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401-417 Martha Street Transportation Studies

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March 2020
200116

Project Summary

401-417 Martha Street Transportation Studies

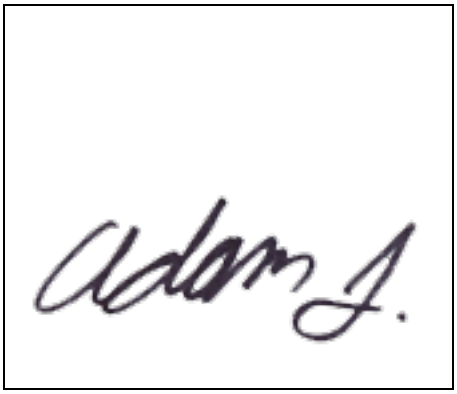
Project Number
200116

March 2020

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study (TIS), Parking Study (PS) and TDM Options Report for the proposed redevelopment of the lands known municipally as 401-417 Martha Street in the City of Burlington, Ontario.

The study includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts, parking demand analysis, and outlines recommendations to improve future traffic conditions and strategies to reduce dependency on single occupancy vehicle travel.

Conclusions

Transportation

The study evaluated existing conditions, the impacts of background traffic growth and projected the impacts of the development with the construction of 130 residential units.

Vehicular access to the site is proposed via one all movements driveway connection to Martha Street, located approximately 175 metres north of the intersection of Lakeshore Road and Martha Street (centreline to centreline). Full build-out of the development is projected to generate 40 new trips during the AM peak hour and 43 new vehicle trips during the PM peak hour.

Detailed traffic analysis was conducted for each of the study area intersections under 2020 base conditions and 2027 background and total conditions. The traffic analysis conducted as part of this assessment indicates that development volumes will only result in minor increases to the surrounding study area intersection volumes under peak conditions which should not be perceptible. It is acknowledged that capacity constraints at the Lakeshore Road and Brant Street in intersection is presently occurring and are expected to further deteriorate with anticipated growth in traffic, independent of the proposed development. To address these deficiencies the following mitigation measures are recommended to be implemented by the City:

- **Lakeshore Road at Brant Street:** The City's transportation system will need to provide capacity through a combination of measures to encourage alternative modes of transportation, including active transportation and TDM and increased transit

usage to provide for a better balance of mode choice for the overall transportation network. Until this occurs, an interim improvement option could be to optimize the intersection signal timings with an increased cycle length. A sensitivity analysis has been undertaken for the Total traffic conditions and indicates the intersection would operate with improved operations.

A left turn lane warrant analysis was conducted along Martha Street at the Site Driveway and found that a left-turn lane is not warranted to service development traffic.

Parking

The results of the methodologies used in the parking analysis provide a general understanding of parking behaviour. The parking analysis conducted indicates that the proposed supply of 1.23 parking spaces per unit (160 parking spaces) meets the City's ZBL requirements. However, the proposed visitor parking supply of 0.05 spaces per unit is not met.

The impact to the publicly available parking supply is expected to be minimal as up to 26 off-site parking spaces could be utilized for visitor use. As the area is well served, from a transit perspective, and permanent public parking facilities are in the area, justification for a reduced visitor requirement should be granted. As the primary purpose of off-site public parking facilities is to provide short-stay parking for visitors to the area, the use of these spaces for visitors of the development will not have a negative impact on the surrounding neighborhood.

Furthermore, as a surplus of parking supply is proposed for the residential component, (i.e. exceeding the requirements under the ZBL), 26 of these spaces could technically be assigned for visitor use. To accommodate this, access control equipment for the parking garage would need to be relocated to parking level one to create additional visitor spaces within a "nested" area while still providing a gated area for residential parking. This is not seen as a requirement at this time based on the analysis contained herein, however is one potential option to create additional visitor spaces on-site that would meet the ZBL requirements.

Overall, as the City recognizes parking management as a tool to influence mode choice, the provision of the reduced visitor requirements will further encourage non-automotive modes of travel.

Transportation Demand Management (TDM)

To further promote the site as a sustainable development a variety of transportation demand management measures (TDM) to reduce parking demand is recommended to be incorporated. The TDM plan will focus on making the site a model of sustainable transportation by promoting alternative modes of transportation over the use of private automobiles. The plan calls for implementation of a comprehensive suite of strategies aimed at reducing the need for vehicle ownership.

Recommendations

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

- The proposed Site Driveway operate with a single inbound and outbound travel lane with stop control provided for the east leg;
- The City of Burlington support the proposed parking supply of 160 residential parking spaces (1.23 spaces per unit) and 7 visitor parking spaces(0.05 parking spaces per unit); and
- To promote alternative modes of transportation and further reduce the risk attached to reduced parking ratios, the owner develop and implement a TDM plan.

Contents

1 Introduction 1

1.1 Overview 1
1.2 Purpose and Scope 3
1.3 Study Area 3

2 Existing Conditions 4

2.1 Existing Road Network 4
2.2 Existing Transit Service 7
2.2.1 Burlington Transit 7
2.2.2 GO Transit Service 8
2.3 Active Transportation 10
2.3.1 Walking 10
2.3.2 Cycling 10
2.4 Existing Traffic Volumes 12
2.4.1 Traffic Data 12
2.4.2 Base Year Adjustments 13
2.4.3 Volume Balancing 13
2.5 Existing Traffic Operations 16

3 Development Concept 21

3.1 Site Description 21
3.2 Trip Generation 23
3.2.1 Institute of Transportation Engineers (ITE) 23
3.2.2 Modal Split 23
3.2.3 Net Trip Generation Estimates 24
3.3 Development Trip Distribution and Assignment 25
3.3.1 Trip Distribution 25
3.3.2 Assignment 25

4 Future Traffic 28

4.1 Background Growth 28
4.1.1 General Growth 28
4.1.2 Other Area Developments 28
4.2 Background Traffic Forecasts 31
4.3 Total Traffic Forecasts 31

5 Analysis 36

5.1 Background Traffic Capacity Analysis 36
5.2 Total Traffic Capacity Analysis 40
5.3 Site Distance Evaluation 44

6 Remedial Measures 46

6.1 Brant Street and Lakeshore Road 46

6.2 Martha Street and Site Driveway 48

7 Parking Assessment 49

7.1 Zoning By-Law Requirements 49
7.2 Visitor Parking Supply 50
7.2.1 2011 Downtown Parking Study 52
7.2.2 2015 Downtown Limited Survey 52
7.2.3 Other Jurisdictions 54
7.3 Bicycle Parking 54
7.4 Summary of Parking Demand 55

8 Transportation Demand Management 57

8.1 Commitment 58
8.1.1 Factors for Success 58
8.1.2 Approach 58
8.2 Multimodal Infrastructure 59
8.2.1 Walking 59
8.2.2 Cycling 59
8.2.3 Secure Bicycle Parking 60
8.2.4 Transit 60
8.3 Management and Marketing 61
8.3.1 TDM Coordinator 61
8.3.2 Transportation Information 61
8.3.3 Ride Share 61
8.4 Site Specific Strategies 63
8.4.1 On-Site Bicycle Repair Facilities 63
8.4.2 Car Sharing Program 63
8.5 Parking Management 64
8.5.1 Parking Supply 64
8.5.2 Unbundled Parking for Residents 64
8.6 TDM Summary 65

9 Conclusions and Recommendations 67

9.1 Conclusions 67
9.2 Recommendations 69

Appendices

Appendix A Terms of Reference
Appendix B Turning Movement Count Data and Signal Timings
Appendix C Base Year Traffic Operations Reports
Appendix D Trip Distribution Calculations
Appendix E In-Stream Development Traffic Forecasts
Appendix F 2027 Background Traffic Operations Reports
Appendix G 2027 Total Traffic Operations Reports
Appendix H Sensitivity Analysis Operations Reports
Appendix I Left-Turn Lane Warrant Nomographs
Appendix J Zoning By-Law 2020
Appendix K Off-Site Parking Survey Data

Figures

Figure 1.1: Location of Subject Site City of Burlington 2
Figure 2.1: Existing Lane Configurations and Traffic Control 6
Figure 2.2: Existing Transit Services 9
Figure 2.3: Existing Cycling Facilities 11
Figure 2.4A: Adjusted Base Year Traffic Volumes – AM Peak Hour 14
Figure 2.4B: Adjusted Base Year Traffic Volumes – PM Peak Hour 15
Figure 3.1: Proposed Site Plan 22
Figure 3.2A: Site Generated Traffic Forecasts – AM Peak Hour .. 26
Figure 3.2B: Site Generated Forecasts – PM Peak Hour 27
Figure 4.1: Approved and In-Stream Developments 29
Figure 4.2A: 2027 Background Traffic Forecasts – AM Peak Hour 32
Figure 4.2B: 2027 Background Traffic Forecasts – PM Peak Hour 33
Figure 4.3A: 2027 Total Traffic Forecasts – AM Peak Hour 34
Figure 4.3B: 2027 Traffic Forecasts – PM Peak Hour 35
Figure 7.1: Local Area Public Parking Facilities 51

Tables

Table 2.1:	Traffic Data	12
Table 2.2:	Vehicle Level of Service Definitions	16
Table 2.3A:	Base Year Operations – AM Peak Hour	19
Table 2.3B:	Base Year Operations – PM Peak Hour	20
Table 3.1:	2016 TTS Mode of Travel	24
Table 3.2:	Development Trip Generation Summary	24
Table 3.3:	Trip Distribution	25
Table 4.1:	Approved or In-Stream Developments	30
Table 5.1A:	2027 Background Operations – AM Peak Hour	38
Table 5.1B:	2027 Background Operations – PM Peak Hour	39
Table 5.2A:	2027 Total Operations – AM Peak Hour	42
Table 5.2B:	2027 Total Operations – PM Peak Hour	43
Table 5.3:	Sight Distance Requirements	45
Table 6.1:	Sensitivity Analysis	47
Table 7.1:	Zoning By-Law Requirements	49
Table 7.2:	Other Jurisdiction Parking Rates	54

1 Introduction

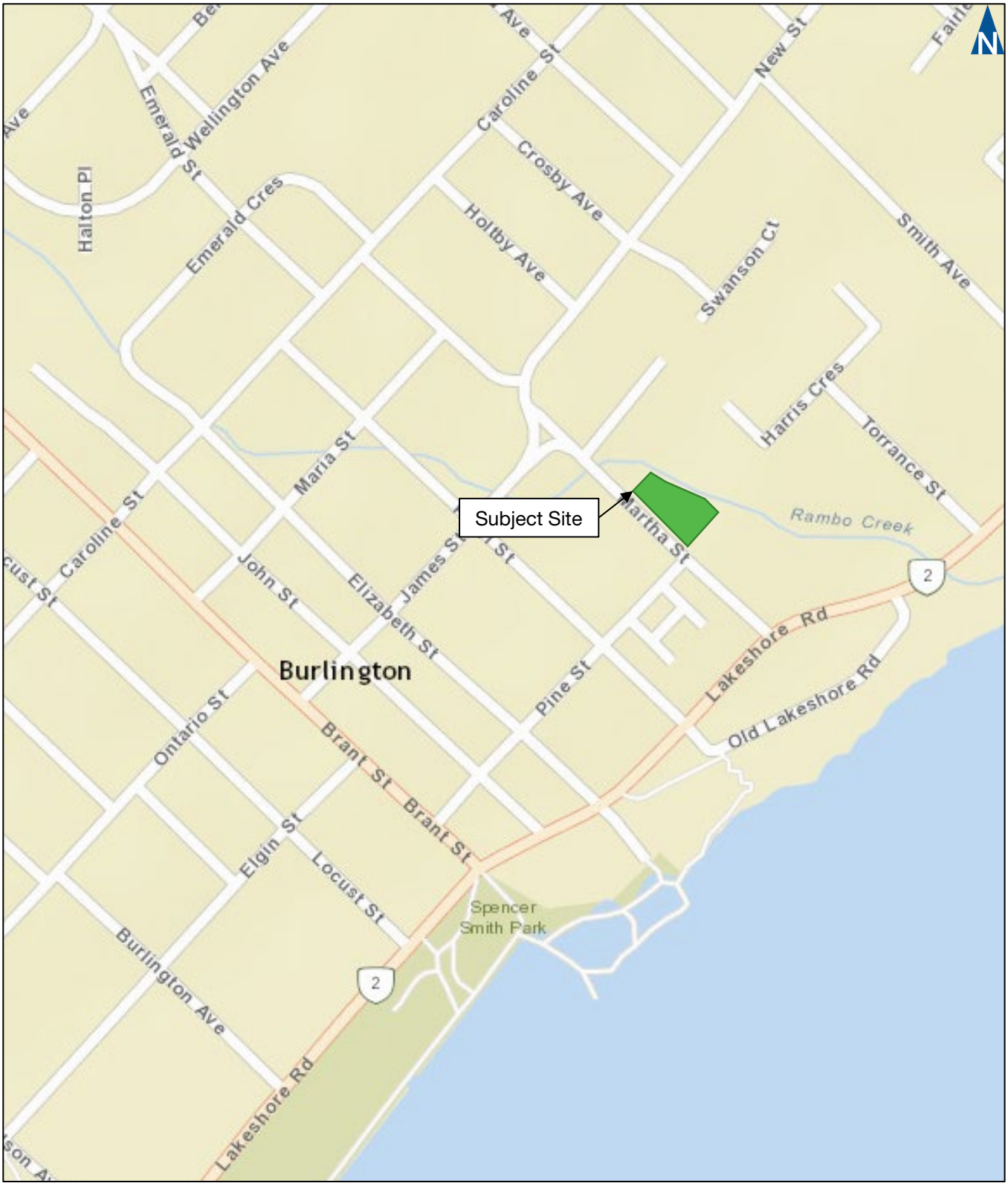
1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study, Parking Study and TDM Options Report for the proposed redevelopment of the lands known municipally as 401-417 Martha Street in the City of Burlington.

The subject site is proposed to be redeveloped to include a 11-storey building that will include 130 residential units. Vehicular access to the site is proposed via one all movements driveway connection to Martha Street. The site's parking demand is proposed to be accommodated by an underground parking structure containing 167 parking stalls among four floors.

Pre-study consultation was undertaken via e-mail, with the City of Burlington in September 2017 with supplemental correspondence completed in March 2020. **Appendix A** contains the pre-study correspondence and comments received from City staff.

Figure 1.1 illustrates the location of the development.



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Location of Subject Site
City of Burlington

1.2 Purpose and Scope

The purpose of this study is to determine the impacts of the development traffic on the surrounding road network and identify any improvements necessary to accommodate the increase in traffic generated by this development. The scope of this study is to:

- document current traffic and site conditions in the vicinity of the development;
- estimate the background traffic growth in the area;
- estimate development site traffic;
- assign development traffic to the surrounding road network;
- assess future total traffic within the study area for a horizon year five (5) years from built-out of the site;
- identify any operational or safety concerns and any mitigation measures that may be required to improve operations;
- review the City of Burlington's Zoning By-Law requirements;
- provide a technical analysis using secondary source and local parking survey information to estimate the potential parking demand;
- review the adequacy of the proposed parking supply; and
- review and identify potential Transportation Demand Management (TDM) measures that can be implemented for the proposed development.

1.3 Study Area

The intersections evaluated within this study that are most likely to be impacted by the development, as identified by the City are:

1. Lakeshore Road and Brant Street (signalized)
2. Lakeshore Road and Elizabeth Street (signalized)
3. Lakeshore Road and Pearl Street (signalized)
4. Lakeshore Road and Martha Street (unsignalized)
5. Martha Street and Pine Street (unsignalized)
6. James Street and Martha Street (unsignalized)
7. Pine Street and Pearl Street (unsignalized)
8. New Street and Martha Street (signalized)

2 Existing Conditions

This section of the report provides an overview of the existing conditions on the roadways in the study area.

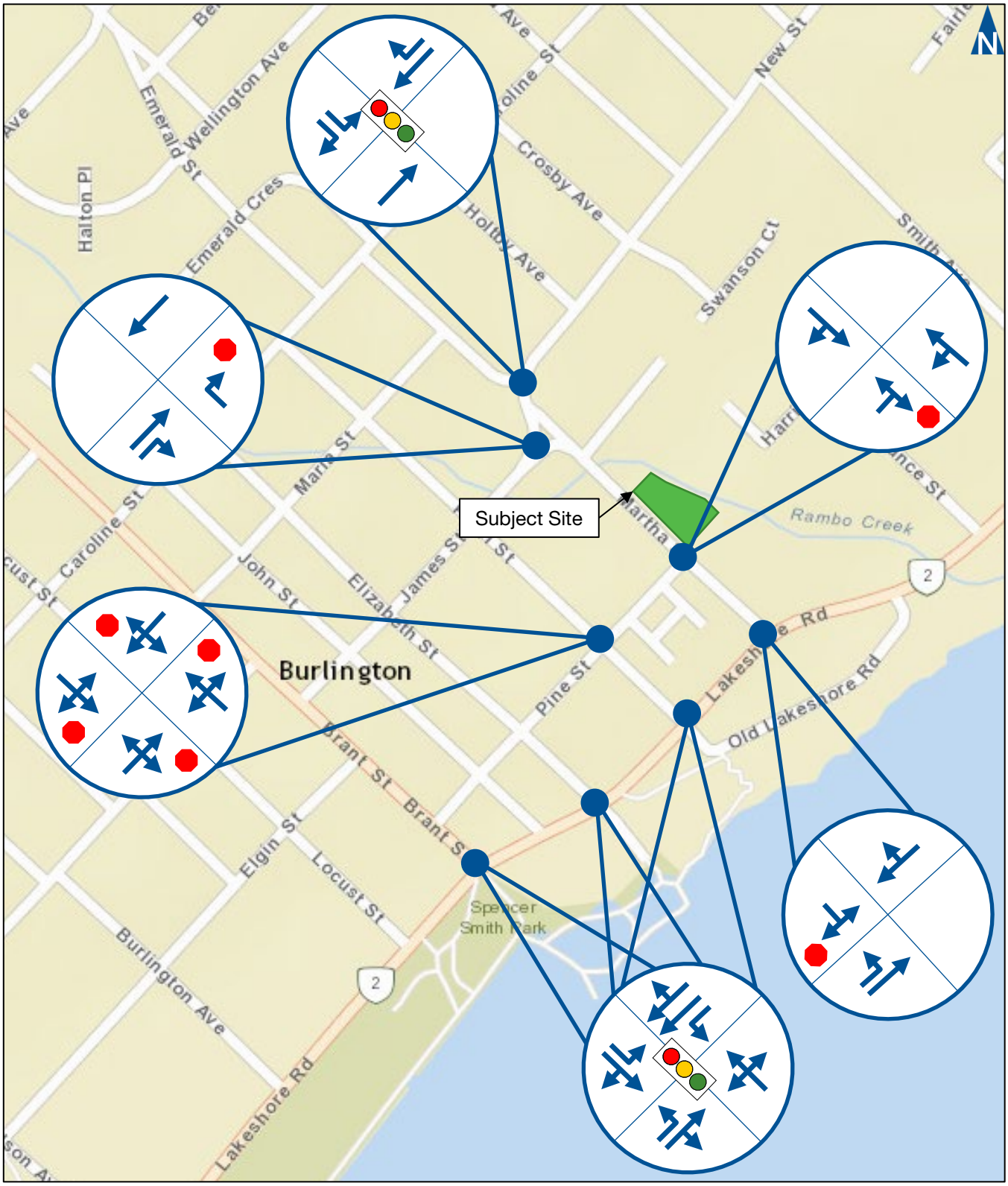
2.1 Existing Road Network

The main roadways in the vicinity of the subject site that have been assessed include Brant Street, James Street, Lakeshore Road, Elgin Street, Caroline Street, Elizabeth Street, John Street and Ontario Street. The characteristics of these roadways are as follows:

- Brant Street is a north-south two-lane minor arterial roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, on-street parking and sidewalks on both sides. The maximum speed limit is unposted and assumed to be 50 kilometres per hour.
- James Street/New Street is an east-west two-lane minor arterial roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, on-street parking provided on the south side, and sidewalks provided on both sides of the roadway. The maximum speed limit is unposted and assumed to be 50 kilometres per hour.
- Lakeshore Road is an east-west two-lane minor arterial roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, sidewalks and no stopping restrictions on both sides of the roadway. The maximum posted speed limit is 50 kilometres per hour.
- Elizabeth Street is a north-south two-lane collector roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, sidewalks on both sides, on-street parking on the west side, and no stopping restrictions on the east side. The maximum posted speed limit is unposted and assumed to be 50 kilometres per hour.
- Martha Street is a north-south two-lane collector roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, on-street parking and sidewalks on both sides. The speed limit is unposted and assumed to be 50 kilometres per hour.
- Pearl Street is a north-south two-lane collector roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, on-street parking and sidewalks on both sides. The speed limit is unposted and assumed to be 50 kilometres per hour.

- Pine Street is an east-west two-lane collector roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, on-street parking and sidewalks on both sides. The speed limit is unposted and assumed to be 50 kilometres per hour.

Figure 2.1 illustrates the existing lane configurations and traffic control at the study area intersections.



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Existing Lane Configurations and Traffic Control

2.2 Existing Transit Service

2.2.1 Burlington Transit

Burlington Transit (BT) is the public transit operator for the City of Burlington and operates several routes within the study area. The main bus terminal in Downtown Burlington (Downtown Mobility Hub) is located on John Street, approximately a 400-metre walk from the subject site.

Currently, BT operates six routes within the study area:

- Route 3,3x (Guelph-Downtown) runs between the Burlington GO Station and the Highway 407 Carpool Lot via Downtown Burlington. The route runs with approximately 20-minute headways during weekday peak hours, and 30-minute headways during other service hours.
- Route 4 (Central) runs between Downtown Burlington and the Appleby GO Station. The route runs with approximately 45-minute headways during the weekday afternoon peak hour, and other service times. No service is provided during the AM peak hour.
- Route 5 (Francis-Downtown) operates between King/Townsend and the Burlington GO Station via Downtown Burlington. The route runs with 30-minute headways during all weekday service hours.
- Route 10 (New-Maple) runs between Burlington GO Station and Appleby GO Station via Downtown Burlington. The route operates with approximately 20-minute headways during weekday peaks and 30-minute headways during all other weekday service hours.
- Route 50 (Burlington South) provides late night service around the southern portion of the City emanating and terminating at the Burlington GO Station. Buses operate with one-hour headways and provide a connection at the John Street Transit Terminal. The service runs between 10:55 PM and 1:07 AM, Monday to Saturday.
- Route 52 (Burlington Northwest) provides late night service around the northwest portion of the City emanating and terminating at the Burlington GO Station. Buses operate with one-hour headways and stop in Downtown Burlington. The service runs between 10:55 PM and 1:13 AM, Monday to Saturday.

