM	116	0.75	112	0.73	116	0.75	117	0.76	-	-
10:15 PM	117	0.76	112	0.73	117	0.76	117	0.76	-	-
10:30 PM	119	0.77	114	0.74	117	0.76	117	0.76	-	-
10:45 PM	119	0.77	115	0.75	117	0.76	119	0.77	-	-
11:00 PM	120	0.78	116	0.75	117	0.76	120	0.78	-	-
11:15 PM	120	0.78	118	0.77	120	0.78	120	0.78	-	-
11:30 PM	120	0.78	118	0.77	120	0.78	121	0.79	-	-
11:45 PM	120	0.78	118	0.77	120	0.78	121	0.79	-	-
Peak	**123**	**0.80**	**121**	**0.79**	**120**	**0.78**	**123**	**0.80**	**122**	**0.79**

Municipal Address:	**1284 Guelph Line**
	Burlington, ON L7L 4X5
Name:	**Mod'rn**
Type:	**Stacked Townhouse**
Units	**78**
Occupied	75
Parking Supply	**111**
Residents	83
Visitors	27
Car Share	1
Parking Supply Ratio	
Spaces/Unit	1.42
Resident spaces/unit	1.08
Visitor spaces/unit	0.35
Parking Rate (occupied)	
Day 1	
Visitor	0.17
Resident	0.69
Overall	**0.84**
Day 2	
Visitor	0.24
Resident	0.68
Overall	**0.92**

Wednesday - 13 April 2016				
Time	**Visitors**	**Residents**	**Car Share**	**Total**
16:00	11	13	1	25
16:15	9	17	1	27
16:30	11	15	1	27
16:45	13	17	1	31
17:00	12	19	1	32
17:15	10	20	1	31
17:30	7	25	1	33
17:45	9	29	1	39
18:00	9	32	1	42
18:15	10	35	1	46
18:30	9	38	1	48
18:45	13	39	1	53
19:00	12	42	1	55
19:15	10	45	1	56
19:30	12	45	1	58
19:45	10	44	1	55
20:00	13	43	1	57
20:15	13	42	1	56
20:30	12	44	1	57
20:45	12	46	1	59
21:00	**13**	47	1	61
21:15	12	49	1	62
21:30	11	50	1	62
21:45	11	**51**	1	63
22:00	12	50	**1**	**63**

Thursday - 14 April 2016				
Time	**Visitors**	**Residents**	**Car Share**	**Total**
16:00	7	14	1	**22**
16:15	7	19	1	**27**
16:30	5	19	1	**25**
16:45	5	19	1	**25**
17:00	4	18	1	**23**
17:15	4	20	1	**25**
17:30	5	23	1	**29**
17:45	7	23	1	**31**
18:00	8	25	1	**34**
18:15	8	28	1	**37**
18:30	9	31	1	**41**
18:45	9	34	1	**44**
19:00	9	36	1	**46**
19:15	8	35	1	**44**
19:30	10	36	1	**47**
19:45	10	39	1	**50**
20:00	10	41	1	**52**
20:15	11	42	1	**54**
20:30	12	42	1	**55**
20:45	15	44	1	**60**
21:00	14	47	1	**62**
21:15	16	48	1	**65**
21:30	17	50	1	**68**
21:45	18	50	1	**69**
22:00	**18**	**50**	**1**	**69**

NOTE: Car share is assumed to be related to the Resident demand only.

Municipal Address:	**1284 Guelph Line**
	Burlington, ON L7L 4X5
Name:	**Mod'rn**
Type:	**Stacked Townhouse**
Units	**78**
Occupied	70
Parking Supply	**111**
Residents	83
Visitors	27
Car Share	1
Parking Supply Ratio	
Spaces/Unit	1.42
Resident spaces/unit	1.08
Visitor spaces/unit	0.35
Parking Rate (occupied)	
Day 1 - 17 August 2016	
Visitor	0.10
Resident	0.87
Total	**0.96**
Day 2 - 23 April 2016	
Visitor	0.14
Resident	0.93
Total	**1.07**