2.2.2 GO Transit Service

The Burlington GO station is located about two kilometres north of the subject site which is easily accessible via Burlington Transit. Since this GO line provides train service to Mississauga, Downtown Toronto and other parts of the GTA, it is expected that the subject development will attract residents that will utilize both City transit and inter-regional transit for commuting purposes.

Figure 2.2 illustrates the existing transit network**.**



NTS
Image Source: burlingtontransit.com

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Existing Transit Services

2.3 Active Transportation

2.3.1 Walking

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

The site is located within walking distance of numerous and 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.

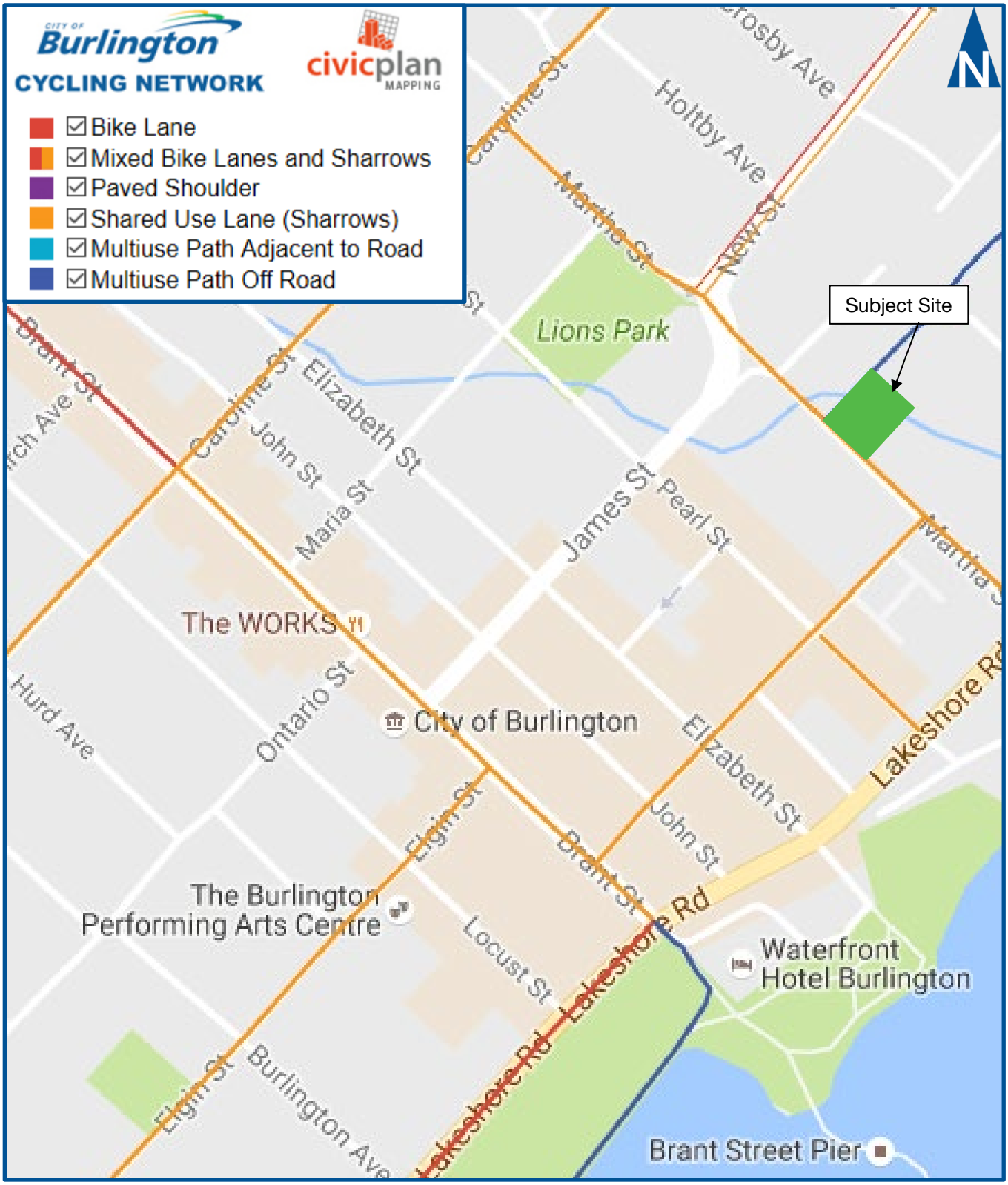
Walk Score is an online tool that assigns a numerical walkability score between 0 and 100 for addresses in Australia, Canada, United States, and New Zealand. Walk Score ranks communities nationwide based on how many businesses, parks, theatres, schools and other common destinations are within walking distance of any given address. The subject site is noted to have a Walk Score of 88 and is considered a "Very Walkable" location which means most daily errands can be accomplished on foot without the need of a personal vehicle[1].

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 2016 Cycling Map[2] identifies several facilities within the study area. Brant Street, Martha Street, Pine Street and Pearl Street are designated as "signed routes" and operate with shared use lane markings and signage (sharrows). Lakeshore Road has a bike lane from Brant Street west to Maple Avenue. A review of the City's Cycling Master Plan[3] has identified Brant Street and Caroline Street as proposed Bicycle Priority Streets. Additionally, bike lanes are proposed on Elgin Street and Lakeshore Road east of Brant Street. **Figure 2.3** illustrates the existing cycling facilities within the study area.

[1] https://www.walkscore.com/score/401-martha-st-burlington-on-canada
[2] City of Burlington: Cycling Network. Civic Plan Mapping, 2016.
[3] City of Burlington: Draft Cycling Master Plan. August 2019.



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Existing Cycling Facilities

2.4 Existing Traffic Volumes

To assess intersection operations, turning movement counts are used to quantify the movement of vehicles. Existing traffic data at an intersection or on a road section forms the foundation for analysis. The counts are usually taken during peak periods at an intersection to complete level of service analysis. **Appendix B** contains the traffic data utilized in this report.

2.4.1 Traffic Data

Turning movement volumes for the weekday peak hours were conducted by Paradigm. **Table 2.1** outlines the counts obtained at each intersection.

TABLE 2.1: TRAFFIC DATA

Intersection	Date	Season	Conducted by
Brant Street at Lakeshore Road	April 2018	Spring	City
Lakeshore Road at Elizabeth Street	February 2020	Winter	Paradigm
Lakeshore Road at Pearl Street	November 2018	Winter	Paradigm
Lakeshore Road at Martha Street	February 2020	Winter	Paradigm
Pine Street at Martha Street	February 2020	Winter	Paradigm
James Street at Martha Street	June 2018	Spring	Paradigm
Pine Street at Pearl Street	February 2020	Winter	Paradigm
New Street at Martha Street	June 2018	Spring	Paradigm

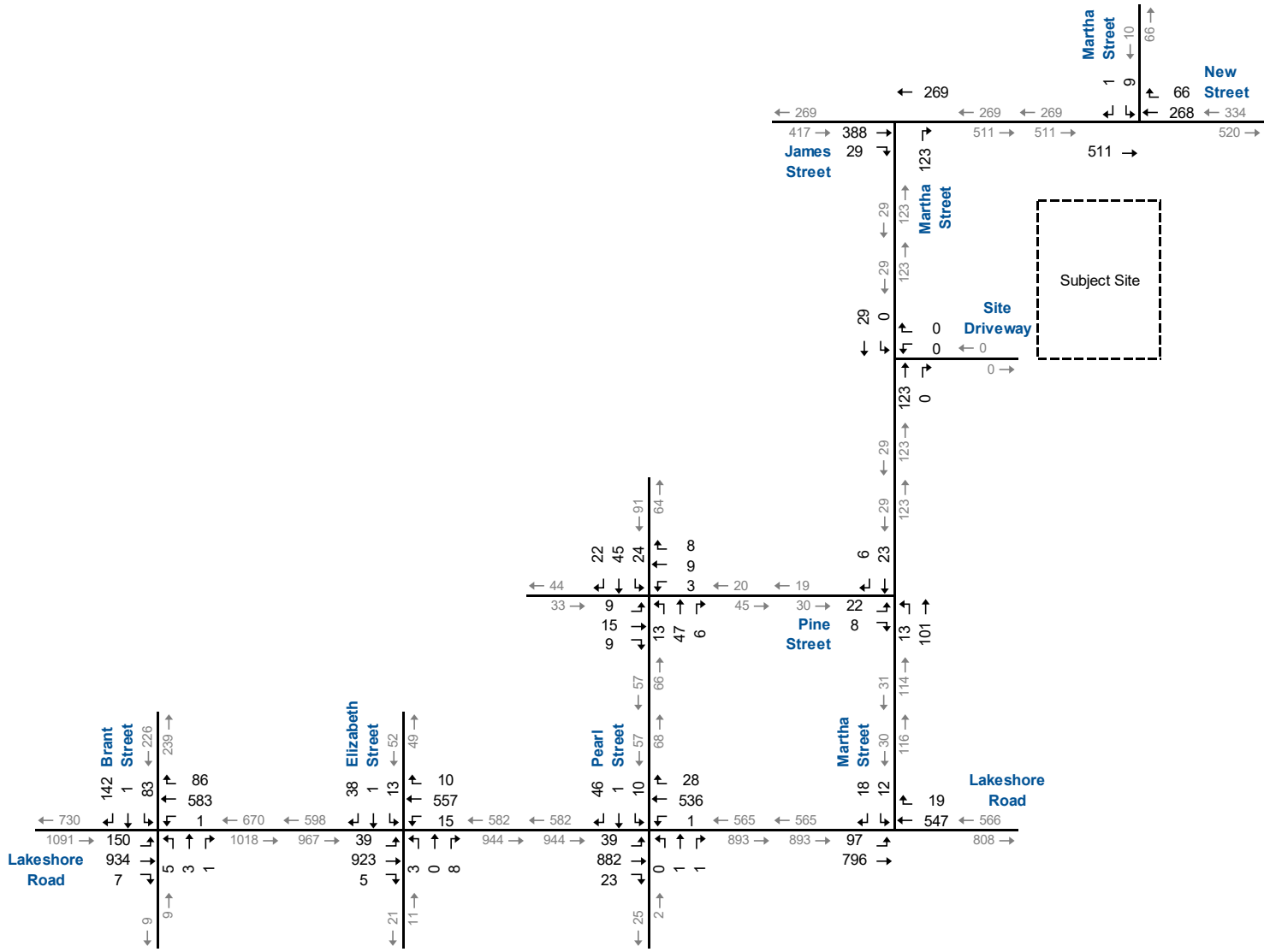
2.4.2 Base Year Adjustments

Turning movement counts conducted prior to year 2020 have been factored with the use of a 1.0% per annum growth rate to reflect 2020 Base Year conditions.

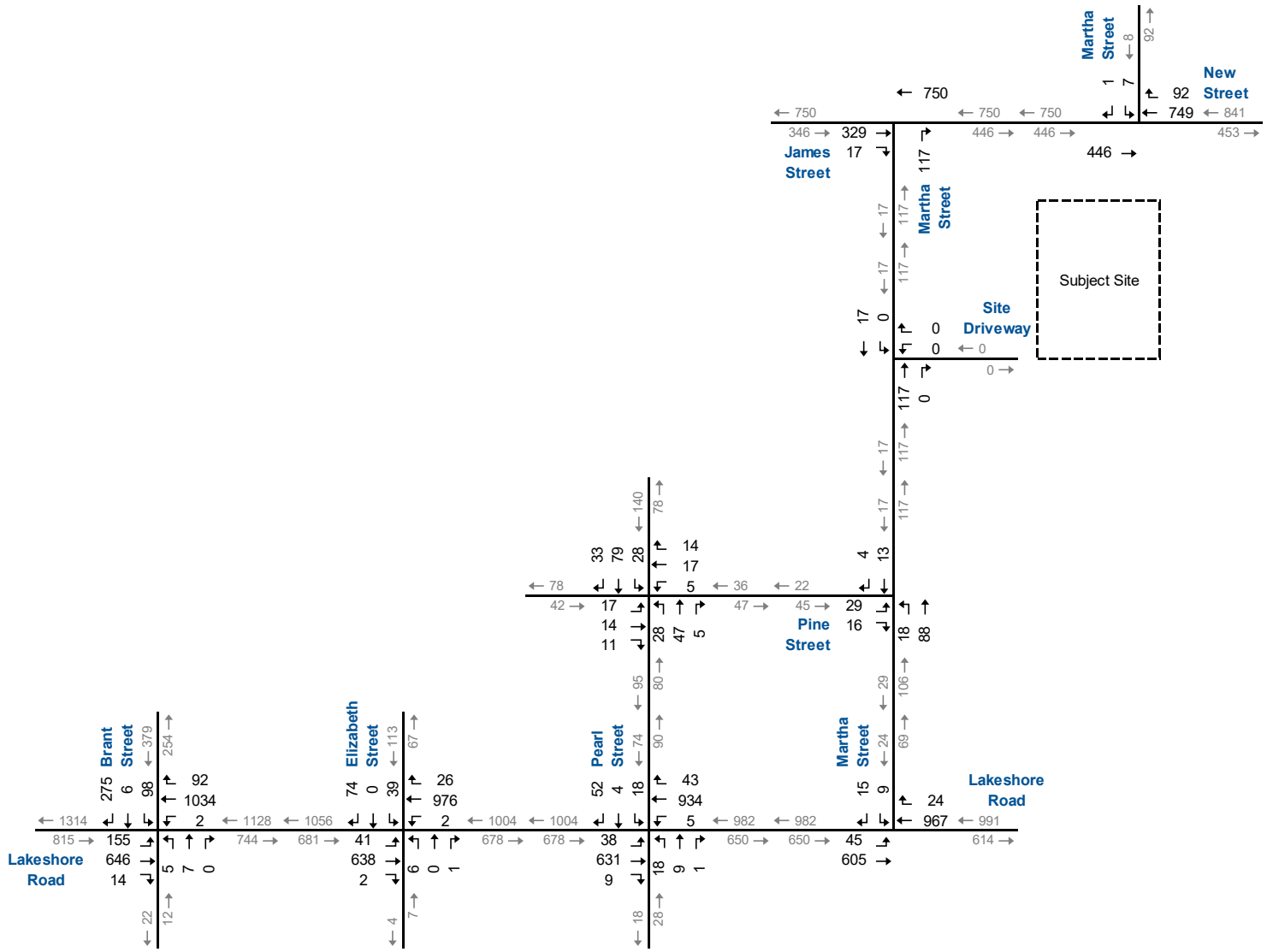
2.4.3 Volume Balancing

Traffic volume balancing was applied on Lakeshore Road between Elizabeth Street and Martha Street and along Martha Street between Pine Street and James Street as no major intersections or access points exist between these intersections.

Figure 2.4A and **Figure 2.4B** illustrate the resulting base year traffic volumes with adjustments incorporated as described herein.



Adjusted Base Year Traffic Volumes
AM Peak Hour



Adjusted Base Year Traffic Volumes
PM Peak Hour

2.5 Existing Traffic Operations

The existing operations of the intersections in the study area were evaluated with the base year traffic volumes using Synchro 9.2 with HCM 2000 procedures.

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 drivers 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 unsignalized 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 ratio is greater than 1.00, the movement is classed 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

LOS	Signalized Intersections Average Total Delay (sec/veh)	Stop-Controlled Intersections Average Total Delay (sec/veh)	LOS Recommendation
A	≤ 10	≤ 10	Acceptable
B	> 10 & ≤ 20	> 10 & ≤ 15	Acceptable
C	> 20 & ≤ 35	> 15 & ≤ 25	Acceptable
D	> 35 & ≤ 55	> 25 & ≤ 35	Somewhat undesirable
E	> 55 & ≤ 80	> 35 & ≤ 50	Undesirable
F	> 80	> 50	Undesirable

The intersection analyses considered the following measures of effectiveness:

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

The key parameters used in the analysis include:

- Existing lane configurations as documented during the site visit;
- Heavy vehicle percentages as derived from the existing turning movement counts;
- Signal timings as provided by the City;
- Peak hour factors (PHF) of 0.92; and
- Synchro default values for all other inputs.

Table 2.3A and **Table 2.3B** summarizes the results of the analysis for the existing weekday AM and PM peak hour intersection operations. The key results of the analysis are as follows:

- The signalized intersection of Lakeshore Road and Brant Street is operating at overall acceptable levels of service during the weekday the peak hours.
  - The eastbound through movement is noted to be over capacity (v/c ratio is 1.10) in the AM peak hour.
  - In the PM peak hour, the 95th percentile queue length of the southbound through lane is expected to exceed the available storage lane length by 44 metres;
- The signalized intersection of Lakeshore Road and Elizabeth Street is operating with acceptable levels of service during the weekday peak hours. Side street delays are noted to be LOS D with corresponding v/c ratios not exceeding 0.33;
- The signalized intersection of Lakeshore Road and Old Lakeshore Road/Pearl Street is operating with acceptable levels of service during the weekday peak hours. Side street delays are noted to be LOS E or better with corresponding v/c ratios not exceeding 0.28;
- The unsignalized intersection of Lakeshore Road and Martha Street is operating with acceptable levels of service during the weekday peak hours;

- The unsignalized intersection of Pearl Street and Pine Street is operating with acceptable levels of service during the weekday peak hours;
- The unsignalized intersection of Martha Street and James Street is operating with acceptable levels of service during the weekday peak hours; and
- The signalized intersection of Martha Street and James Street/New Street is operating with acceptable levels of service during the weekday peak hours.

Appendix C contains the detailed Synchro reports.

TABLE 2.3A: BASE YEAR 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 - Lakeshore Road & Brant Street	TCS	LOS	A	E	>	E	A	A	>	A	<	C	>	C	C	C	>	C	D
			Delay	6	75	>	66	10	10	>	10	<	26	>	26	29	26	>	27	43
			V/C	0.37	1.10	>		0.41	0.41	>		<	0.04	>		0.39	0.12	>		0.86
			Q	15	281	>		1	48	>		<	5	>		26	15	>		
			Ex	55	-	>		25	-	>		<	-	>		-	15	>		
			Avail.	41	-	>		24	-	>		<	-	>		-	0	>		
	2 - Lakeshore Road & Elizabeth Street	TCS	LOS	A	A	>	A	A	A	>	A	<	D	>	D	D	D	>	D	A
			Delay	2	7	>	6	2	2	>	2	<	40	>	40	41	40	>	40	6
			V/C	0.08	0.72	>		0.08	0.23	>		<	0.01	>		0.16	0.05	>		0.67
			Q	4	133	>		2	17	>		<	1	>		8	10	>		
			Ex	-	-	>		25	-	>		<	-	>		20	-	>		
			Avail.	-	-	>		23	-	>		<	-	>		12	-	>		
	3 - Lakeshore Road & Old Lakeshore Road/Pearl Street	TCS	LOS	A	A	>	A	A	A	>	A	<	D	>	D	D	D	>	D	A
			Delay	2	5	>	5	1	2	>	2	<	42	>	42	43	42	>	42	5
			V/C	0.07	0.71	>		0.00	0.23	>		<	0.01	>		0.12	0.05	>		0.66
			Q	3	118	>		0	16	>		<	2	>		7	11	>		
			Ex	40	-	>		20	-	>		<	-	>		15	-	>		
			Avail.	37	-	>		20	-	>		<	-	>		8	-	>		
	4 - Lakeshore Road & Martha Street	TWSC	LOS	A	A		A		A	>	A	Approach Not Applicable				<	C	>	C	
			Delay	9	0		1		0	>	0					<	17	>	17	
			V/C	0.11	0.51				0.36	>						<	0.10	>		
			Q	3	0				0	>						<	3	>		
			Ex	15	-				-	>						<	-	>		
			Avail.	12	-				-	>						<	-	>		
	5 - Martha Street & Pine Street	TWSC	LOS	<	A	>	A	Approach Not Applicable				<	A		A		A	>	A	
			Delay	<	9	>	9					<	1		1		0	>	0	
			V/C	<	0.04	>						<	0.01				0.02	>		
			Q	<	1	>						<	0				0	>		
			Ex	<	-	>						<	-				-	>		
			Avail.	<	-	>						<	-				-	>		
	6 - Pearl Street & Pine Street	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	8	>	8	<	8	>	8	
			V/C	<	0.04	>		<	0.03	>		<	0.08	>		<	0.11	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	7 - Martha Street & James Street	TWSC	LOS		A	A	A		A		A			B	B	Approach Not Applicable				
			Delay		0	0	0		0		0			12	12					
			V/C		0.25	0.02			0.17					0.21						
			Q		0	0			0					6						
			Ex		-	-			-					-						
			Avail.		-	-			-					-						
	8 - Martha Street & James Street/New Street	TCS	LOS		B		B		A	A	A	Approach Not Applicable				B		B	B	B
			Delay		13		13		10	8	9					15		15	15	11
			V/C		0.55				0.30	0.05						0.02		0.00		0.35
			Q		73				34	5						4		1		
			Ex		-				-	-						15		-		
			Avail.		-				-	-						11		-		

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

TABLE 2.3B: BASE YEAR 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 - Lakeshore Road & Brant Street	TCS	LOS	B	B	>	B	A	B	>	B	<	C	>	C	D	D	>	D	B
			Delay	12	17	>	16	8	14	>	14	<	34	>	34	38	43	>	42	19
			V/C	0.60	0.71	>		0.01	0.64	>		<	0.05	>		0.47	0.63	>		0.68
			Q	24	191	>		2	137	>		<	7	>		37	59	>		
			Ex	55	-	>		25	-	>		<	-	>		-	15	>		
			Avail.	31	-	>		23	-	>		<	-	>		-	-44	>		
	2 - Lakeshore Road & Elizabeth Street	TCS	LOS	A	A	>	A	A	A	>	A	<	D	>	D	D	D	>	D	A
			Delay	3	4	>	4	2	3	>	3	<	41	>	41	44	42	>	43	6
			V/C	0.15	0.50	>		0.01	0.42	>		<	0.01	>		0.33	0.06	>		0.48
			Q	5	69	>		1	44	>		<	0	>		19	4	>		
			Ex	-	-	>		25	-	>		<	-	>		20	-	>		
			Avail.	-	-	>		24	-	>		<	-	>		1	-	>		
	3 - Lakeshore Road & Old Lakeshore Road/Pearl Street	TCS	LOS	A	A	>	A	A	A	>	A	<	D	>	D	D	D	>	D	A
			Delay	2	3	>	3	1	3	>	3	<	48	>	48	47	46	>	46	5
			V/C	0.11	0.49	>		0.01	0.40	>		<	0.28	>		0.18	0.07	>		0.47
			Q	4	56	>		1	34	>		<	16	>		12	13	>		
			Ex	40	-	>		20	-	>		<	-	>		15	-	>		
			Avail.	36	-	>		19	-	>		<	-	>		4	-	>		
	4 - Lakeshore Road & Martha Street	TWSC	LOS	B	A		A		A	>	A	Approach Not Applicable				<	C	>	C	
			Delay	11	0		1		0	>	0					<	21	>	21	
			V/C	0.08	0.39				0.63	>						<	0.10	>		
			Q	2	0				0	>						<	3	>		
			Ex	15	-				-	>						<	-	>		
			Avail.	13	-				-	>						<	-	>		
	5 - Martha Street & Pine Street	TWSC	LOS	<	A	>	A	Approach Not Applicable				<	A		A		A	>	A	
			Delay	<	9	>	9					<	1		1		0	>	0	
			V/C	<	0.05	>						<	0.01				0.01	>		
			Q	<	1	>						<	0				0	>		
			Ex	<	-	>						<	-				-	>		
			Avail.	<	-	>						<	-				-	>		
	6 - Pearl Street & Pine Street	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	8	>	8	
			V/C	<	0.05	>		<	0.04	>		<	0.10	>		<	0.17	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	7 - Martha Street & James Street	TWSC	LOS		A	A	A		A		A			B	B	Approach Not Applicable				
			Delay		0	0	0		0		0			11	11					
			V/C		0.21	0.01			0.48					0.18						
			Q		0	0			0					5						
			Ex		-	-			-					-						
			Avail.		-	-			-					-						
	8 - Martha Street & James Street/New Street	TCS	LOS		A		A		A	A	A	Approach Not Applicable				D		D	D	
			Delay		1		1		2	1	2					40		39	40	
			V/C		0.30				0.50	0.07						0.15		0.00		
			Q		24				53	4						6		2		
			Ex		-				-	-						15		-		
			Avail.		-				-	-						9		-		

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

3 Development Concept

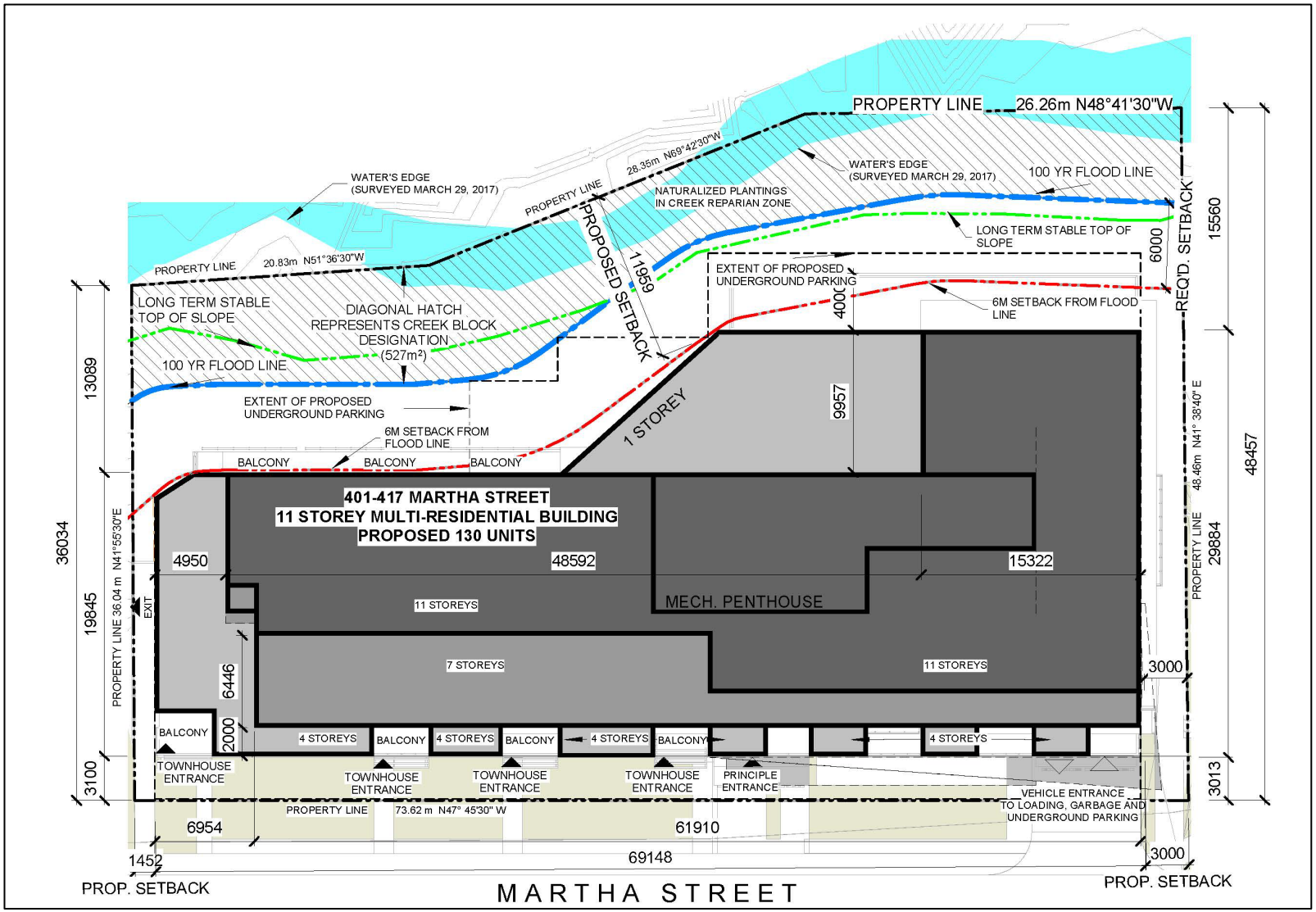
3.1 Site Description

Development of 401-417 Martha Street will include demolishing several existing buildings and constructing a 11-storey residential building that will contain 130 residential units. A four-level underground parking garage with 160 parking stalls for residents is provided in addition to seven (7) visitor surface parking spaces. In total 167 parking stalls are proposed. Build out is anticipated to occur in one phase at or before 2022.

Vehicular access to the site is proposed via one all movements driveway connection to Martha Street, located approximately 175 metres north of the intersection of Lakeshore Road and Martha Street (centreline to centreline). The Site Driveway has been designed to provide access to the underground parking garage and will operate with a single inbound and outbound travel lane.

A loading space on the ground level is proposed to accommodate garbage collection, loading and service activities of the development. Access to the loading facilities will be provided via the Site Driveway. Typically, separation of vehicle access and loading spaces is preferred. However, as the development has frontage to only a single public street, and the level of peak traffic activity expected at the loading spaces is expected to be low, this arrangement is noted to be appropriate and will support the proposed development.

Figure 3.1 illustrates the conceptual layout of the ground floor of the development.



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Proposed Site Plan

3.2 Trip Generation

Trip generation information is used to forecast the anticipated level of traffic activity as a result of the development. Trip generation for each land use type were summed to establish total site trip generation for the respective weekday AM and PM peak hours. The following sub-sections provides the methodology used.

3.2.1 Institute of Transportation Engineers (ITE)

The rate at which any development generates traffic is dependent upon a number of factors such as size, location and concentration of surrounding developments. To estimate the volume of traffic generated by the Development, traffic projections were based on trip generation data published in ITE's Trip Generation, 10th Edition[4]. Land use code 222 – Multi-Family Housing (High-Rise) was used.

Data for the peak hour of adjacent street traffic were used to estimate trip generation. Fitted curve equations with satisfactory R^2 values and independent variables were applied.

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

3.2.2 Modal Split

It is recognized that transit, cyclist and pedestrian facilities that surround the subject site will likely result in some residential trips being made by bike or on foot. This causes a reduction in the overall trip generation estimates. Data on primary modes of transportation for all trips within GTA 2006 Zone (4060) was extracted from the 2016 Transportation Tomorrow Survey (TTS)[5] and is outlined in **Table 3.1**.

Travel by modes other than vehicles is relatively high within the immediate area as close to 30% utilize sustainable travel. Based on the TTS data and to remain conservative (err on the high side), *a reduction of 20% has* been applied to account for travel by transit and active travel modes.

[4] Trip Generation Tenth Edition, Institute of Transportation Engineers, Washington D.C., 2017

[5] Transportation Tomorrow Survey (TTS), 2016, Summary by Traffic Zones, Data Management Group, University of Toronto.

TABLE 3.1: 2016 TTS MODE OF TRAVEL

Modes of Travel	%
Walk	5%
Vehicle (Driver)	72%
Vehicle (Passenger)	14%
Transit	9%
Cycle	0%
Total	**100%**
Sustainable Modal Split (Transit/Walk/Cycle/Carpool)	**28%**

3.2.3 Net Trip Generation Estimates

Table 3.2 summarizes the projected trip generation associated with the build-out of the development. These estimates were based on the standardized ITE rates with modal split credits made as noted earlier.

As shown, with build-out of the development, approximately 40 new trips during the weekday AM peak hour and 43 new trips during the weekday PM peak hour are forecast to be added to the area roadways.

TABLE 3.2: DEVELOPMENT TRIP GENERATION SUMMARY

Land Use Code	Units	Trips	AM Peak Hour				PM Peak Hour			
			Rate	In	Out	Total	Rate	In	Out	Total
222 - Multi-Family Housing High Rise (Units)	130	Total	Eqn.	12	37	**49**	Eqn.	32	21	**53**
		Mode Split	20%	2	7	**9**	20%	6	4	**10**
		New	80%	10	30	**40**	80%	26	17	**43**
Total Trip Generation		**Total**	100%	12	37	49	100%	32	21	53
		Mode Split	20%	2	7	9	20%	6	4	10
		New	80%	10	30	40	80%	26	17	43

3.3 Development Trip Distribution and Assignment

3.3.1 Trip Distribution

The trip distribution for the site was developed based on the 2016 Transportation Tomorrow Survey (TTS)[6]. For the Burlington Zone, the trip distribution was further refined based on the existing link volumes at the external limits of the study area. The trip distribution calculations are included in **Appendix D**.

Table 3.3 summarizes the estimated trip distribution for the development.

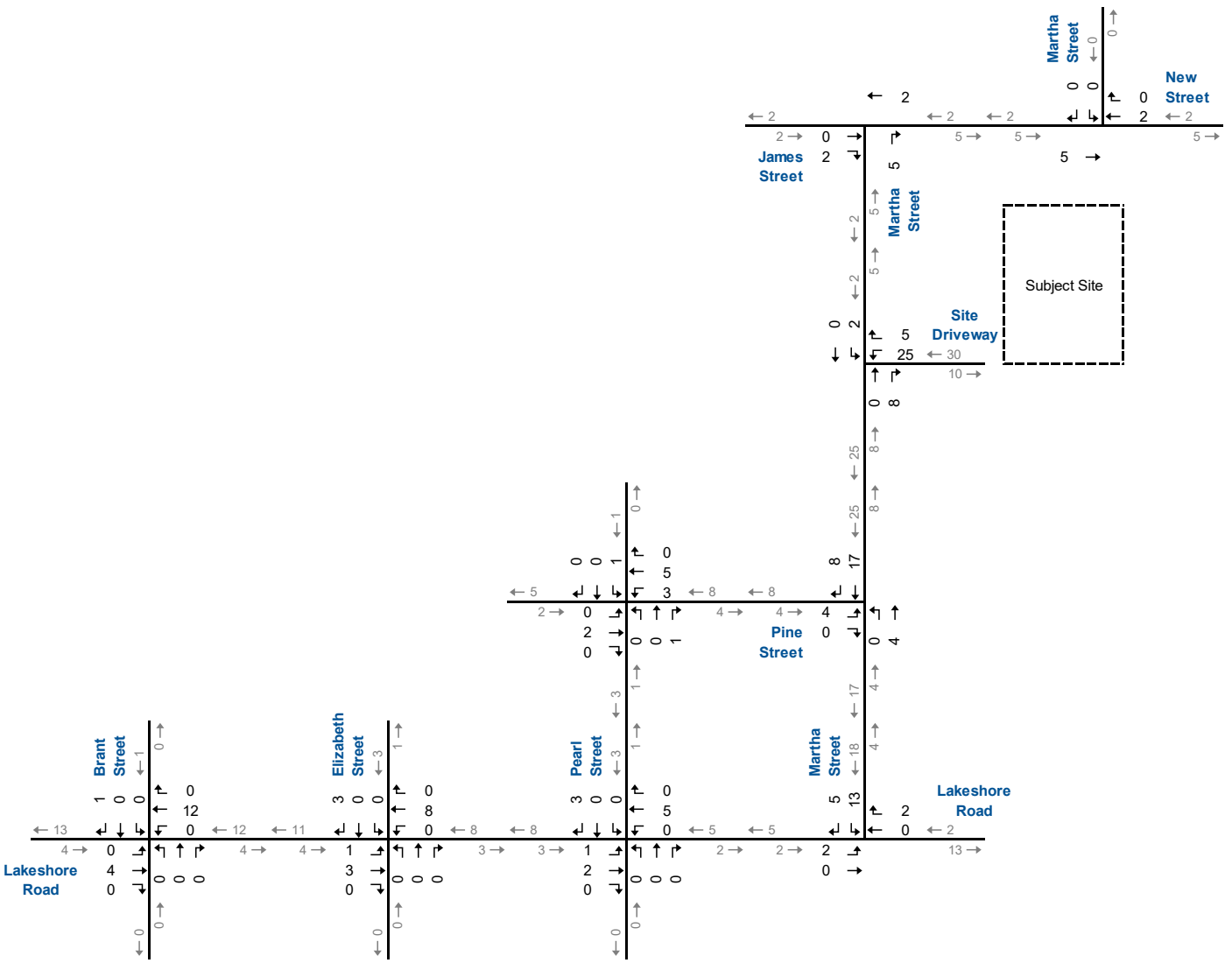
TABLE 3.3: TRIP DISTRIBUTION

Direction (To/From)	Travel Route	Distribution
North	Brant Street	22%
East	Lakeshore Road	21%
	New Street	15%
West	Lakeshore Road	42%
	Total	**100%**

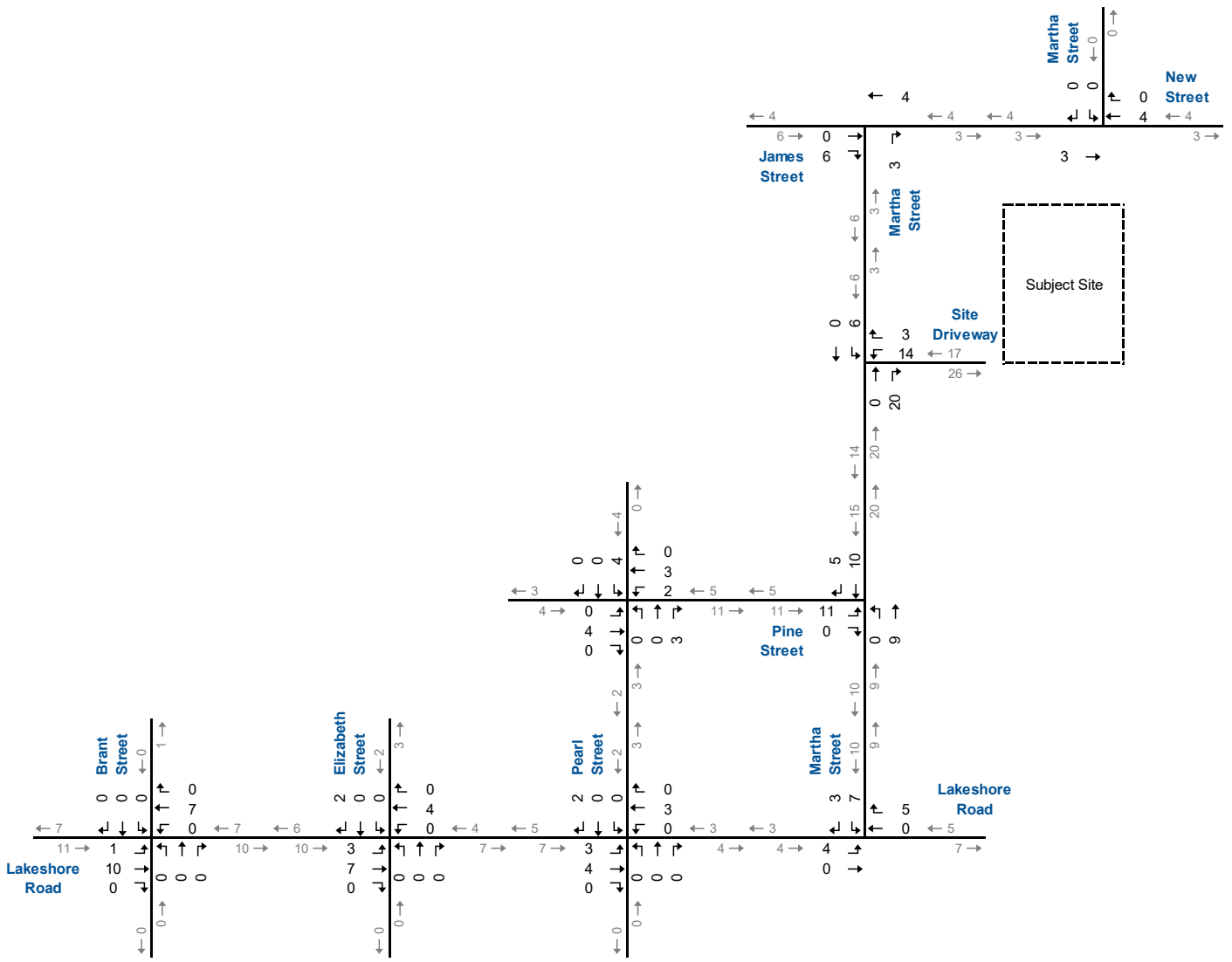
3.3.2 Assignment

Using the trip generation and trip distribution estimates, the site traffic was assigned to the road network. The assignment of site generated traffic to specific travel routes was based on the assumption that most motorists seek the fastest and most direct routes to and from the site. **Figure 3.2** illustrate the weekday AM and PM peak hour site generated traffic volumes, respectively.

6 Transportation Tomorrow Survey (TTS), 2016, Summary by Wards, Data Management Group, University of Toronto.



Site Generated Traffic Forecasts
AM Peak Hour



Site Generated Traffic Forecasts
PM Peak Hour

4 Future Traffic

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, a horizon year of 2027, five (5) years beyond the anticipated opening year (2022), has been used for traffic forecasting and analyses purposes.

4.1 Background Growth

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. Consequently, for this analysis, an annual percentage increase was applied to the base year traffic volumes and then estimated traffic generated by nearby planned developments was added to this general background traffic. The following sections describe this process and the results in more detail.

4.1.1 General Growth

Generalized traffic growth was determined by applying a growth rate of 1.0% per annum to the base year volumes. This growth rate was confirmed with City staff during pre-consultation and resulted in a total growth of 7.21% for the 2027 horizon year.

4.1.2 Other Area Developments

In year 2027, other new developments in the area that will further increase the traffic volumes on the area roadways. The City's Planning Department advised that there are several approved and in-stream residential and commercial developments within close proximity of the study area.

Figure 4.1 illustrates the general locations of these developments, **Table 4.1** outlines the corresponding land use statistics.



Approved and In-Stream Developments

TABLE 4.1: APPROVED OR IN-STREAM DEVELOPMENTS

Development	Development Plans
501-515 John Street; 2080 Caroline Street; 500 Elizabeth Street; and 2027 Maria Street	154 residential units; and 8,521 SM (91,719 SF) medial land uses
2042 - 2054 Lakeshore Road	170 residential units; 152 hotel suites; and 770 SM (8,285 SF) commercial land uses
374 Martha Street	192 residential units; and 327 SM (3,520 SF) commercial land uses
421 - 431 Brant Street	183 residential units; 1,390 SM (14,961 SF) office land uses; and 965 SM (10,407 SF) commercial land uses
409 Brant Street	227 residential units; and 596 SM (6,425 SF) commercial land uses
2069 Lakeshore Road	232 residential units; and 645 SM (6,945 SF) commercial land uses
2082, 2086 & 2090 James Street	153 residential units
2085 Pine	39 residential units 112 SM (1,210 SF) commercial land uses
2096 Lakeshore CORE	310 residential units 707 SM (7619 SF) commercial land uses

SF - Square Feet

SM - Square Metres

Projections from the other area developments have been previously forecast in the 409 Brant Street Transportation Impact Study[7] and the Martha-James Transportation Impact Study[8] These studies provide the best source for the overall development context and traffic growth expectations for the immediate study area. **Appendix E** illustrates the in-stream development forecasts as taken from that study.

[7] 409 Brant Street Transportation Impact Study, Parking Study and TDM Options Report, Prepared for Reserve Properties Ltd. By Paradigm, January 2018.

[8] Martha-James Transportation Impact Study, Prepared for Mattamy Homes, by BA Group, November 2017.