Wednesday - 17 August 2016					
Time	**Visitors**	**Adj. Visitor**	**Residents**	**Car Share**	**Total**
16:00	8	2	26	1	**29**
16:15	10	4	27	1	**32**
16:30	12	5	30	1	**36**
16:45	10	3	28	1	**32**
17:00	9	2	29	1	**32**
17:15	8	1	33	1	**35**
17:30	8	1	34	1	**36**
17:45	8	1	34	1	**36**
18:00	9	1	46	1	**48**
18:15	9	2	46	1	**49**
18:30	10	2	46	1	**49**
18:45	10	2	46	1	**49**
19:00	13	4	47	1	**52**
19:15	13	4	48	1	**53**
19:30	11	2	43	1	**46**
19:45	11	2	44	1	**47**
20:00	12	2	47	1	**50**
20:15	13	3	49	1	**53**
20:30	16	6	50	1	**57**
20:45	16	6	55	1	**62**
21:00	16	6	56	1	**63**
21:15	17	7	56	1	**64**
21:30	17	7	57	1	**65**
21:45	17	**7**	58	1	**66**
22:00	16	6	**60**	**1**	**67**

NOTE: Car share is assumed to be related to the Resident demand only.

Tuesday - 23 August 2016					
Time	**Visitors**	**Adj. Visitor**	**Residents**	**Car Share**	**Total**
16:00	3	1	32	1	**34**
16:15	6	4	30	1	**35**
16:30	6	4	29	1	**34**
16:45	6	4	31	1	**36**
17:00	6	4	34	1	**39**
17:15	8	6	36	1	**43**
17:30	11	7	40	1	**48**
17:45	10	6	40	1	**47**
18:00	9	5	39	1	**45**
18:15	8	3	42	1	**46**
18:30	8	3	43	1	**47**
18:45	7	2	43	1	**46**
19:00	7	2	45	1	**48**
19:15	7	2	46	1	**49**
19:30	8	2	47	1	**50**
19:45	7	2	47	1	**50**
20:00	7	2	46	1	**49**
20:15	7	2	49	1	**52**
20:30	7	2	50	1	**53**
20:45	6	1	52	1	**54**
21:00	7	2	56	1	**59**
21:15	8	3	58	1	**62**
21:30	11	6	59	1	**66**
21:45	10	5	60	1	**66**
22:00	11	6	62	1	**69**
22:15	13	8	61	1	**70**
22:30	13	8	62	1	**71**
22:45	14	9	63	1	**73**
23:00	14	9	63	1	**73**
23:15	14	9	64	1	**74**
23:30	15	10	63	1	**74**
23:45	15	10	63	1	**74**
00:00	15	**10**	**64**	**1**	**75**

NOTE: Car share is assumed to be related to the Resident demand only.

4.4 Parking Utilization Surveys

To better understand of the actual parking demand that can be expected for a development of this type, a number of parking utilization surveys were undertaken by the City of Burlington at local sites with land uses similar to the development proposal for 374 Martha Street. The data collected at these proxy sites will be the best indicator of the parking demands expected at the proposed development as this is current and local data. The parking surveys are provided in **Appendix F** and the following sub-sections further describes the locations as well as the parking rates observed.

4.4.1 Millcroft Place (1998 Ironstone Drive, Burlington)

Millcroft Place is an eleven storey condominium building. Built in 2006, Millcroft Place has 134 two bedroom suites. Floor plans range between 1,196 and 1,482 square feet. Millcroft Place amenities include a party room with billiards, fitness room and hobby room. The parking utilization survey was carried out on a Saturday in November 2013.

The observed parking demand for the survey was calculated at 0.83 parking spaces per residential unit. Visitor parking was calculated at 0.07 parking spaces per residential unit.

4.4.2 Appleby Woods (1980 Imperial Way, Burlington)

Appleby Woods is a six storey condominium building. Built in 2009, Appleby Woods has 101 units with floor plans ranging from 977 up to 1,285 square feet. Appleby Woods amenities include a party room, fitness room, games room and library. The parking utilization survey was carried out on two separate Saturday's in November 2013.

The average observed parking demand for the survey days was calculated at 0.95 parking spaces per residential unit. The average visitor parking was calculated at 0.08 parking spaces per residential unit.