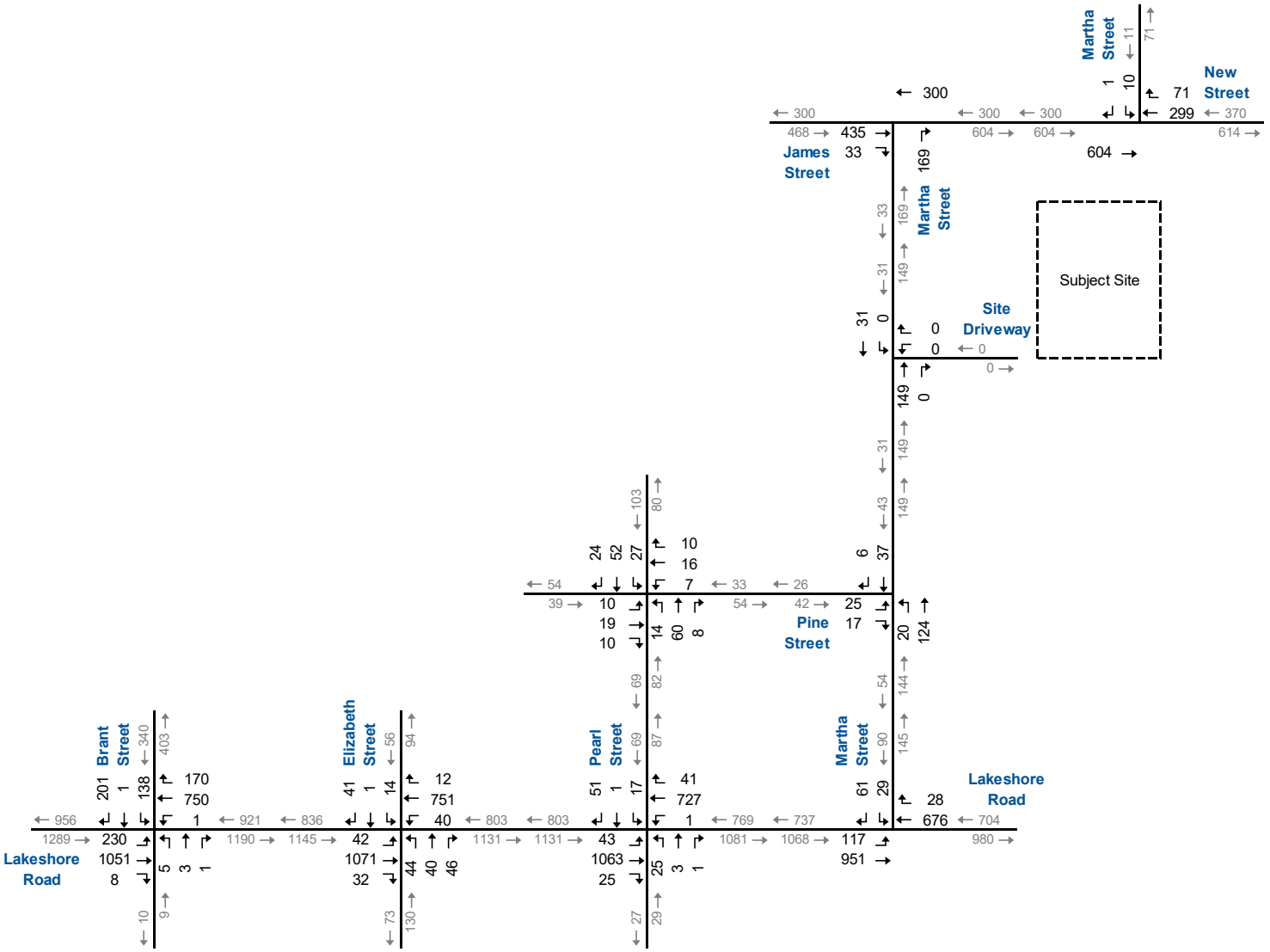


4.2 Background Traffic Forecasts

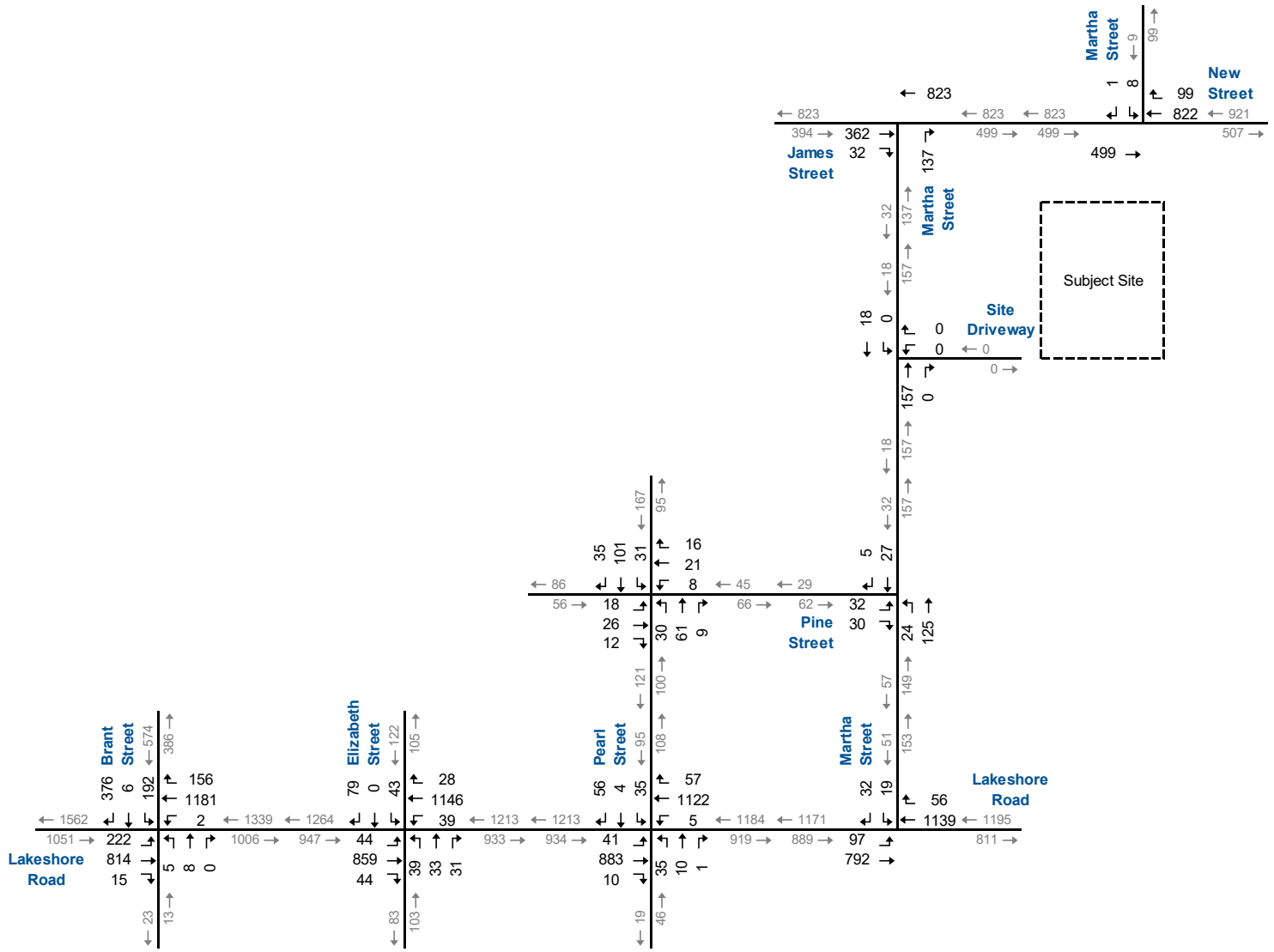
The background traffic forecasts from the other area developments was added to the 2027 generalized background traffic volumes to achieve the 2027 total background traffic volumes. **Figure 4.2** illustrate the AM and PM peak hour 2027 total background traffic forecasts, respectively.

4.3 Total Traffic Forecasts

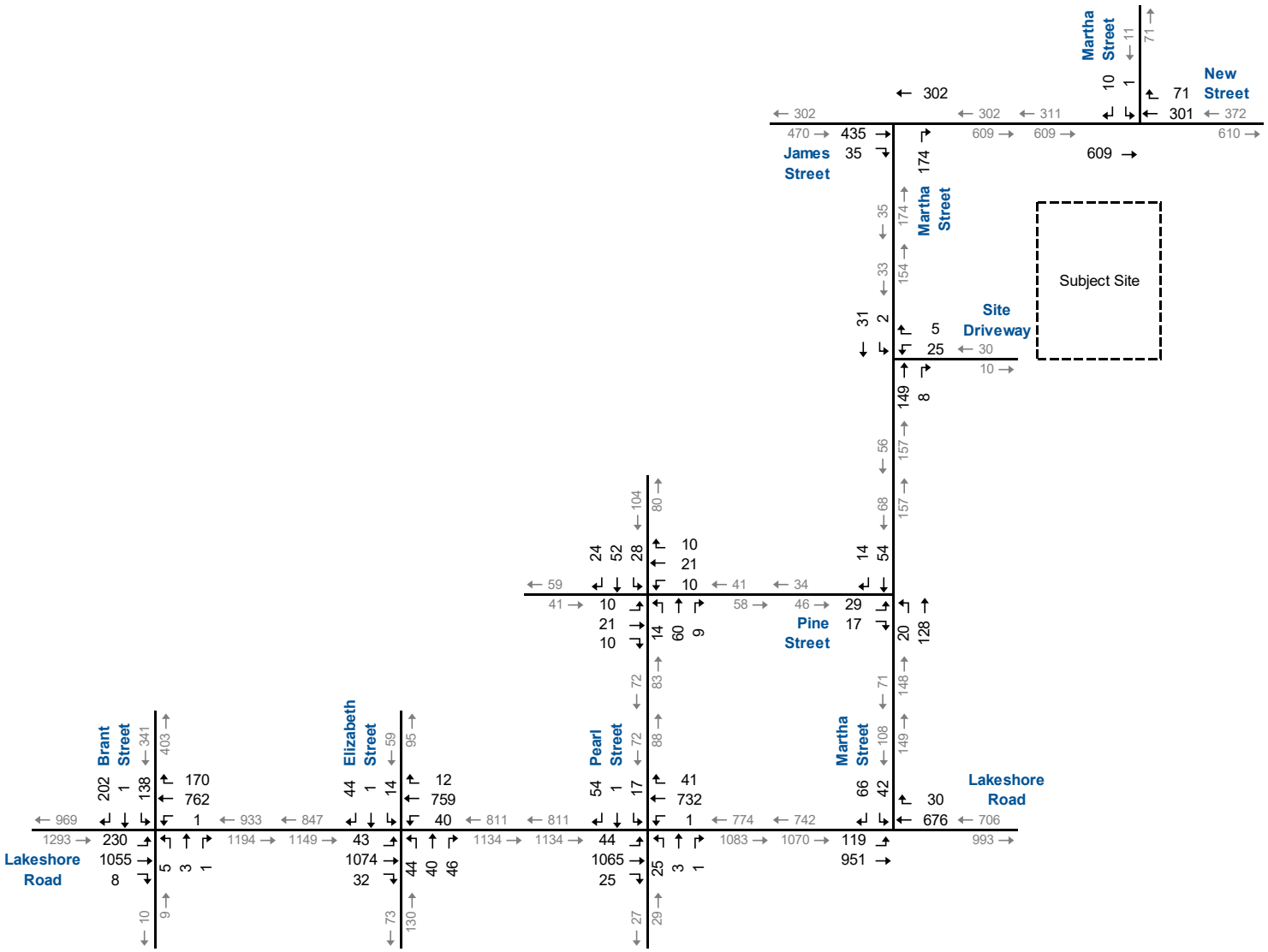
The total traffic volumes within the study area are estimated to consist of generalized background traffic growth of 1.0% per annum, traffic related to the nearby developments and development site-generated traffic. **Figure 4.3** illustrate the AM and PM peak hour 2027 total traffic forecasts, respectively.



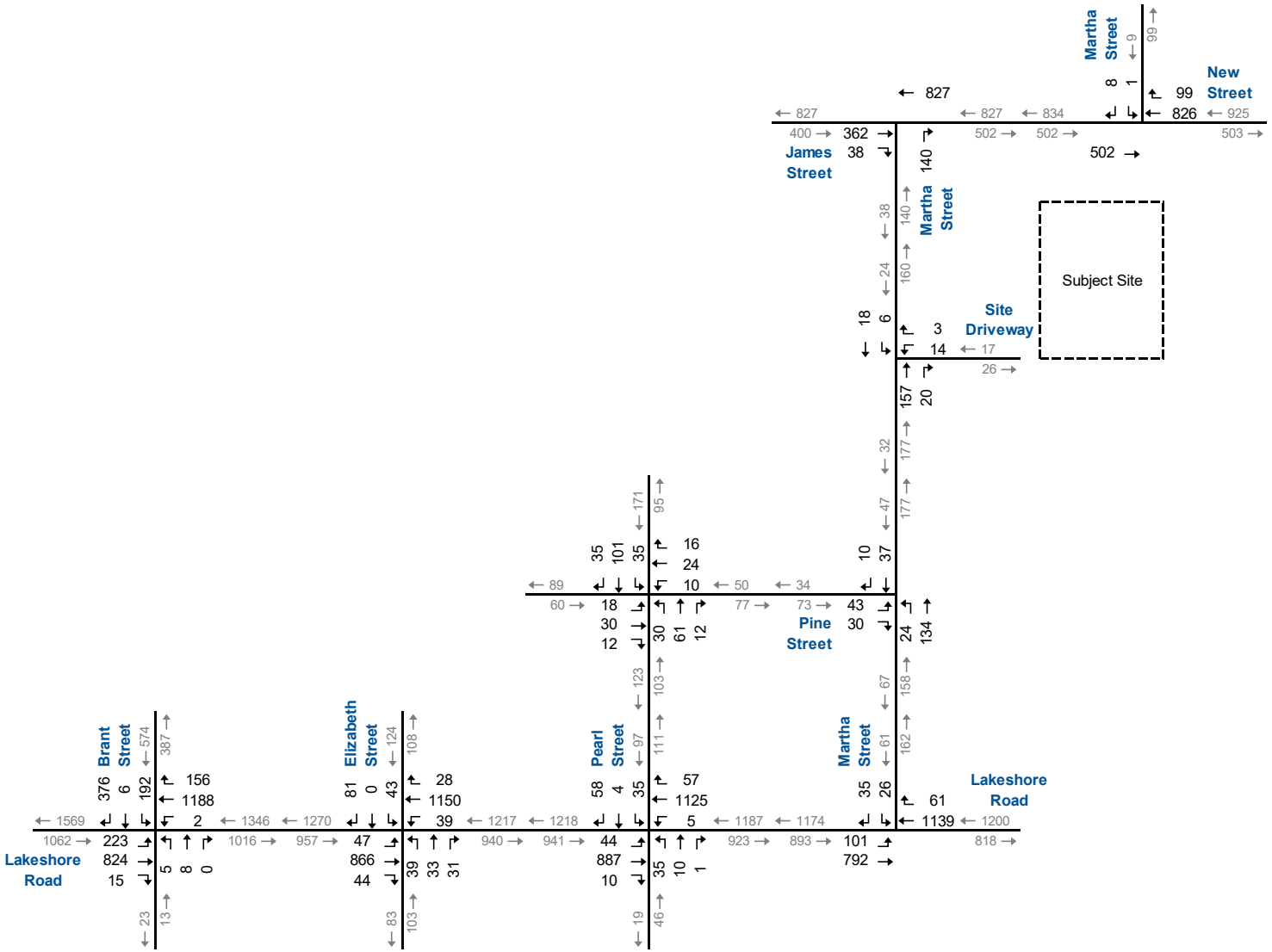
2027 Background Traffic Forecasts
AM Peak Hour



2027 Background Traffic Forecasts
PM Peak Hour



2027 Total Traffic Forecasts
AM Peak Hour



2027 Total Traffic Forecasts
PM Peak Hour

Figure 4.3B

5 Analysis

Measuring existing traffic volumes and projecting future traffic volumes quantifies traffic within the study area. To assess quality of flow, roadway capacity analysis was conducted with respect to projected background and total conditions.

5.1 Background Traffic Capacity Analysis

Table 5.1 summarizes the capacity analyses for the study area intersections under the 2027 Background conditions for the AM and PM peak hours with optimized timings splits. **Appendix F** includes the capacity analyses results.

- The signalized intersection of Lakeshore Road and Brant Street is forecast to operate at overall acceptable levels of service during the weekday the peak hours.
  - The eastbound through movement is noted to be over capacity the AM peak hour, with a v/c ratio of 1.20, and nearly at capacity in the PM peak hour, with a v/c ratio of 0.99;
  - In the PM peak hour, the 95th percentile queue length of the eastbound left-turn movement is expected to exceed the provided storage lane length by 41 metres;
  - The 95th percentile queue length of the southbound through movement is expected to exceed the provided storage lane length during both peak hours (by 2 metres in the AM peak hour and 74 metres in the PM peak hour).
- The signalized intersection of Lakeshore Road and Elizabeth Street is forecast to operate at acceptable levels of service during the weekday peak hours.
  - The eastbound through movement is noted to be approaching capacity in the AM peak hour (v/c ratio is 0.96);
  - Side street delays are noted to be LOS D or better with corresponding v/c ratios no greater than 0.56.
- The signalized intersection of Lakeshore Road and Pearl Street/Old Lakeshore Road at acceptable levels of service during the weekday peak hours.
  - Side street delays are noted to be LOS D or better with corresponding v/c ratios no greater than 0.42;
  - On Lakeshore, in the AM peak hour, a v/c ratio of 0.86 is projected for the eastbound through movement; this



movement is operating at 86% (or less) of its available capacity. Thus, mitigation measures are not required.

- The unsignalized intersection of Lakeshore Road and Martha Street is forecast to operate with acceptable levels of service during the weekday peak hours.
  - Southbound on Martha Street delays are noted to be LOS E or better with corresponding v/c ratios no greater than 0.34;
  - In the PM peak hour, the 95th percentile queue length of the eastbound left-turn movement is expected to exceed the available storage capacity by 4 metres;
  - On Lakeshore, v/c ratios are not projected to exceed 0.74 (i.e. the approach is operating at 74%, or less, of its available capacity). Thus, mitigation measures are not required.
- The unsignalized intersection of Martha Street and Pine Street is forecast to operate with acceptable levels of service during the weekday peak hours;
- The unsignalized intersection of Pearl Street and Pine Street is forecast to operate with acceptable levels of service during the weekday peak hours;
- The unsignalized intersection of Martha Street and James Street is forecast to operate with acceptable levels of service during the weekday peak hours; and
- The signalized intersection of Martha Street and James Street/New Street is forecast to operate with acceptable levels of service during the weekday peak hours.

TABLE 5.1A: 2027 BACKGROUND 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 - Lakeshore Road & Brant Street	TCS	LOS	C	F	>	F	B	B	>	B	<	C	>	C	C	C	>	C	E
			Delay	22	119	>	101	12	12	>	12	<	26	>	26	32	27	>	29	59
			V/C	0.80	1.20	>		0.57	0.57	>		<	0.03	>		0.55	0.16	>		1.01
			Q	45	359	>		1	82	>		<	5	>		41	17	>		
			Ex	55	-	>		25	-	>		<	-	>		-	15	>		
			Avail.	10	-	>		24	-	>		<	-	>		-	-2	>		
	2 - Lakeshore Road & Elizabeth Street	TCS	LOS	A	C	>	C	C	A	>	A	<	D	>	D	D	D	>	D	C
			Delay	4	29	>	28	34	5	>	6	<	42	>	42	36	35	>	35	21
			V/C	0.12	0.96	>		0.57	0.35	>		<	0.56	>		0.11	0.04	>		0.88
			Q	8	367	>		28	46	>		<	42	>		8	10	>		
			Ex	-	-	>		25	-	>		<	-	>		20	-	>		
			Avail.	-	-	>		-3	-	>		<	-	>		12	-	>		
	3 - Lakeshore Road & Old Lakeshore Road/Pearl Street	TCS	LOS	A	B	>	B	A	A	>	A	<	D	>	D	D	D	>	D	A
			Delay	2	11	>	10	2	2	>	2	<	44	>	44	43	42	>	43	9
			V/C	0.10	0.86	>		0.00	0.32	>		<	0.28	>		0.17	0.05	>		0.80
			Q	4	301	>		0	25	>		<	14	>		10	12	>		
			Ex	40	-	>		20	-	>		<	-	>		15	-	>		
			Avail.	36	-	>		20	-	>		<	-	>		5	-	>		
	4 - Lakeshore Road & Martha Street	TWSC	LOS	B	A		A		A	>	A	Approach Not Applicable				<	C	>	C	
			Delay	10	0		1		0	>	0					<	22	>	22	
			V/C	0.15	0.61				0.45	>						<	0.30	>		
			Q	4	0				0	>						<	10	>		
			Ex	15	-				-	>						<	-	>		
			Avail.	11	-				-	>						<	-	>		
	5 - Martha Street & Pine Street	TWSC	LOS	<	A	>	A	Approach Not Applicable				<	A		A		A	>	A	
			Delay	<	10	>	10					<	1		1		0	>	0	
			V/C	<	0.05	>						<	0.01				0.03	>		
			Q	<	1	>						<	0				0	>		
			Ex	<	-	>						<	-				-	>		
			Avail.	<	-	>						<	-				-	>		
	6 - Pearl Street & Pine Street	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	8	>	8	
			V/C	<	0.05	>		<	0.04	>		<	0.10	>		<	0.13	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	7 - Martha Street & James Street	TWSC	LOS		A	A	A		A		A			B	B	Approach Not Applicable				
			Delay		0	0	0		0		0			12	12					
			V/C		0.28	0.02			0.19					0.16						
			Q		0	0			0					5						
			Ex		-	-			-					-						
			Avail.		-	-			-					-						
	8 - Martha Street & James Street/New Street	TCS	LOS		B		B		A	A	A	Approach Not Applicable				B		B	B	B
			Delay		15		15		10	8	9					15		15	15	13
			V/C		0.50				0.33	0.05						0.02		0.00		0.31
			Q		64				38	5						4		1		
			Ex		-				-	-						15		-		
			Avail.		-				-	-						11		-		
PM Peak Hour	1 - Lakeshore Road & Brant Street	TCS	LOS	E	D	>	E	B	C	>	C	<	C	>	C	D	D	>	D	D
			Delay	72	54	>	58	12	28	>	28	<	33	>	33	50	50	>	50	43
			V/C	0.94	0.99	>		0.03	0.86	>		<	0.05	>		0.74	0.76	>		0.92
			Q	96	325	>		2	212	>		<	8	>		73	89	>		
			Ex	55	-	>		25	-	>		<	-	>		-	15	>		
			Avail.	-41	-	>		23	-	>		<	-	>		-	-74	>		

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

TABLE 5.1B: 2027 BACKGROUND 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 - Lakeshore Road & Brant Street	TCS	LOS	E	D	>	**E**	B	C	>	**C**	<	C	>	**C**	D	D	>	**D**	**D**
			Delay	72	54	>	**58**	12	28	>	**28**	<	33	>	**33**	50	50	>	**50**	**43**
			V/C	0.94	0.99	>		0.03	0.86	>		<	0.05	>		0.74	0.76	>		**0.92**
			Q	96	325	>		2	212	>		<	8	>		73	89	>		
			Ex	55	-	>		25	-	>		<	-	>		-	15	>		
			Avail.	-41	-	>		23	-	>		<	-	>		-	-74	>		
	2 - Lakeshore Road & Elizabeth Street	TCS	LOS	A	B	>	**B**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**B**
			Delay	6	11	>	**11**	6	6	>	**6**	<	46	>	**46**	43	40	>	**41**	**11**
			V/C	0.21	0.75	>		0.22	0.52	>		<	0.52	>		0.33	0.07	>		**0.72**
			Q	9	319	>		9	80	>		<	38	>		21	11	>		
			Ex	-	-	>		25	-	>		<	-	>		20	-	>		
			Avail.	-	-	>		17	-	>		<	-	>		-1	-	>		
	3 - Lakeshore Road & Old Lakeshore Road/Pearl Street	TCS	LOS	A	A	>	**A**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**A**
			Delay	2	5	>	**10**	2	3	>	**3**	<	49	>	**49**	48	45	>	**46**	**7**
			V/C	0.16	0.70	>		0.01	0.49	>		<	0.42	>		0.34	0.07	>		**0.78**
			Q	5	238	>		1	55	>		<	23	>		19	14	>		
			Ex	40	-	>		20	-	>		<	-	>		15	-	>		
			Avail.	35	-	>		19	-	>		<	-	>		-4	-	>		
	4 - Lakeshore Road & Martha Street	TWSC	LOS	C	A		**A**		A	>	**A**	**Approach Not Applicable**				<	E	>	**E**	
			Delay	17	0		**2**		0	>	**0**					<	35	>	**35**	
			V/C	0.45	0.51				0.74	>						<	0.34	>		
			Q	19	0				0	>						<	11	>		
			Ex	15	-				-	>						<	-	>		
			Avail.	-4	-				-	>						<	-	>		
	5 - Martha Street & Pine Street	TWSC	LOS	<	A	>	**A**	**Approach Not Applicable**				<	A		**A**		A	>	**A**	
			Delay	<	10	>	**10**					<	1		**1**		0	>	**0**	
			V/C	<	0.15	>						<	0.02				0.02	>		
			Q	<	2	>						<	0				0	>		
			Ex	<	-	>						<	-				-	>		
			Avail.	<	-	>						<	-				-	>		
	6 - Pearl Street & Pine Street	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	8	>	**8**	<	8	>	**8**	<	8	>	**8**	<	8	>	**8**	
			V/C	<	0.08	>		<	0.06	>		<	0.13	>		<	0.21	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	7 - Martha Street & James Street	TWSC	LOS		A	A	**A**		A		**A**			B	**B**	**Approach Not Applicable**				
			Delay		0	0	**0**		0		**0**			12	**12**					
			V/C		0.23	0.02			0.53					0.16						
			Q		0	0			0					5						
			Ex		-	-			-					-						
			Avail.		-	-			-					-						
	8 - Martha Street & James Street/New Street	TCS	LOS		A		**A**		A	A	**A**	**Approach Not Applicable**				D		D	**D**	**A**
			Delay		2		**2**		3	1	**2**					41		40	**41**	**2**
			V/C		0.33				0.54	0.07						0.18		0.00		**0.53**
			Q		28				63	4						6		2		
			Ex		-				-	-						15		-		
			Avail.		-				-	-						9		-		

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

5.2 Total Traffic Capacity Analysis

Table 5.2 summarizes the capacity analyses for the study area intersections under the 2027 Total conditions for the AM and PM peak hours with optimizing signal timings splits. A single inbound lane and a single outbound lane have been assumed for the proposed Site Driveway. **Appendix G** includes the capacity analyses results.

- The signalized intersection of Lakeshore Road and Brant Street is forecast to operate at or over capacity during the weekday peak hours.
  - The eastbound through movement is noted to be over capacity during both peak hours, with a v/c ratio of 1.21 in the AM peak hour and a v/c ratio of 1.01 in the PM peak hour;
  - In the PM peak hour, the 95th percentile queue length of the eastbound left-turn movement is expected to exceed the provided storage lane length by 42 metres;
  - The 95th percentile queue length of the southbound through movement is expected to exceed the provided storage lane length during both peak hours (by 2 metres in the AM peak hour and 74 metres in the PM peak hour).
- The signalized intersection of Lakeshore Road and Elizabeth Street is forecast to operate at overall acceptable levels of service during the weekday peak hours.
  - The eastbound through movement is noted to be approaching capacity in the AM peak hour (v/c ratio is 0.96);
  - Side street delays are noted to be LOS D or better with corresponding v/c ratios no greater than 0.56.
- The signalized intersection of Lakeshore Road and Pearl Street/Old Lakeshore Road is forecast to operate at overall acceptable levels of service during the weekday peak hours.
  - Side street delays are noted to be LOS D or better with corresponding v/c ratios no greater than 0.42;
  - On Lakeshore, in the AM peak hour, a v/c ratio of 0.86 is projected for the eastbound through movement; this movement is operating at 86% (or less) of its available capacity. Thus, mitigation measures are not required.
- The unsignalized intersection of Lakeshore Road and Martha Street is forecast to operate with acceptable levels of service during the weekday peak hours.



  - Southbound on Martha Street delays are noted to be LOS E or better with corresponding v/c ratios no greater than 0.44;
  - In the PM peak hour, the 95th percentile queue length of the eastbound left-turn movement is expected to exceed the available storage capacity by 4 metres;
  - On Lakeshore, v/c ratios are not projected to exceed 0.75 (i.e. the approach is operating at 75%, or less, of its available capacity). Thus, mitigation measures are not required.
- The unsignalized intersection of Martha Street and Pine Street is forecast to operate with acceptable levels of service during the weekday peak hours;
- The unsignalized intersection of Pearl Street and Pine Street is forecast to operate with acceptable levels of service during the weekday peak hours;
- The unsignalized intersection of Martha Street and James Street is forecast to operate with acceptable levels of service during the weekday peak hours; and
- The signalized intersection of Martha Street and James Street/New Street is forecast to operate with acceptable levels of service during the weekday peak hours.
- The proposed Site Driveway onto Martha Street is forecast to operate with acceptable levels of service during the weekday peak hours.

It should be emphasized that these operational conditions are similar to the conditions forecast for the 2027 background scenario.

TABLE 5.2A: 2027 TOTAL 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 - Lakeshore Road & Brant Street	TCS	LOS	C	F	>	F	B	B	>	B	<	C	>	C	C	C	>	C	E
			Delay	23	121	>	104	12	12	>	12	<	26	>	26	32	27	>	29	60
			V/C	0.81	1.21	>		0.57	0.57	>		<	0.03	>		0.55	0.16	>		1.01
			Q	46	361	>		1	83	>		<	5	>		41	17	>		
			Ex	55	-	>		25	-	>		<	-	>		-	15	>		
			Avail.	9	-	>		24	-	>		<	-	>		-	-2	>		
	2 - Lakeshore Road & Elizabeth Street	TCS	LOS	A	C	>	C	D	A	>	A	<	D	>	D	D	D	>	D	C
			Delay	4	29	>	28	36	5	>	6	<	42	>	42	36	35	>	35	21
			V/C	0.13	0.96	>		0.59	0.35	>		<	0.56	>		0.11	0.05	>		0.88
			Q	8	369	>		28	47	>		<	42	>		8	10	>		
			Ex	-	-	>		25	-	>		<	-	>		20	-	>		
			Avail.	-	-	>		-3	-	>		<	-	>		12	-	>		
	3 - Lakeshore Road & Old Lakeshore Road/Pearl Street	TCS	LOS	A	B	>	B	A	A	>	A	<	D	>	D	D	D	>	D	A
			Delay	2	11	>	10	2	2	>	2	<	44	>	44	43	42	>	43	9
			V/C	0.10	0.86	>		0.00	0.32	>		<	0.28	>		0.17	0.05	>		0.80
			Q	4	302	>		0	25	>		<	14	>		10	12	>		
			Ex	40	-	>		20	-	>		<	-	>		15	-	>		
			Avail.	36	-	>		20	-	>		<	-	>		5	-	>		
	4 - Lakeshore Road & Martha Street	TWSC	LOS	B	A		A		A	>	A	Approach Not Applicable				<	C	>	C	
			Delay	10	0		1		0	>	0					<	24	>	24	
			V/C	0.16	0.61				0.45	>						<	0.38	>		
			Q	4	0				0	>						<	14	>		
			Ex	15	-				-	>						<	-	>		
			Avail.	11	-				-	>						<	-	>		
	5 - Martha Street & Pine Street	TWSC	LOS	<	A	>	A	Approach Not Applicable				<	A		A		A	>	A	
			Delay	<	10	>	10					<	1		1		0	>	0	
			V/C	<	0.06	>						<	0.01				0.04	>		
			Q	<	2	>						<	0				0	>		
			Ex	<	-	>						<	-				-	>		
			Avail.	<	-	>						<	-				-	>		
	6 - Pearl Street & Pine Street	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	8	>	8	
			V/C	<	0.05	>		<	0.05	>		<	0.11	>		<	0.13	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	7 - Martha Street & James Street	TWSC	LOS		A	A	A		A		A			B	B	Approach Not Applicable				
			Delay		0	0	0		0		0			12	12					
			V/C		0.28	0.02			0.19					0.17						
			Q		0	0			0					5						
			Ex		-	-			-					-						
			Avail.		-	-			-					-						
	8 - Martha Street & James Street/New Street	TCS	LOS		B		B		A	A	A	Approach Not Applicable				B		B	B	B
			Delay		15		15		10	8	9					15		15	15	13
			V/C		0.31				0.33	0.05						0.02		0.00		0.30
			Q		25				17	5						4		1		
			Ex		-				-	-						15		-		
			Avail.		-				-	-						11		-		
	9 - Martha Street & Site Driveway	TWSC	LOS	Approach Not Applicable				<	A	>	A		A	>	A	<	A		A	
			Delay					<	10	>	10		0	>	0	<	0		0	
			V/C					<	0.04	>			0.10	>		<	0.00			
			Q					<	1	>			0	>		<	0			
			Ex					<	-	>			-	>		<	-			
			Avail.					<	-	>			-	>		<	-			

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

TABLE 5.2B: 2027 TOTAL 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 - Lakeshore Road & Brant Street	TCS	LOS	E	C	>	E	B	C	>	C	<	C	>	C	D	D	>	D	D
			Delay	65	21	>	61	13	28	>	28	<	33	>	33	50	50	>	50	44
			V/C	0.95	1.01	>		0.03	0.86	>		<	0.05	>		0.74	0.76	>		0.93
			Q	97	315	>		2	235	>		<	8	>		73	89	>		
			Ex	55	-	>		25	-	>		<	-	>		-	15	>		
			Avail.	-42	-	>		23	-	>		<	-	>		-	-74	>		
	2 - Lakeshore Road & Elizabeth Street	TCS	LOS	A	B	>	B	A	A	>	A	<	D	>	D	D	D	>	D	B
			Delay	6	11	>	11	6	6	>	6	<	46	>	46	43	40	>	41	11
			V/C	0.23	0.85	>		0.23	0.52	>		<	0.52	>		0.32	0.07	>		0.72
			Q	10	323	>		9	78	>		<	38	>		21	12	>		
			Ex	-	-	>		25	-	>		<	-	>		20	-	>		
			Avail.	-	-	>		16	-	>		<	-	>		-1	-	>		
	3 - Lakeshore Road & Old Lakeshore Road/Pearl Street	TCS	LOS	A	A	>	A	A	A	>	A	<	D	>	D	D	D	>	D	A
			Delay	2	5	>	5	2	3	>	3	<	49	>	49	48	45	>	46	7
			V/C	0.17	0.80	>		0.01	0.49	>		<	0.42	>		0.34	0.07	>		0.67
			Q	6	241	>		1	55	>		<	23	>		19	14	>		
			Ex	40	-	>		20	-	>		<	-	>		15	-	>		
			Avail.	34	-	>		19	-	>		<	-	>		-4	-	>		
	4 - Lakeshore Road & Martha Street	TWSC	LOS	B	A		A		A	>	A	Approach Not Applicable				<	E	>	E	
			Delay	14	0		2		0	>	0					<	44	>	44	
			V/C	0.46	0.51				0.75	>						<	0.44	>		
			Q	19	0				0	>						<	16	>		
			Ex	15	-				-	>						<	-	>		
			Avail.	-4	-				-	>						<	-	>		
	5 - Martha Street & Pine Street	TWSC	LOS	<	B	>	A	Approach Not Applicable				<	A		A		A	>	A	
			Delay	<	12	>	10					<	1		1		0	>	0	
			V/C	<	0.17	>						<	0.02				0.03	>		
			Q	<	3	>						<	0				0	>		
			Ex	<	-	>						<	-				-	>		
			Avail.	<	-	>						<	-				-	>		
	6 - Pearl Street & Pine Street	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	8	>	8	
			V/C	<	0.08	>		<	0.07	>		<	0.14	>		<	0.22	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	7 - Martha Street & James Street	TWSC	LOS		A	A	A		A		A			B	B	Approach Not Applicable				
			Delay		0	0	0		0		0			12	12					
			V/C		0.23	0.02			0.53					0.17						
			Q		0	0			0					7						
			Ex		-	-			-					-						
			Avail.		-	-			-					-						
	8 - Martha Street & James Street/New Street	TCS	LOS		A		A		A	A	A	Approach Not Applicable				D		D	D	A
			Delay		2		2		3	1	2					41		40	41	2
			V/C		0.33				0.55	0.07						0.18		0.00		0.53
			Q		26				63	4						6		2		
			Ex		-				-	-						15		-		
			Avail.		-				-	-						9		-		
	9 - Martha Street & Site Driveway	TWSC	LOS	Approach Not Applicable				<	A	>	B		A	>	A	<	A		A	
			Delay					<	10	>	12		0	>	0	<	2		1	
			V/C					<	0.02	>			0.11	>		<	0.01			
			Q					<	1	>			0	>		<	0			
			Ex					<	-	>			-	>		<	-			
			Avail.					<	-	>			-	>		<	-			

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

Q - 95th Percentile Queue Length (m)
Ex. - Existing Available Storage (m)
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TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

<- Shared Left/Through Lane
>- Shared Right/Through Lane

5.3 Site Distance Evaluation

Paradigm conducted a sight distance evaluation for the proposed driveway connections in accordance with guidelines provided by the Transportation Association of Canada (TAC)[9]. Sight distance considerations are divided into three categories:

Stopping Sight Distance (SSD) is the distance required for a vehicle to perceive, react and come to a complete stop to avoid colliding with an object in the road. In this respect, SSD can be considered as the minimum standard visibility criterion for the safe operation of an unsignalized intersection.

Decision Sight Distance (DSD) is the distance required for a vehicle to perceive, react and select an appropriate speed and path, and initiate and complete the movement to avoid the hazard. In this respect, DSD can be considered as the preferred visibility criterion for the safe operation of an unsignalized intersection.

Turning Sight Distance (TSD) is based on the time required for perception, reaction and completion of the desired critical exiting maneuver (typically, a left turn) once the driver on a minor street approach (or a driveway) decides to execute the maneuver. Calculations for TSD include the time to: (1) turn left, clearing the on-coming traffic lanes, without conflicting with the vehicles approaching from the left; and (2) upon turning left, to accelerate to the operating speed on the roadway without causing vehicles traveling in the same direction on the road to unduly reduce their speed. In this context, TSD can be considered as a desirable visibility criterion for the safe operation of an unsignalized intersection.

Paradigm generally uses a design speed of 10 kilometres per hour over the posted speed limit in urban environments to provide a conservative analysis. Since this is a driveway connection as opposed to a new municipal roadway, typically the minimum stopping sight distance should be provided.

Table 5.3 summarizes the minimum sight distance requirements for a 60 kilometre per hour design speed (10 kilometres per hour over the posted speed limit). These standards are based on the TAC design guide.

[9] Transportation Association of Canada – Geometric Design Guide for Canadian Roads, 2017.

TABLE 5.3: SIGHT DISTANCE REQUIREMENTS

Sight Distance	Design Speed 60 km/h
Minimum Stopping Sight Distance (m)	85
Minimum Decision Sight Distance (m)	205
Minimum Turning Sight Distance (m)	130

Sight distance observations based on aerial imagery and a field visit indicate that the stopping sight distance for the Site Driveway is sufficient as the roadways are relatively flat and straight with the field of view unobstructed for at least 140 metres in either direction.

6 Remedial Measures

As summarized in the analysis tables in the preceding chapter, minimal delay is projected at the study area intersections. The analysis also concludes that the development would have minimal impacts on traffic operations in the study area.

This chapter includes a summary of potential remedial measures that may be required to address the limited impacts of the development and to improve existing deficiencies.

6.1 Brant Street and Lakeshore Road

The intersection of Lakeshore Road and Brant Street presently operates at an overall LOS D and LOS B during the weekday AM and PM peak hours, respectively. The development is expected to add only 16 vehicles in the AM peak hour and 17 vehicles in the PM peak hour to Lakeshore Road (a less than 1% increase in the total traffic on Lakeshore Road). Comparing the 2027 background operations to the 2027 total operations shows an increase in overall delay of 1 second (from 59 seconds to 60 seconds) and an equivalent v/c ratio of 1.01 between the two scenarios. It is evident that this level of additional traffic will not change the overall operations of the intersection.

Regardless of the development's minimal impacts at this location, remedial measures appear to be appropriate.

As a general guideline, the lane capacity of an arterial lane is about 900 vehicles per hour. Currently, along Lakeshore Road, the peak hour, peak direction traffic volumes exceed 900 vehicles per hour in both directions, exceeding the capacity of a single lane. Accounting for background traffic growth, this volume is expected to increase to approximately 1,050-1,200 vehicles per hour (with variations in peak period and east/west direction), further exacerbating the operational issues.

Due to the high levels of existing congestion at the intersection and the expected future growth in population and employment for Burlington, improvements to the intersection could be continually required. However, widening existing roads or building new ones typically encroaches on private property, impacts mature trees and green space or compromises the existing public realm (e.g. sidewalks, boulevards). A more sustainable transportation strategy is to invest in moving more people per kilometre through walking, cycling and/or transit. By focusing on shifting commuter travel to active transportation modes or public transit, intersection operations could maintain the status quo (capacity conditions during peak hours) or even improve.

To accommodate future travel, not just at the intersection of Brant Street and Lakeshore Road, but for travel to, from and within the downtown, a full-spectrum multi-modal transportation system, implemented over time, is required. For the time being, an interim improvement option could be to optimize the intersection signal timing cycle length for both peak hours.

A sensitivity analysis has been undertaken using the 2027 total traffic forecasts with optimized signal timings. The analysis indicates that the intersection of Lakeshore Road and Brant Street is projected to operate with improved operations during the weekday AM and PM peak hours.

Table 6.1 summarizes the results of the sensitivity analysis. **Appendix H** contains the detailed Synchro reports and signal timings.

TABLE 6.1: SENSITIVITY ANALYSIS

Analysis Period	Intersection	Control Type	Horizon	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	Lakeshore Road & Brant Street	TCS	2027 Total	LOS	C	F	>	**F**	B	B	>	**B**	<	C	>	**C**	C	C	>	**C**	**E**
				Delay	23	121	>	**104**	12	12	>	**12**	<	26	>	**26**	32	27	>	**29**	**60**
				V/C	0.81	1.21	>		0.57	0.57	>		<	0.03	>		0.55	0.16	>		**1.01**
				Q	46	361	>		1	83	>		<	5	>		41	17	>		
				Ex	55	-	>		25	-	>		<	-	>		-	15	>		
				Avail.	9	-	>		24	-	>		<	-	>		-	-2	>		
		TCS	2027 Total (optimized)	LOS	C	C	>	**C**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**C**
				Delay	35	29	>	**30**	4	7	>	**7**	<	39	>	**39**	50	41	>	**45**	**23**
				V/C	0.84	0.95	>		0.01	0.45	>		<	0.04	>		0.63	0.20	>		**0.88**
				Q	115	408	>		1	71	>		<	6	>		57	24	>		
				Ex	55	-	>		25	-	>		<	-	>		-	15	>		
				Avail.	-60	-	>		24	-	>		<	-	>		-	-9	>		
PM Peak Hour	Lakeshore Road & Brant Street	TCS	2027 Total	LOS	E	C	>	**E**	B	C	>	**C**	<	C	>	**C**	D	D	>	**D**	**D**
				Delay	65	21	>	**61**	13	28	>	**28**	<	33	>	**33**	50	50	>	**50**	**44**
				V/C	0.95	1.01	>		0.03	0.86	>		<	0.05	>		0.74	0.76	>		**0.93**
				Q	97	315	>		2	235	>		<	8	>		73	89	>		
				Ex	55	-	>		25	-	>		<	-	>		-	15	>		
				Avail.	-42	-	>		23	-	>		<	-	>		-	-74	>		
		TCS	2027 Total (optimized)	LOS	E	D	>	**D**	B	C	>	**C**	<	D	>	**D**	E	E	>	**E**	**D**
				Delay	62	51	>	**53**	13	28	>	**28**	<	38	>	**38**	58	57	>	**57**	**42**
				V/C	0.89	0.85	>		0.02	0.84	>		<	0.06	>		0.78	0.78	>		**0.92**
				Q	95	323	>		2	78	>		<	9	>		81	104	>		
				Ex	55	-	>		25	-	>		<	-	>		-	15	>		
				Avail.	-40	-	>		23	-	>		<	-	>		-	-89	>		

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

6.2 Martha Street and Site Driveway

Left-turn lane warrant analysis was conducted to determine if the projected traffic volumes warrant installation of a northbound left-turn lane on Martha Street at the Site Driveway. The left-turn lane warrants follow the requirements in the Ministry of Transportation's (MTO) Design Supplement[10].

A design speed of 60 kilometres per hour (10 kilometres per hour over the posted speed limit) was used along with the 2027 total traffic forecasts on Martha Street. Both the AM and PM peak hours were assessed. Based on the warrants, a southbound left-turn lane is not warranted. The left turn lane warrant nomographs are attached in **Appendix I**.

[10] MTO Design Supplement for TAC Geometric Design Guide for Canadian Road, June 2017.

7 Parking Assessment

A four-level underground parking garage with 160 parking stalls for residents is provided in addition to seven (7) visitor surface parking spaces. In total 167 parking stalls are proposed. Build out is anticipated to occur in one phase at or before 2022.

7.1 Zoning By-Law Requirements

Zoning By-law 2020 is the current in-force By-law for the City of Burlington. The requirements stipulated in the Zoning By-law (ZBL) are outlined in **Appendix J.** Based on the ZBL, the subject site is zoned as Downtown High Density Residential which requires site specific parking rates for residential use.

Table 6.1 summarizes Burlington's ZBL minimum parking standard calculations for the development.

TABLE 7.1: ZONING BY-LAW REQUIREMENTS

Parking Space Use	Units	Zoning By-Law 2020	
		Parking Rate	Parking Spaces Required
Residential	130	1.00 spaces per unit	130
Visitor Spaces	130	0.25 spaces per unit	33
Total Parking Required			**163**

Overall, the development program is supplying 167 spaces in total exceeding the overall supply requirements, however of the 167 spaces, 7 spaces are only provided for visitor use.