4.4.3 Strata (551 Maple Avenue, Burlington)

Strata is a twenty-one storey condominium building. Built in 2012, Strata has 186 units with floor plans ranging from 1 bedrooms up to 3 bedrooms. Strata amenities include indoor pool, hot tub, fitness room, party room, meditation garden and guest suites. The parking utilization survey was carried out on a Saturday in February 2014.

The observed parking demand for the survey day was calculated at 0.81 parking spaces per residential unit. The average visitor parking was calculated at 0.10 parking spaces per residential unit.

4.4.4 The Baxter (339 Elizabeth Street, Burlington)

The Baxter is a twelve storey condominium building. Built in 2006, the Baxter has 122 units with floor plans ranging from 1 bedrooms up to 2 bedrooms plus den. The Baxter amenities include fitness room, party room, billiards, BBQ area, hobby room and concierge services. The parking utilization survey was carried out on a Saturday in February 2014.

The observed parking demand for the survey day was calculated at 0.94 parking spaces per residential unit. No visitor parking rate was calculated for this location.

4.4.5 360 on Pearl (360 Pearl Street, Burlington)

360 on Pearl is a seventeen storey condominium building. Built in 2009, 360 on Pearl has 85 units with floor plans ranging from 1 bedrooms up to 2 bedrooms plus den. 360 on Pearl's amenities include fitness room, party room, billiards, rooftop terrace and theater. The parking utilization survey was carried out on a Saturday in February 2014.

The observed parking demand for the survey day was calculated at 0.75 parking spaces per residential unit. No visitor parking rate was calculated for this location.

4.4.6 Parking Utilization Survey Summary

The observed utilization data suggests that the apartment sites had a peak daily parking demand of 0.95 spaces per unit inclusive of resident and visitor parking as outlined in **Table 4.5**. The collected local survey data is noted to be greater than what ITE estimates for High-Rise Apartment in Urban Central Business Districts (0.45 spaces per unit) and less than what the City's Zoning By-Law requires (1.25 spaces per unit).

TABLE 4.5: OBSERVED DATA PEAK PARKING DEMAND

Data Set	Observed Parking/Unit	
	Residential	Visitor
Millcroft Place Survey 1	0.83	0.07
Appleby Woods Survey 1	0.93	0.05
Appleby Woods Survey 2	0.96	0.12
Strata Survey 1	0.81	0.10
The Baxter Survey 1	0.94	-
360 on Pearl Survey 1	0.75	-
Average Observed Rates	0.87	0.08

Parking Survey

Location: 5340 Lakeshore Road, Burlington

Survey Time: March 29th, 2017, 11:30 p.m.

Total Underground Residential Parking Supply:	60	spaces
Total Surface Residential Parking Supply:	3	spaces
Overall Residential Parking Supply:	63	spaces
Total number of Residential spaces occupied:	**45**	**spaces**
Total Visitor Parking Supply:	16	spaces
Total number of visitor spaces occupied:	**4**	**spaces**
Total number of dweling units occupied:	**42**	**units**
Residential Parking Rate:	1.07	residential spaces/dwelling unit
Visitor Parking Rate:	0.10	visitor spaces/dwelling unit

Appendix L

Occupant Parking Regression Analysis

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.940873666
R Square	0.885243256
Adjusted R Square	0.872492507
Standard Error	17.05117551
Observations	11

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	20185.31672	20185.31672	69.42676335	1.5968E-05
Residual	9	2616.683275	290.7425862		
Total	10	22802			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-11.54300292	14.56445733	-0.792546035	0.448428813	-44.4900944	21.40408857	-44.4900944	21.40408857
X Variable 1	1.166174633	0.139958774	8.3322724	1.5968E-05	0.849565889	1.482783377	0.849565889	1.482783377

RESIDUAL OUTPUT

Observation	*Predicted Y*	*Residuals*
1	40.93485557	1.065144425
2	161.0508428	-26.05084279
3	129.5641277	-12.56412769
4	98.0774126	-23.0774126
5	65.42452287	-5.42452287
6	40.93485557	-1.934855575
7	64.25834824	13.74165176
8	101.5759365	-0.575936497
9	169.2140652	16.78593478
10	119.068556	15.93144401
11	131.896477	22.10352304