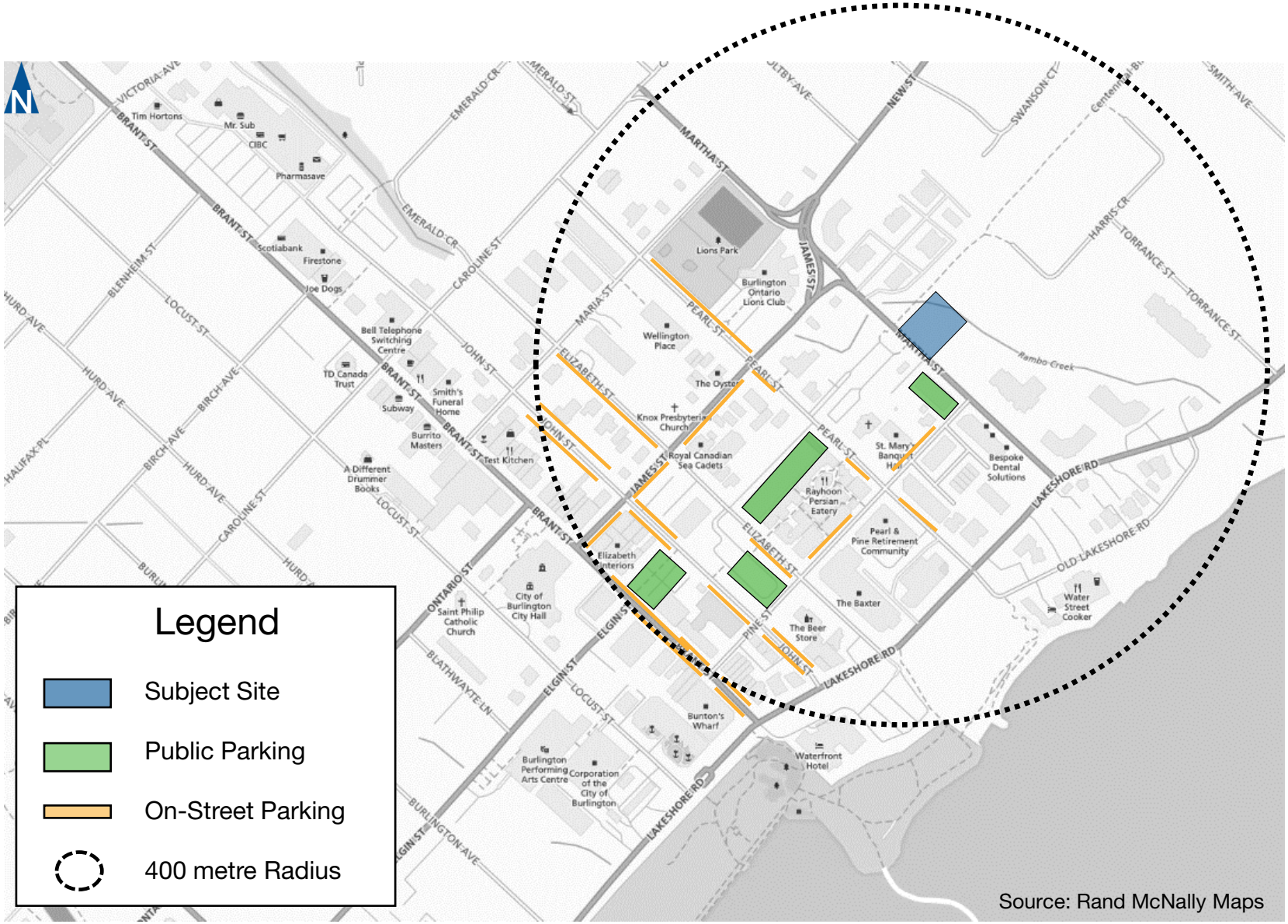
7.2 Visitor Parking Supply

As outlined in **Table 6.1**, the City's ZBL requirement for visitor parking is 0.25 spaces per unit, or 33 visitor spaces for the subject site. There are 7 visitor parking spaces (0.05 spaces per unit) proposed for the development. This is 26 fewer spaces than is required by the City's ZBL.

By limiting the parking supply to focus primarily on residential needs, the development provides incentive to change and shape the travel choices of visitors to the site.

In the event that visitors are unable to use sustainable mode choices there are at least 4 publicly accessible parking lots and on-street parking located within a 400-metre radius, or 5-minute walk, from the development. These parking lots and on-street parking areas provide approximately 300 public parking spaces to visitors of the site.

Additionally, the impact to this public parking supply is expected to be minimal; up to 26 off-site parking spaces (or 9% of the total supply) would be needed during peak periods according to the City's ZBL requirement. **Figure 6.1** illustrates the public parking areas in relation to the proposed development.



Local Area Public Parking Facilities

Figure 7.1

7.2.1 2011 Downtown Parking Study

MMM Group conducted a parking study for the City of Burlington in September 2011.[11] that assessed the Downtown parking supply and the parking demand. The study analyzed municipal parking lots/garages, privately owned public parking lots/garages, privately operated parking lots/garages, and on-street parking spaces to determine the total Downtown supply.

The result of this study found that there was a large surplus of capacity in the Downtown area as the peak parking utilization was only 60% during the weekday morning and afternoon and that parking demand during the evening was found to be around 44%. This study also noted that peak demand within the Brant Street and Elizabeth Street lots occurred during evening hours, after typical PM peak hour roadway times, with a peak utilization around 93% and is noted to be inconsistent with other peak times within the Downtown.

It is understood that some of these off-site parking lots may be developed and replaced with infill developments. Given the previously mentioned Downtown public parking surplus for the majority of the day and that residential developments are expected to have off-peak parking demands, the redevelopment of some of these parking areas will not have a significant impact on the overall availability of parking for visitors of the proposed development.

Nevertheless, the MMM Group study has recommended that the City investigate the feasibility of providing additional parking garages to address the possibility of infill developments. The preferred proposed location of this additional parking is at the intersection of Elizabeth Street and Pine Street. This added parking is within walking distance of the development and provides further justification and support for limited on-site visitor parking facilities.

7.2.2 2015 Downtown Limited Survey

To ensure the results presented in the 2011 Downtown Parking Study conducted by MMM Group are still relevant, a 2015 comprehensive parking study conducted by Paradigm was reviewed.[12]. The utilization survey included surface parking lots, structured parking, metered on-street parking and non-metered on-street parking within the area bounded by Brant Street to the west, James Street to the north, Martha

[11] City of Burlington Downton Parking Study, Prepared for City of Burlington by MMM Group dated September 2011.

[12] 141970 - 374 Martha Street (Downtown Burlington) Parking Study, Prepared by Paradigm dated January 2015.



Street to the east and Lakeshore Road to the south. **Appendix K** contains the survey data.

A review of the parking utilization study determined the following information from the studied parking areas:

- **Weekday Morning (9:00 AM to 12:00 PM)**
  - Occupancy range of 33% to 68%;
  - Average occupancy of 57%;
  - 85th Percentile occupancy of 80%;
  - 85th Percentile parking space availability of 32%.
- **Weekday Afternoon (12:00 PM to 6:00 PM)**
  - Occupancy range of 60 to 79%;
  - Average occupancy of 67%;
  - 85th Percentile occupancy of 76%;
  - 85th Percentile parking space availability of 24%.
- **Weekday Evening (6:00 PM to 10:00 PM)**
  - Peak weekday occupancy occurs between 6:20 PM and 7:20 PM;
  - Peak weekday occupancy range of 79% to 83%;
  - Peak weekday average occupancy of 81%.
  - Parking accumulation decreased after 7:00 PM;

During weekdays, parking activity at off-site lots and on-street spaces within the survey area typically peaked at 7:00 PM and then gradually decreased towards 9:00 PM. This is noted to be consistent with the findings in the 2011 Downtown parking study for this area. In 2011, the peak utilization at the Brant Street and Elizabeth lots is noted to be 10% higher than the observations made in the 2015 study. However, this variance could be because of the time of year the study was conducted; the 2015 study was completed in November, whereas the 2011 study was completed in June.

Although, as stated in the 2015 study, the capacity in the lots within the immediate vicinity of the development are expected to peak during evening hours, visitors of the site will be able to access parking in other facilities less than 100 metres walking distance from the site. This 2011 Downtown parking study further supports this observation:

"peak parking demands related to individual off-street parking facilities were observed to occur at different times during the survey day and off-street parking is generally available within walking distance to any Downtown destination at any time of the day."[13]

7.2.3 Other Jurisdictions

It is beneficial to look further at parking rates from other jurisdictions to those found in Zoning By-law 2020 to provide further insight to potential reductions in parking that are more in-line with typical downtown conditions. **Table 7.2** outlines visitor parking rates from three other jurisdictions.

TABLE 7.2: OTHER JURISDICTION PARKING RATES

Jurisdiction	Parking Space Type	Parking Rate
City of Toronto	Visitor	0.10 spaces per unit
City of Vaughan	Visitor	0.15 spaces per unit
City of Hamilton	Visitor	N/A

Standards for visitor parking in the assessed Canadian municipalities vary. This comparison provides further evidence that many municipalities are gravitating towards lower standards for residential visitor parking rates. For example, Hamilton is using new draft standards which include no visitor parking provisions. These trends reflect a recognition that sustainable travel options are having an impact on parking rates.

7.3 Bicycle Parking

The City's Zoning By-Law does not require bicycle parking for residential developments. The development, however, is proposing to supply a total of 88 bicycle parking spaces, comprising 82 indoor spaces and 6 outdoor spaces.

[13] City of Burlington Downtown Parking Study, prepared by MMM Group dated September 2011.

7.4 Summary of Parking Demand

The proposed site provides a total of 167 parking spaces (160 spaces for residential use and 7 spaces for visitor use) which equates to a parking ratio of 1.28 parking spaces per unit. The existing parking requirement for the development under the City of Burlington's ZBL is 163 parking spaces. This means that the development is proposing to provide an overall surplus of 5 parking spaces.

The proposed visitor parking supply equates to a rate of 0.05 spaces per unit, or 7 spaces for the development. The City's ZBL requirement indicates that 33 visitor spaces, a rate of 0.25 spaces per unit, are required.

Overall, as the development does not meet the on-site visitor parking supply as prescribed in the ZBL, the impact to the publicly available parking supply is expected to be minimal as up to 26 off-site parking spaces could be utilized for visitor use.

Two parking studies conducted on Downtown Burlington's public parking supply determined that the capacity of lots within the immediate vicinity of the subject site are expected to peak during evening hours. Despite this, adjacent lots and on-street parking spaces, less than 100-metres away from the subject site, are anticipated to have available spaces for visitor parking use.

As the area is well served, from a transit perspective, and permanent public parking facilities are in the area, justification for a reduced visitor requirement should be granted. As the primary purpose of off-site public parking facilities is to provide short-stay parking for visitors to the area, the use of these spaces for visitors of the development will not have a negative impact on the surrounding neighborhood.

Although not required, the development is proposing to supply a total of 88 bicycle parking spaces, comprising 82 indoor spaces and 6 outdoor spaces.

Furthermore, as a surplus of parking supply is proposed for the residential component, (i.e. exceeding the requirements under the ZBL), 26 of these spaces could technically be assigned for visitor use. To accommodate this, access control equipment for the parking garage would need to be relocated to parking level one to create additional visitor spaces within a "nested" area while still providing a gated area for residential parking.

This is not seen as a requirement at this time based on the analysis contained herein, however is one potential option to create additional visitor spaces on-site that would meet the ZBL requirements.

8 Transportation Demand Management

Transportation Demand Management (TDM) refers to ways of making the capacity of our roads more efficient by reducing vehicle demand. TDM approaches consider how people's choices of travel mode are affected by land use patterns, development design, parking availability, parking cost, and the relative cost, convenience and availability of alternative modes of travel. Various TDM strategies are used to influence those factors so that the alternatives are more competitive with driving alone and can potentially reduce reliance on motor vehicles.

TDM strategies at a development can be divided into two basic categories.

- Pre-occupancy: things that need to be done while a development is being designed and built, and
- Post-occupancy: things that can be done once people are using the development.

The pre-occupancy actions are critical because they are most likely to determine how attractive, convenient, and safe alternative travel modes will be once the site is occupied. Before a site is occupied, or during a remodel/ renovation, it can be designed to be convenient and safe for pedestrians and cyclists, and vehicle parking can be provided to meet but not exceed demand.

After the development is built, incentives can be offered, but those incentives will not work as well if the site and its surroundings are oriented to motor vehicles. The incentives generally include subsidies to use transit or rideshare and information about where and how to use alternatives.

TDM is one of the tools that municipalities are using to create a more vibrant and sustainable community.

8.1 Commitment

The applicant is encouraged to commit to a robust and comprehensive TDM plan for the development. It is a significant investment and demonstrates their commitment to meet the City's transportation goals for the site.

8.1.1 Factors for Success

For the overall TDM plan to be successful, a number of factors are important. The plan must leverage and use the current and proposed transportation infrastructure. The plan should also be actionable through a set of strategies that are operationally and financially realistic.

It is also important to consider, not just the individual TDM strategies, but how theses strategies complement each other in a combined effort; The plan is designed with the understanding that each strategy is needed to maximize trip reductions.

8.1.2 Approach

The TDM plan should be structured to mitigate potential traffic and parking impacts. To provide the most successful implementation, the strategies outlined herein detail strategies the applicant can use to provide a seamless level of service for residents and employees while supporting large City objectives and policies.

The strategies fall into four basic categories that are outlined in the following sections: Multimodal Infrastructure, Management and Marketing, Site Specific Strategies and Parking Management.

8.2 Multimodal Infrastructure

The development of new residential housing results in investment in new bicycle and pedestrian infrastructure. These investments are expected to improve transportation access and connectivity within the development and to the rest of Burlington. Most importantly, it is these infrastructure investments which will enable the TDM strategies to be successful in achieving a reduction in automobile trips.

8.2.1 Walking

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 to enhance the overall pedestrian experience.

Due to the site's proximity to commercial/office neighborhoods within an established urban area, walking is encouraged by the provision of a pedestrian-friendly site layout. This layout includes an extensive network of sidewalks and entrances at key points both within the site and connecting to the existing pedestrian network. The layout also opens the majority of the site to public pedestrian access by providing 4 street level entrances to Martha Street. This allows for an enhanced pedestrian experience for visitors and residents of the development. The on-site pedestrian network will also provide direct access to several transit stops and various municipal parking areas located within immediate vicinity of the site.

By taking advantage of the public sidewalk to attract and serve pedestrians with multiple connections the development offers walkability as one of the key design features.

8.2.2 Cycling

Increasing bicycling to, from and within Burlington is a key strategy to reducing vehicle trips. The number of people bicycling is directly related to the quality of the bicycling network and presence of bicycling facilities; more people will cycle if there is better infrastructure and connectivity to do so.

As outlined in **sub-section 2.3.2**, the City's 2016 Cycling Map identifies Brant Street, Martha Street, Pine Street and Pearl Street as signed bicycle routes. Additionally, Lakeshore Road has a bike lane from Brant Street west to Maple Avenue.

A review of the City's Draft Cycling Master Plan (2019) has identified Brant Street and Caroline Street as proposed Bicycle Priority Streets. Additionally, bike lanes are proposed on Elgin Street and Lakeshore Road east of Brant Street. As a result, the site has the potential to be well served by bicycle infrastructure.

8.2.3 Secure Bicycle Parking

Even a small chance of bicycle theft can be enough of a reason for an individual to choose another mode of transport. As a result, it is important to that the development provide adequate and appropriate bicycle parking options so that cyclists can feel comfortable leaving their bicycle for extended periods of time.

The City's Zoning By-Law does not require bicycle parking for residential developments. Even so, the development is proposing to supply a total of 88 bicycle parking spaces; 82 indoor spaces and 6 outdoor spaces.

With the proposed bicycle parking spaces, residents and visitors are more likely to choose to travel to/from the site by cycling. This increase in sustainable transportation helps to create a reduction of automobile trips resulting in a reduction in vehicle parking demand.

8.2.4 Transit

Transit within the study area is currently served by six routes operated by BT. The 2016 TTS data identified that 9% of residents within the study area use transit as a mode of travel (**sub-section 3.2.2**).

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.

8.3 Management and Marketing

Effective marketing and management of the TDM plan are essential to its success. If residents and the general public are unaware of the available transportation options and strategies, they will not take advantage of them.

8.3.1 TDM Coordinator

The condominium board/property manager should oversee site-related transportation demand management and act as the site's TDM Coordinator. The person (or persons) in this role is responsible for coordinating with other parties within the site to help reduce single-occupant motor vehicle travel to and from the site.

To that end, the TDM strategies identified in this section are suggested to be implemented under the direction and supervision of the TDM Coordinator. The duties of the TDM Coordinator include but are not limited to:

- disseminating information on alternate modes of transportation and developing related marketing materials;
- developing and implementing appropriate TDM strategies; and
- monitoring the effectiveness of those strategies.

8.3.2 Transportation Information

The TDM Coordinator should develop marketing/informational materials as part of their initial scope of work. Information on transportation options and/or links to the appropriate website should be provided to all prospective residents as a component of the welcome packages. The materials should include schedules for local and regional transit services, bicycle and trail networks and the location of retail and recreational establishments.

8.3.3 Ride Share

Ride-share involves two or more people sharing a vehicle for a trip. The cost of the journey (fuel, tolls, parking, etc.) can be split between the driver and passengers, resulting in savings for all concerned. Promotion of ride-share ultimately results in a reduction in vehicle trips and parking demands.

There are several tools available such as Car Pool World, which allow the establishment of a site-specific online ride sharing database. This enables people to enter their journeys so that the database can

automatically search out residents or employees whose journeys match.

Notice boards are recommended to be put up in the building lobbies and at the tenant's office to raise awareness of the database and for residents to organize informal carpools as well.

8.4 Site Specific Strategies

This section describes the TDM strategies the applicant should consider implementing as part of the development. Since some of these strategies will require coordination and input of the TDM Coordinator and City of Burlington, the exact parameters of a given measure may evolve over time or be determined at a future date.

8.4.1 On-Site Bicycle Repair Facilities

Providing basic tools for keeping bicycles in good working order can encourage residents and commuters to try biking and keep them riding. Bicycle repair facilities, such as hand tools and an air compressor for tires, are a small investment that can make a big difference.

At a minimum, a repair facility should be located within the underground parking garage for use by residents and a secondary facility should be located adjacent to the outdoor bicycle parking spaces for use by visitors.

8.4.2 Car Sharing Program

Car sharing programs are services that provide members with access to a fleet of vehicles, usually on an hourly basis. It is an increasingly effective way of encouraging people to reconsider purchasing a car, or in some cases acquiring a second car. Success of car sharing programs relies on having cars in conveniently located areas with parking spaces allocated directly to the service.

The TDM plan will need to include a car-share vehicle funded through the condominium corporation/property manager. Ideally, the location of the car-share vehicle parking space would be in a highly visible and accessible parking space in a municipal lot within walking distance of the site. The rationale behind this is that if the vehicle were to be parked in the underground parking garage, users of the car-share vehicle would be limited to the development rather than the overall community.

8.5 Parking Management

Sufficient automobile parking is necessary for the development to be successful. However, too much parking can encourage traffic congestion, limit the ability to meet trip reduction goals, increase project costs, and impact site design and aesthetics. Finding the right balance needed to support Burlington's trip reduction goals is critical, particularly, given that parking is an expensive resource. If free and unregulated parking is provided, there is little incentive for residents and visitors to use alternative modes of transportation.

The parking management strategy presented in this section is designed to help ensure there are enough parking spaces to support the site, while avoiding an over abundance of parking supply.

8.5.1 Parking Supply

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. At the same time, the uses proposed on the site require a certain amount of base parking supply in order to be successful. Per the current development plan, 167 parking spaces are provided for the 130 residential units resulting in a parking rate of 1.28 spaces per unit. This rate is noted to be greater than the parking demand observed at two proxy sites located within Downtown Burlington. A reduction in the proposed parking supply to be consistent with nearby developments will help to maintain, or could even shift, the existing travel mode share.

8.5.2 Unbundled Parking for Residents

Unbundling parking is one of the most effective TDM strategies for encouraging alternative travel habits. To further encourage residents to choose sustainable travel modes, the development is proposing to sell parking spaces separately from the cost of a unit. This is more equitable and efficient since occupants are not forced to pay for parking and allows consumers to adjust their parking supply to reflect their needs.

8.6 TDM Summary

A TDM plan is recommended to be developed and implemented for prospective residents. The plan should leverage multimodal infrastructure, management and marketing, site specific conditions and parking supply to enhance residents' ability to travel without the use of an automobile, thereby reducing the need for residents to own one.

Existing and planned factors or strategies that reduce the need for residents of the subject site to own a private vehicle include:

- convenient access to transportation alternatives, including public transit and bicycle networks;
- a wide range of employment, retail, activity centres and amenities located nearby;
- the provision of an extensive network of sidewalks and entrances at key points both within the site and connecting to the existing pedestrian network;
- provision of 4 street level entrances to Martha Street opening the majority of the site to convenient public pedestrian access;
- provision of 88 bicycle parking spaces; 82 indoor spaces and 6 outdoor spaces; and
- unbundling parking from the sale of the residential units.

Potential strategies that the development could incorporate into the site to further reduce single occupancy vehicle travel/ownership include:

- the provision of a TDM coordinator whose duties could include:
  - disseminating information on alternate modes of transportation and developing related marketing materials;
  - developing and implementing appropriate TDM strategies; and
  - monitoring the effectiveness of those strategies.
- the establishment of a site-specific ride-share database;
- the provision of bicycle repair facilities;
- the provision of a car-share vehicle within walking distance of the subject site; and
- a reduction in the proposed parking supply to be consistent with nearby developments.

Balancing these factors should help achieve trip reduction goals, reduce development costs, and support the success of a pedestrian friendly development. Details of the TDM plan will be further refined as part of a subsequent site plan application.

9 Conclusions and Recommendations

9.1 Conclusions

Transportation

The study evaluated existing conditions, the impacts of background traffic growth and projected the impacts of the development with the construction of 130 residential units.

Vehicular access to the site is proposed via one all movements driveway connection to Martha Street, located approximately 175 metres north of the intersection of Lakeshore Road and Martha Street (centreline to centreline). Full build-out of the development is projected to generate 40 new trips during the AM peak hour and 43 new vehicle trips during the PM peak hour.

Detailed traffic analysis was conducted for each of the study area intersections under 2020 base conditions and 2027 background and total conditions. The traffic analysis conducted as part of this assessment indicates that development volumes will only result in minor increases to the surrounding study area intersection volumes under peak conditions which should not be perceptible. It is acknowledged that capacity constraints at the Lakeshore Road and Brant Street in intersection is presently occurring and are expected to further deteriorate with anticipated growth in traffic, independent of the proposed development. To address these deficiencies the following mitigation measures are recommended to be implemented by the City:

- **Lakeshore Road at Brant Street:** The City's transportation system will need to provide capacity through a combination of measures to encourage alternative modes of transportation, including active transportation and TDM and increased transit usage to provide for a better balance of mode choice for the overall transportation network. Until this occurs, an interim improvement option could be to optimize the intersection signal timings with an increased cycle length. A sensitivity analysis has been undertaken for the Total traffic conditions and indicates the intersection would operate with improved operations.

A left turn lane warrant analysis was conducted along Martha Street at the Site Driveway and found that a left-turn lane is not warranted to service development traffic.

Overall, the study determined that the site generated traffic should not have a significant impact on traffic operations within the study area and the existing transportation infrastructure in the area, can adequately

accommodate the traffic volumes projected to be generated by the proposed development.

Parking

The results of the methodologies used in the parking analysis provide a general understanding of parking behaviour. The parking analysis conducted indicates that the proposed supply of 1.23 parking spaces per unit (160 parking spaces) meets the City's ZBL requirements. However, the proposed visitor parking supply of 0.05 spaces per unit is not met.

The impact to the publicly available parking supply is expected to be minimal as up to 26 off-site parking spaces could be utilized for visitor use. As the area is well served, from a transit perspective, and permanent public parking facilities are in the area, justification for a reduced visitor requirement should be granted. As the primary purpose of off-site public parking facilities is to provide short-stay parking for visitors to the area, the use of these spaces for visitors of the development will not have a negative impact on the surrounding neighborhood.

Furthermore, as a surplus of parking supply is proposed for the residential component, (i.e. exceeding the requirements under the ZBL), 26 of these spaces could technically be assigned for visitor use. To accommodate this, access control equipment for the parking garage would need to be relocated to parking level one to create additional visitor spaces within a "nested" area while still providing a gated area for residential parking. This is not seen as a requirement at this time based on the analysis contained herein, however is one potential option to create additional visitor spaces on-site that would meet the ZBL requirements.

Transportation Demand Management (TDM)

To further promote the site as a sustainable development a variety of transportation demand management measures (TDM) to reduce parking demand is recommended to be incorporated. The TDM plan will focus on making the site a model of sustainable transportation by promoting alternative modes of transportation over the use of private automobiles. The plan calls for implementation of a comprehensive suite of strategies aimed at reducing the need for vehicle ownership.



9.2 Recommendations

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

- The proposed Site Driveway operate with a single inbound and outbound travel lane with stop control provided for the east leg;
- The City of Burlington support the proposed parking supply of 160 residential parking spaces (1.23 spaces per unit) and 7 visitor parking spaces(0.05 parking spaces per unit); and
- To promote alternative modes of transportation and further reduce the risk attached to reduced parking ratios, the owner develop and implement a TDM plan.

Appendix A

Terms of Reference



Adam Makarewicz

Subject: RE: 401 Martha Street

Adam J. Makarewicz, Dipl.T., C.E.T. MITE
Senior Project Manager

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e: amakarewicz@ptsl.com
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From: **Zunic, John** <John.Zunic@burlington.ca>
Date: Tue, Sep 19, 2017 at 10:41 AM
Subject: RE: 401-417 Martha Street -- Traffic Operations scope of work

Please see my comments below, in red, regarding the proposed scope of work for the TIS for 401-417 Martha Street.

Additionally, the Halton Region Transportation Impact Study Guidelines can be found here:
http://www.halton.ca/living_in_halton/roads_transportation/development_impacts/

Please let me know if you have any questions.

Thanks,

John Zunic

Transportation Planning Technologist

Transportation Services Department, City of Burlington

426 Brant Street, Burlington, Ontario L7R 3Z6

tel. 905-335-7600 ext. 7691

john.zunic@burlington.ca

Please consider the environment before printing this e-mail.

Scope of Work re: Parking and Traffic

TASKS – PARKING (limited scope)

1. Confirm ZONING BYLAW PARKING requirements of prevailing Burlington zoning bylaw and apply those standards to the proposed development.

2. Report on conformity of the proposed parking supply to the bylaw requirements.

TASKS - TRAFFIC

3. Independent of the Paradigm report, forecast site-generated traffic based upon a combination of: i) anticipated parking supply, ii) TTS travel characteristics (persons per household, labour force participation, auto mode split, etc.), iii) Institute of Transportation Engineers (ITE) trip generation rates and iv) nearby condominium observed rates.

Please confirm with Transportation Planning staff the condominium buildings intended for observation.

4. Adopt the existing and forecast future background volumes presented in the Paradigm report for 374 Martha Street for the following intersections: Lakeshore Road and Brant Street; Lakeshore Road and Elizabeth Street; Lakeshore Road and Pearl Street; Lakeshore Road and Martha Street; Martha Street and Pine Street; James Street and Martha Street; Pine Street and Pearl Street; and New Street and Martha Street

5. Adjust the Paradigm existing and future background traffic flows to 2017 / 2022 by applying appropriate growth rate factors (the City will accept a 1% annual growth rate), and confirm the acceptance of this approach with the municipality

6. Establish an appropriate directional distribution of site-generated traffic based upon TTS origins and destination data of area residents, together with observed directional distribution of the nearby condominiums and confirm or refute Paradigm directional distribution

7. Undertake video-based counts at the unsignalized intersections of Martha-Pine Streets and Martha Lake Shore – 7-9 am and 4-6pm on a weekday -- from which "gap" (turning movement opportunity capacity) and queue studies can be undertaken from the video.

8. Confirm validity of adjustment factor used in 5 above by actual 2017 counts.

9. Obtain (from City, if available) more recent counts of the above-listed (Counts are available for purchase from the City.)

10. Obtain from the municipality other nearby proposed development that might add to future background traffic levels and obtain (if available) traffic studies prepared by others for those developments. (Nearby proposed developments are publicly available on the City's website.)

11. Obtain agreement from the municipality / Region on an appropriate growth rate for non-local background traffic. (The City is willing to accept a 1% annual growth rate.)

12. Update the following three traffic flow scenarios through the above-listed intersections and site access: i) existing, ii) future background (including 374 Martha), iii) future background plus site-generated traffic

13. Undertake intersection (gap) capacity and queue analyses under existing conditions and adjust for future background and future background plus site-generated traffic for the Martha Street and Lakeshore Road.

14. Update the operational performance of the above-listed intersections for the above three traffic flow scenarios.

Provide Transportation Demand Management (TDM) recommendations. (The City will be looking for rigorous set of TDM recommendations, including but not limited to secure and at-grade bicycle parking, car share spaces and vehicles on site, an extensive pedestrian network, etc.)

Appendix B

Turning Movement Count Data



Lakeshore Rd @ Brant St

Morning Peak Diagram

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

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

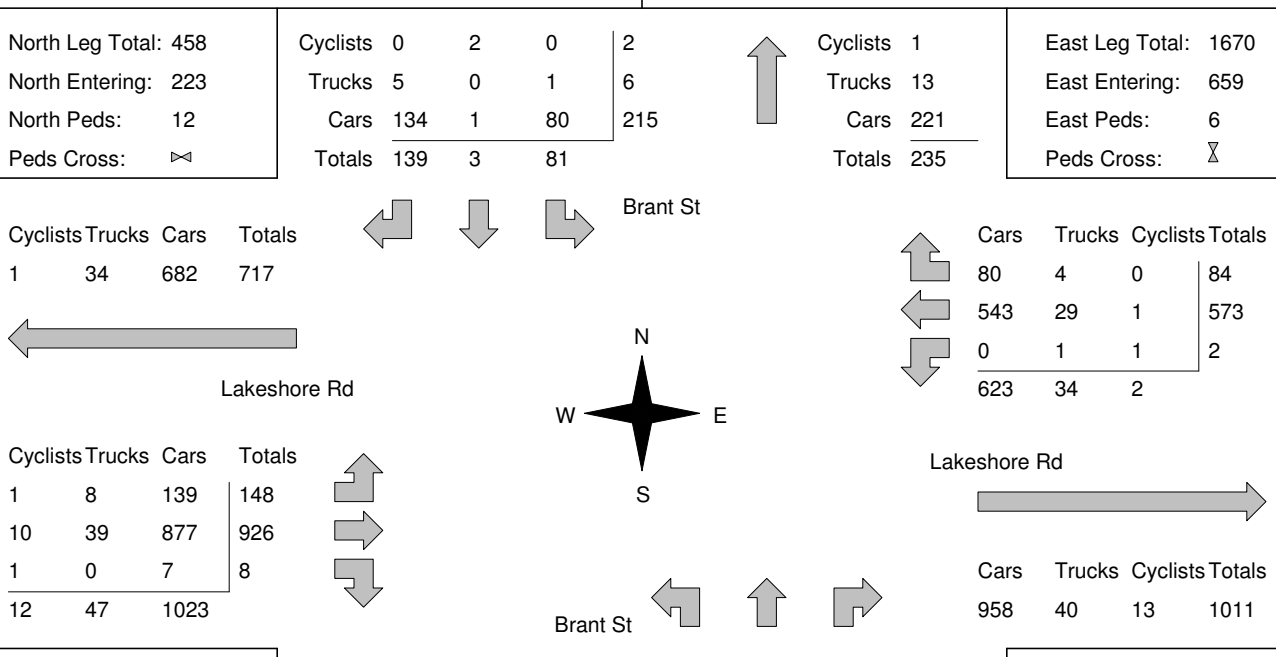
Municipality: Burlington
Site #: 0000200266
Intersection: Lakeshore Rd & Brant St
TFR File #: 1
Count date: 24-Apr-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E



Comments

Lakeshore Rd @ Brant St

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 #: 0000200266
Intersection: Lakeshore Rd & Brant St
TFR File #: 1
Count date: 24-Apr-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E

North Leg Total:	603
North Entering:	315
North Peds:	25
Peds Cross:	⋈

Cyclists	0	2	0	2
Trucks	9	0	1	10
Cars	201	1	101	303
Totals	210	3	102	

Cyclists	5
Trucks	8
Cars	275
Totals	288

East Leg Total:	1293
East Entering:	679
East Peds:	23
Peds Cross:	⧖

Cyclists	Trucks	Cars	Totals
8	34	751	793

Brant St

Cars	Trucks	Cyclists	Totals
94	2	0	96
545	25	8	578
1	0	4	5
640	27	12	

Lakeshore Rd

N
W E
S

Cyclists	Trucks	Cars	Totals
1	6	181	188
4	26	482	512
1	0	3	4
6	32	666	

Lakeshore Rd

Cars	Trucks	Cyclists	Totals
583	27	4	614

Brant St

Peds Cross:	⧖
West Peds:	26
West Entering:	704
West Leg Total:	1497

Cars	5
Trucks	0
Cyclists	7
Totals	12

Cars	5	0	0	5
Trucks	0	0	0	0
Cyclists	0	4	0	4
Totals	5	4	0	

Peds Cross:	⋈
South Peds:	30
South Entering:	9
South Leg Total:	21

Comments

Lakeshore Rd @ Brant St

Afternoon Peak Diagram

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

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

Municipality: Burlington
Site #: 0000200266
Intersection: Lakeshore Rd & Brant St
TFR File #: 1
Count date: 24-Apr-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E

North Leg Total:	628
North Entering:	376
North Peds:	28
Peds Cross:	⋈

Cyclists	0	3	1	4
Trucks	6	0	7	13
Cars	264	6	89	359
Totals	270	9	97	

Cyclists	6
Trucks	3
Cars	243
Totals	252

East Leg Total:	1857
East Entering:	1119
East Peds:	7
Peds Cross:	⧖

Brant St

Cyclists	Trucks	Cars	Totals
10	40	1249	1299

Cars	Trucks	Cyclists	Totals
88	2	2	92
980	34	10	1024
2	0	1	3
1070	36	13	

Lakeshore Rd

N
W E
S

Cyclists	Trucks	Cars	Totals
1	1	151	153
8	17	616	641
0	0	14	14
9	18	781	

Lakeshore Rd

Cars	Trucks	Cyclists	Totals
705	24	9	738

Brant St

Peds Cross:	⧖
West Peds:	31
West Entering:	808
West Leg Total:	2107

Cars	22
Trucks	0
Cyclists	4
Totals	26

Cars	5	4	0	9
Trucks	0	0	0	0
Cyclists	0	3	0	3
Totals	5	7	0	

Peds Cross:	⋈
South Peds:	49
South Entering:	12
South Leg Total:	38

Comments

Lakeshore Rd @ Brant St

Total Count Diagram

Municipality: Burlington
Site #: 0000200266
Intersection: Lakeshore Rd & Brant St
TFR File #: 1
Count date: 24-Apr-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E

North Leg Total:	4422
North Entering:	2425
North Peds:	214
Peds Cross:	⋈

Cyclists	7	14	2	23
Trucks	44	0	24	68
Cars	1645	23	666	2334
Totals	1696	37	692	

Cyclists	25
Trucks	55
Cars	1917
Totals	1997

East Leg Total:	12116
East Entering:	6295
East Peds:	152
Peds Cross:	⧖

Brant St

Cyclists	Trucks	Cars	Totals
45	243	6979	7267

Cars	Trucks	Cyclists	Totals
712	27	5	744
5293	199	38	5530
10	1	10	21
6015	227	53	

Lakeshore Rd

N
W E
S

Cyclists	Trucks	Cars	Totals
6	27	1188	1221
51	189	4883	5123
3	0	61	64
60	216	6132	

Lakeshore Rd

Cars	Trucks	Cyclists	Totals
5552	213	56	5821

Brant St

Peds Cross:	⧖
West Peds:	160
West Entering:	6408
West Leg Total:	13675

Cars	94
Trucks	1
Cyclists	27
Totals	122

Cars	41	17	3	61
Trucks	0	1	0	1
Cyclists	0	14	3	17
Totals	41	32	6	

Peds Cross:	⋈
South Peds:	246
South Entering:	79
South Leg Total:	201

Comments

Lakeshore Rd @ Brant St
Traffic Count Summary

Intersection: Lakeshore Rd & Brant St | **Count Date:** 24-Apr-2018 | **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	55	0	122	177	8	191
9:00:00	81	3	139	223	12	235
11:00:00	0	0	0	0	0	0
12:00:00	83	5	244	332	23	334
13:00:00	102	3	210	315	25	324
14:00:00	94	3	199	296	42	301
15:00:00	0	0	0	0	0	0
16:00:00	93	6	259	358	53	376
17:00:00	97	9	270	376	28	388
18:00:00	87	8	253	348	23	355
Totals:	692	37	1696	2425	214	2504

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	7	7	0	14	16
9:00:00	5	3	4	12	10
11:00:00	0	0	0	0	0
12:00:00	2	0	0	2	28
13:00:00	5	4	0	9	30
14:00:00	3	2	0	5	47
15:00:00	0	0	0	0	0
16:00:00	11	6	1	18	45
17:00:00	5	7	0	12	49
18:00:00	3	3	1	7	21
Totals:	41	32	6	79	246

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	1	473	40	514	1	1491
9:00:00	2	573	84	659	6	1741
11:00:00	0	0	0	0	0	0
12:00:00	1	510	86	597	20	1265
13:00:00	5	578	96	679	23	1383
14:00:00	2	578	126	706	37	1401
15:00:00	0	0	0	0	0	0
16:00:00	1	882	110	993	43	1732
17:00:00	3	1024	92	1119	7	1927
18:00:00	6	912	110	1028	15	1763
Totals:	21	5530	744	6295	152	12703

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	122	849	6	977	8
9:00:00	148	926	8	1082	1
11:00:00	0	0	0	0	0
12:00:00	135	528	5	668	26
13:00:00	188	512	4	704	26
14:00:00	169	522	4	695	26
15:00:00	0	0	0	0	0
16:00:00	150	576	13	739	28
17:00:00	153	641	14	808	31
18:00:00	156	569	10	735	14
Totals:	1221	5123	64	6408	160

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:	78	96	136	160	163	181	149	127

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Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: James Street & Martha Street
Site Code:
Start Date: 06/12/2018

Turning Movement Data

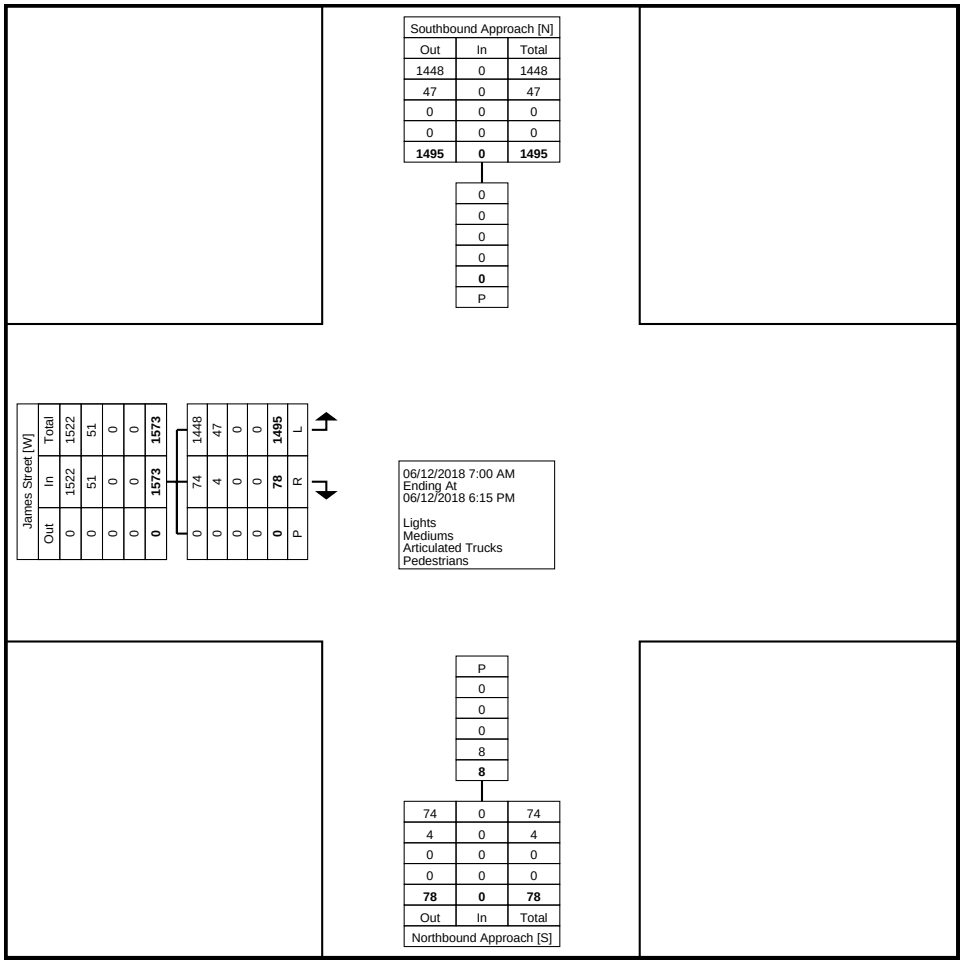
Start Time	James Street Eastbound				Northbound Approach Northbound		Southbound Approach Southbound		
	Left	Right	Peds	App. Total	Peds	App. Total	Peds	App. Total	Int. Total
7:00 AM	77	1	0	78	0	0	0	0	78
7:15 AM	86	2	0	88	0	0	0	0	88
7:30 AM	102	2	0	104	0	0	0	0	104
7:45 AM	104	6	0	110	0	0	0	0	110
Hourly Total	369	11	0	380	0	0	0	0	380
8:00 AM	81	5	0	86	0	0	0	0	86
8:15 AM	93	2	0	95	0	0	0	0	95
8:30 AM	63	3	0	66	0	0	0	0	66
8:45 AM	76	4	0	80	0	0	0	0	80
Hourly Total	313	14	0	327	0	0	0	0	327
9:00 AM	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0
3:00 PM	58	7	0	65	0	0	0	0	65
3:15 PM	53	6	0	59	0	0	0	0	59
3:30 PM	60	5	0	65	1	0	0	0	65
3:45 PM	56	2	0	58	1	0	0	0	58
Hourly Total	227	20	0	247	2	0	0	0	247
4:00 PM	71	5	0	76	1	0	0	0	76
4:15 PM	70	7	0	77	1	0	0	0	77
4:30 PM	80	4	0	84	1	0	0	0	84
4:45 PM	86	5	0	91	2	0	0	0	91
Hourly Total	307	21	0	328	5	0	0	0	328
5:00 PM	87	3	0	90	1	0	0	0	90
5:15 PM	69	4	0	73	0	0	0	0	73
5:30 PM	53	3	0	56	0	0	0	0	56
5:45 PM	70	2	0	72	0	0	0	0	72
Hourly Total	279	12	0	291	1	0	0	0	291
6:00 PM	0	0	0	0	0	0	0	0	0
Grand Total	1495	78	0	1573	8	0	0	0	1573
Approach %	95.0	5.0	-	-	-	-	-	-	-
Total %	95.0	5.0	-	100.0	-	0.0	-	0.0	-
Lights	1448	74	-	1522	-	0	-	0	1522
% Lights	96.9	94.9	-	96.8	-	-	-	-	96.8
Mediums	47	4	-	51	-	0	-	0	51
% Mediums	3.1	5.1	-	3.2	-	-	-	-	3.2
Articulated Trucks	0	0	-	0	-	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	-	-	-	-	0.0

Pedestrians	-	-	0	-	8	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-

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Count Name: James Street & Martha Street
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Turning Movement Data Plot

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Count Name: James Street & Martha Street
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Start Date: 06/12/2018

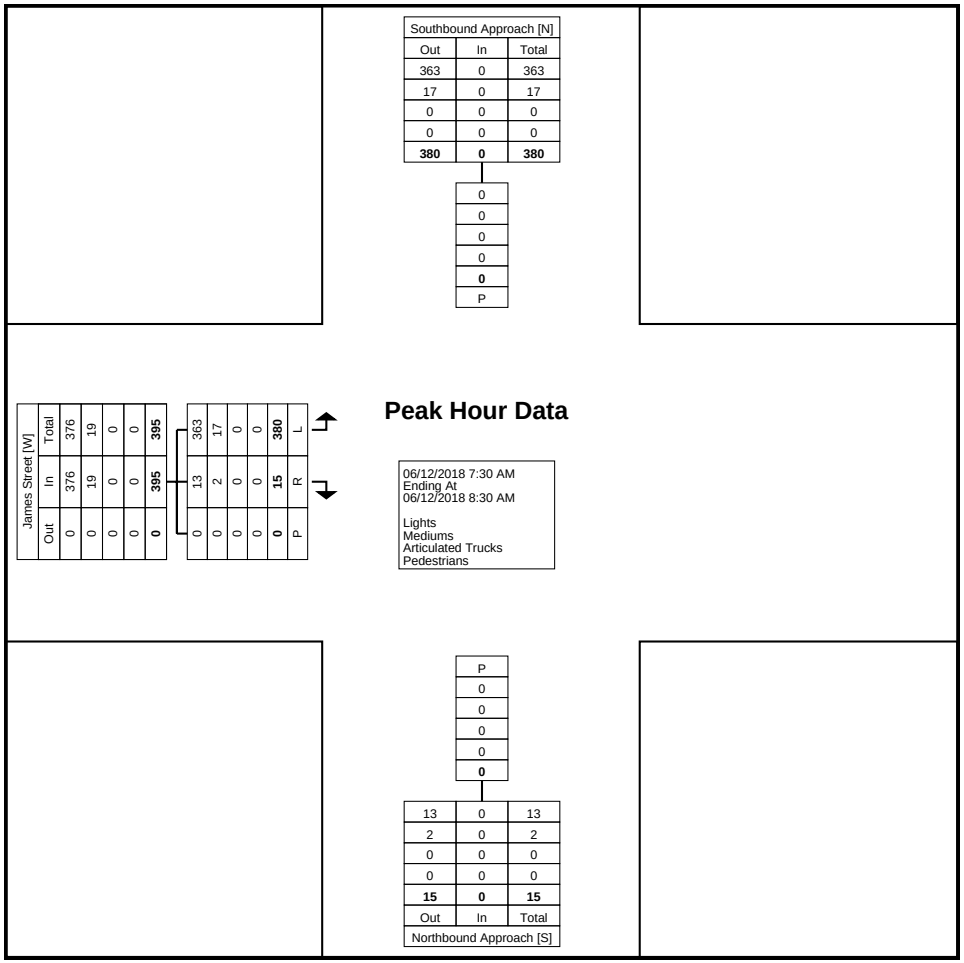
Turning Movement Peak Hour Data (7:30 AM)

Start Time	James Street Eastbound				Northbound Approach Northbound		Southbound Approach Southbound		
	Left	Right	Peds	App. Total	Peds	App. Total	Peds	App. Total	Int. Total
7:30 AM	102	2	0	104	0	0	0	0	104
7:45 AM	104	6	0	110	0	0	0	0	110
8:00 AM	81	5	0	86	0	0	0	0	86
8:15 AM	93	2	0	95	0	0	0	0	95
Total	380	15	0	395	0	0	0	0	395
Approach %	96.2	3.8	-	-	-	-	-	-	-
Total %	96.2	3.8	-	100.0	-	0.0	-	0.0	-
PHF	0.913	0.625	-	0.898	-	0.000	-	0.000	0.898
Lights	363	13	-	376	-	0	-	0	376
% Lights	95.5	86.7	-	95.2	-	-	-	-	95.2
Mediums	17	2	-	19	-	0	-	0	19
% Mediums	4.5	13.3	-	4.8	-	-	-	-	4.8
Articulated Trucks	0	0	-	0	-	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	-	-	-	-	0.0
Pedestrians	-	-	0	-	0	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-

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Count Name: James Street & Martha Street
Site Code:
Start Date: 06/12/2018



Turning Movement Peak Hour Data Plot (7:30 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: James Street & Martha Street
Site Code:
Start Date: 06/12/2018

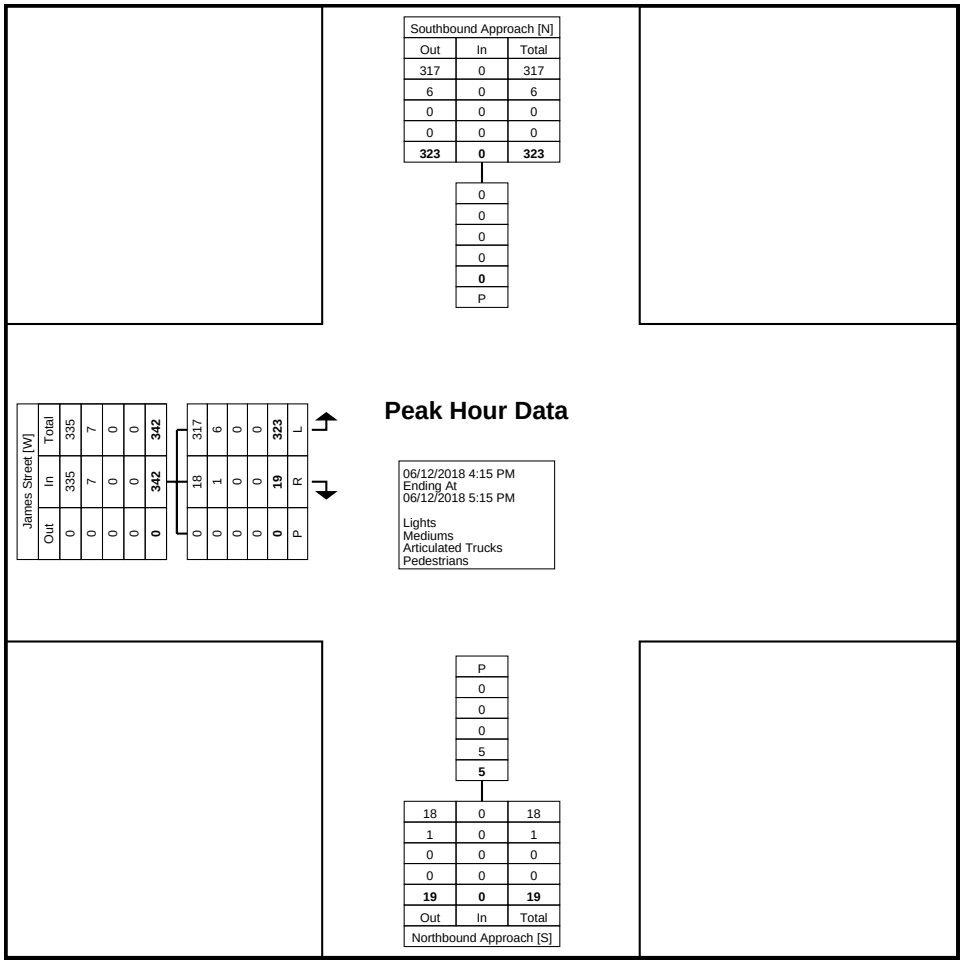
Turning Movement Peak Hour Data (4:15 PM)

Start Time	James Street Eastbound				Northbound Approach Northbound		Southbound Approach Southbound		
	Left	Right	Peds	App. Total	Peds	App. Total	Peds	App. Total	Int. Total
4:15 PM	70	7	0	77	1	0	0	0	77
4:30 PM	80	4	0	84	1	0	0	0	84
4:45 PM	86	5	0	91	2	0	0	0	91
5:00 PM	87	3	0	90	1	0	0	0	90
Total	323	19	0	342	5	0	0	0	342
Approach %	94.4	5.6	-	-	-	-	-	-	-
Total %	94.4	5.6	-	100.0	-	0.0	-	0.0	-
PHF	0.928	0.679	-	0.940	-	0.000	-	0.000	0.940
Lights	317	18	-	335	-	0	-	0	335
% Lights	98.1	94.7	-	98.0	-	-	-	-	98.0
Mediums	6	1	-	7	-	0	-	0	7
% Mediums	1.9	5.3	-	2.0	-	-	-	-	2.0
Articulated Trucks	0	0	-	0	-	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	-	-	-	-	0.0
Pedestrians	-	-	0	-	5	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-

Paradigm Transportation Solutions Limited
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Count Name: James Street & Martha Street
Site Code:
Start Date: 06/12/2018



Turning Movement Peak Hour Data Plot (4:15 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: James Street & Martha Street
Site Code:
Start Date: 06/12/2018

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Elizabeth Street
Site Code: 200116
Start Date: 03/03/2020

Turning Movement Data

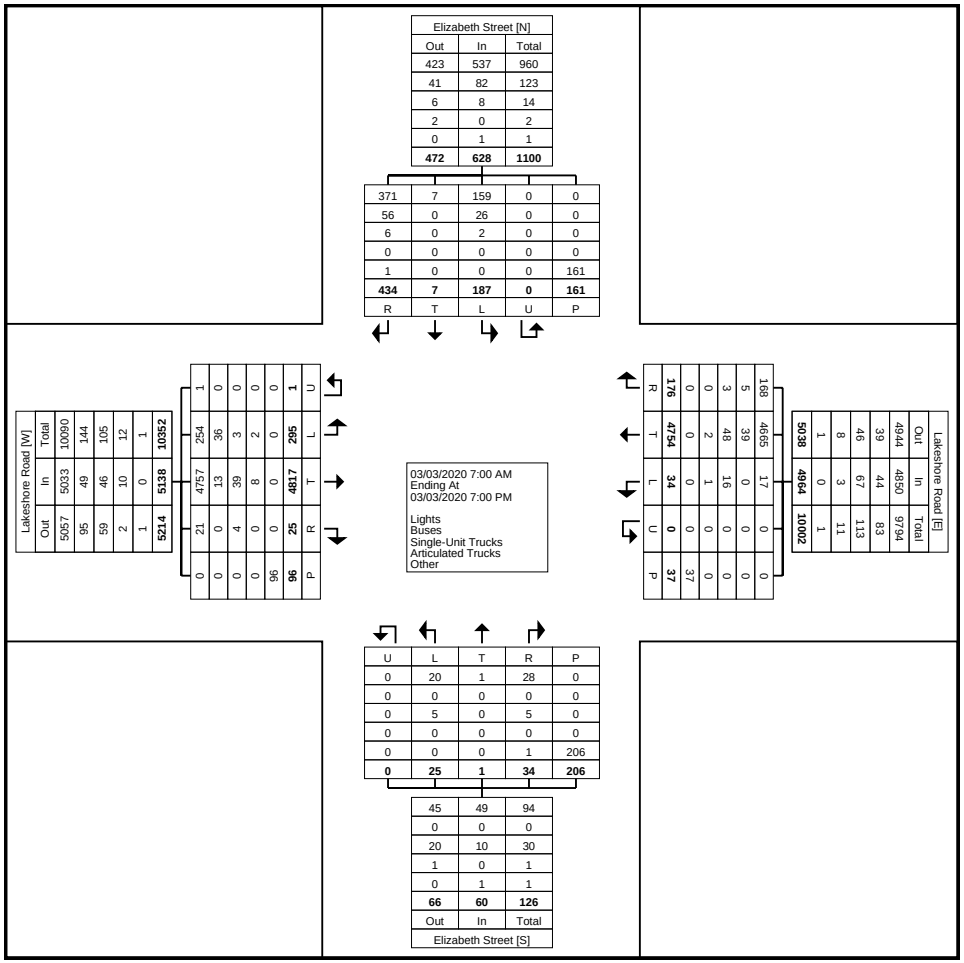
Start Time	Lakeshore Road Eastbound						Lakeshore Road Westbound						Elizabeth Street Northbound						Elizabeth Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	1	174	1	0	0	176	0	72	1	0	1	73	0	0	0	0	13	0	1	0	6	0	2	7	256
7:15 AM	5	219	2	0	0	226	3	94	0	0	0	97	1	0	4	0	6	5	4	0	5	0	2	9	337
7:30 AM	3	228	0	0	0	231	1	109	1	0	0	111	0	0	1	0	10	1	3	1	5	0	4	9	352
7:45 AM	4	233	1	0	1	238	3	121	2	0	0	126	0	0	3	0	15	3	3	0	8	0	2	11	378
Hourly Total	13	854	4	0	1	871	7	396	4	0	1	407	1	0	8	0	44	9	11	1	24	0	10	36	1323
8:00 AM	6	250	0	0	3	256	2	147	1	0	0	150	1	0	1	0	4	2	3	0	11	0	5	14	422
8:15 AM	14	215	2	0	0	231	5	137	4	0	0	146	0	0	2	0	1	2	5	1	9	0	3	15	394
8:30 AM	15	198	2	0	3	215	5	152	3	0	0	160	2	0	2	0	1	4	2	0	10	0	6	12	391
8:45 AM	9	164	0	0	7	173	4	118	5	0	0	127	2	0	2	0	0	4	6	0	6	0	8	12	316
Hourly Total	44	827	4	0	13	875	16	554	13	0	0	583	5	0	7	0	6	12	16	1	36	0	22	53	1523
9:00 AM	7	162	1	0	2	170	0	111	4	0	0	115	1	0	1	0	6	2	5	2	10	0	5	17	304
9:15 AM	6	126	1	0	0	133	0	102	2	0	0	104	0	0	0	0	22	0	3	0	7	0	6	10	247
9:30 AM	9	137	1	0	2	147	0	115	1	0	2	116	1	0	1	0	7	2	5	1	9	0	11	15	280
9:45 AM	12	123	1	0	0	136	1	105	3	0	1	109	2	0	1	0	12	3	1	0	9	0	5	10	258
Hourly Total	34	548	4	0	4	586	1	433	10	0	3	444	4	0	3	0	47	7	14	3	35	0	27	52	1089
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	5	119	0	0	0	124	0	144	7	0	2	151	2	0	0	0	0	2	5	1	13	0	8	19	296
11:45 AM	11	132	2	1	10	146	0	117	8	0	1	125	0	1	0	0	11	1	5	0	14	0	4	19	291
Hourly Total	16	251	2	1	10	270	0	261	15	0	3	276	2	1	0	0	11	3	10	1	27	0	12	38	587
12:00 PM	11	115	1	0	6	127	1	102	9	0	4	112	1	0	1	0	14	2	4	1	18	0	6	23	264
12:15 PM	13	120	1	0	9	134	0	114	9	0	1	123	1	0	1	0	10	2	11	0	15	0	3	26	285
12:30 PM	9	121	0	0	5	130	1	139	11	0	5	151	1	0	4	0	9	5	4	0	17	0	8	21	307
12:45 PM	9	122	2	0	5	133	1	137	7	0	2	145	0	0	1	0	7	1	4	0	10	0	10	14	293
Hourly Total	42	478	4	0	25	524	3	492	36	0	12	531	3	0	7	0	40	10	23	1	60	0	27	84	1149
1:00 PM	6	105	2	0	11	113	1	115	7	0	2	123	2	0	2	0	11	4	7	0	20	0	9	27	267
1:15 PM	9	120	0	0	3	129	2	109	11	0	0	122	0	0	2	0	2	2	10	0	16	0	9	26	279
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	15	225	2	0	14	242	3	224	18	0	2	245	2	0	4	0	13	6	17	0	36	0	18	53	546
4:00 PM	14	158	1	0	0	173	1	235	7	0	2	243	2	0	1	0	6	3	14	0	23	0	1	37	456
4:15 PM	10	170	0	0	3	180	0	258	6	0	1	264	3	0	0	0	4	3	10	0	17	0	2	27	474
4:30 PM	8	139	0	0	3	147	0	259	5	0	0	264	0	0	0	0	1	0	5	0	18	0	0	23	434
4:45 PM	9	171	1	0	2	181	1	224	8	0	0	233	1	0	0	0	7	1	10	0	16	0	1	26	441
Hourly Total	41	638	2	0	8	681	2	976	26	0	3	1004	6	0	1	0	18	7	39	0	74	0	4	113	1805
5:00 PM	11	150	0	0	4	161	0	235	8	0	3	243	0	0	0	0	11	0	8	0	21	0	1	29	433
5:15 PM	15	162	0	0	3	177	0	258	11	0	0	269	0	0	0	0	5	0	8	0	24	0	2	32	478

5:30 PM	16	152	0	0	4	168	0	234	13	0	2	247	0	0	0	0	2	0	7	0	28	0	11	35	450
5:45 PM	9	139	0	0	0	148	2	199	3	0	2	204	1	0	0	0	3	1	7	0	17	0	4	24	377
Hourly Total	51	603	0	0	11	654	2	926	35	0	7	963	1	0	0	0	21	1	30	0	90	0	18	120	1738
6:00 PM	10	102	1	0	5	113	0	158	7	0	1	165	0	0	2	0	1	2	5	0	13	0	6	18	298
6:15 PM	13	96	0	0	2	109	0	119	6	0	5	125	0	0	0	0	5	0	9	0	14	0	10	23	257
6:30 PM	8	100	0	0	1	108	0	120	2	0	0	122	0	0	0	0	0	0	9	0	9	0	4	18	248
6:45 PM	8	95	2	0	2	105	0	95	4	0	0	99	1	0	2	0	0	3	4	0	16	0	3	20	227
Hourly Total	39	393	3	0	10	435	0	492	19	0	6	511	1	0	4	0	6	5	27	0	52	0	23	79	1030
Grand Total	295	4817	25	1	96	5138	34	4754	176	0	37	4964	25	1	34	0	206	60	187	7	434	0	161	628	10790
Approach %	5.7	93.8	0.5	0.0	-	-	0.7	95.8	3.5	0.0	-	-	41.7	1.7	56.7	0.0	-	-	29.8	1.1	69.1	0.0	-	-	-
Total %	2.7	44.6	0.2	0.0	-	47.6	0.3	44.1	1.6	0.0	-	46.0	0.2	0.0	0.3	0.0	-	0.6	1.7	0.1	4.0	0.0	-	5.8	-
Lights	254	4757	21	1	-	5033	17	4665	168	0	-	4850	20	1	28	0	-	49	159	7	371	0	-	537	10469
% Lights	86.1	98.8	84.0	100.0	-	98.0	50.0	98.1	95.5	-	-	97.7	80.0	100.0	82.4	-	-	81.7	85.0	100.0	85.5	-	-	85.5	97.0
Buses	36	13	0	0	-	49	0	39	5	0	-	44	0	0	0	0	-	0	26	0	56	0	-	82	175
% Buses	12.2	0.3	0.0	0.0	-	1.0	0.0	0.8	2.8	-	-	0.9	0.0	0.0	0.0	-	-	0.0	13.9	0.0	12.9	-	-	13.1	1.6
Single-Unit Trucks	3	39	4	0	-	46	16	48	3	0	-	67	5	0	5	0	-	10	2	0	6	0	-	8	131
% Single-Unit Trucks	1.0	0.8	16.0	0.0	-	0.9	47.1	1.0	1.7	-	-	1.3	20.0	0.0	14.7	-	-	16.7	1.1	0.0	1.4	-	-	1.3	1.2
Articulated Trucks	2	8	0	0	-	10	1	2	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	13
% Articulated Trucks	0.7	0.2	0.0	0.0	-	0.2	2.9	0.0	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	0	0	1	0	-	1	2
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	2.9	-	-	1.7	0.0	0.0	0.2	-	-	0.2	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	4	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	2.5	-	-
Pedestrians	-	-	-	-	96	-	-	-	-	-	37	-	-	-	-	-	206	-	-	-	-	-	157	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	97.5	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Elizabeth Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Elizabeth Street
Site Code: 200116
Start Date: 03/03/2020

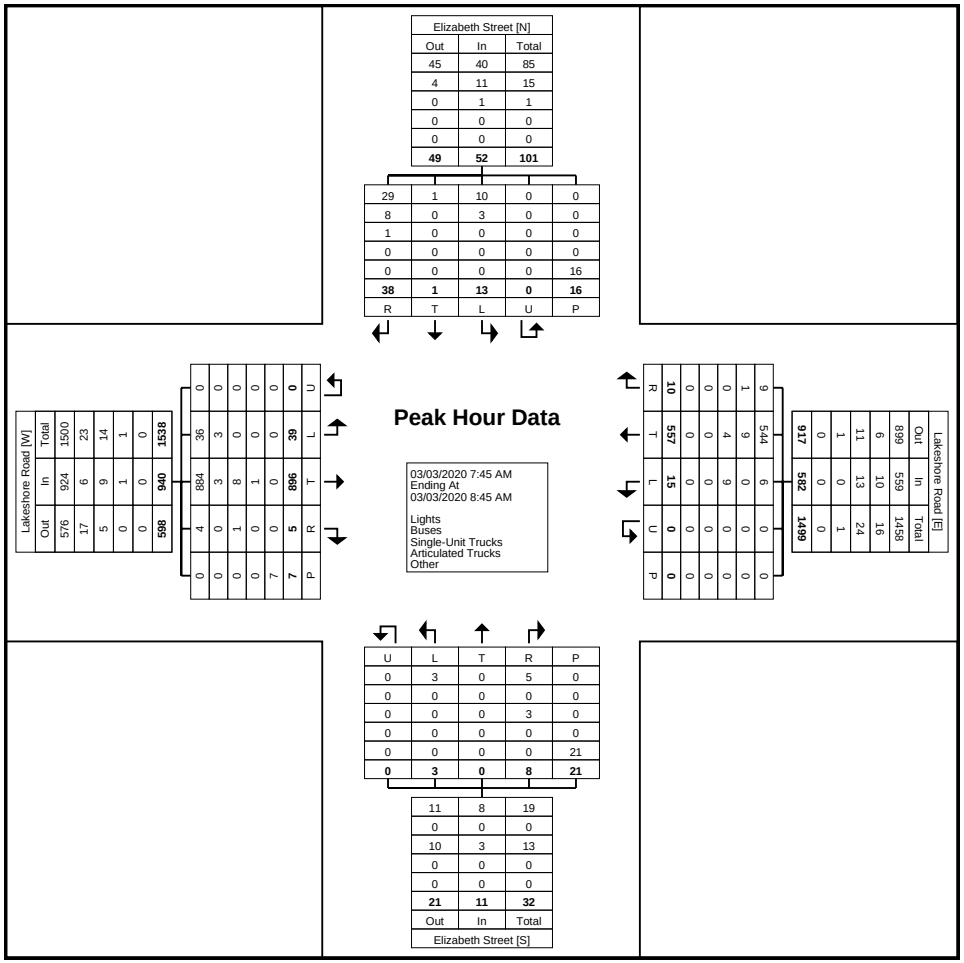
Turning Movement Peak Hour Data (7:45 AM)

Start Time	Lakeshore Road Eastbound						Lakeshore Road Westbound						Elizabeth Street Northbound						Elizabeth Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:45 AM	4	233	1	0	1	238	3	121	2	0	0	126	0	0	3	0	15	3	3	0	8	0	2	11	378
8:00 AM	6	250	0	0	3	256	2	147	1	0	0	150	1	0	1	0	4	2	3	0	11	0	5	14	422
8:15 AM	14	215	2	0	0	231	5	137	4	0	0	146	0	0	2	0	1	2	5	1	9	0	3	15	394
8:30 AM	15	198	2	0	3	215	5	152	3	0	0	160	2	0	2	0	1	4	2	0	10	0	6	12	391
Total	39	896	5	0	7	940	15	557	10	0	0	582	3	0	8	0	21	11	13	1	38	0	16	52	1585
Approach %	4.1	95.3	0.5	0.0	-	-	2.6	95.7	1.7	0.0	-	-	27.3	0.0	72.7	0.0	-	-	25.0	1.9	73.1	0.0	-	-	-
Total %	2.5	56.5	0.3	0.0	-	59.3	0.9	35.1	0.6	0.0	-	36.7	0.2	0.0	0.5	0.0	-	0.7	0.8	0.1	2.4	0.0	-	3.3	-
PHF	0.650	0.896	0.625	0.000	-	0.918	0.750	0.916	0.625	0.000	-	0.909	0.375	0.000	0.667	0.000	-	0.688	0.650	0.250	0.864	0.000	-	0.867	0.939
Lights	36	884	4	0	-	924	6	544	9	0	-	559	3	0	5	0	-	8	10	1	29	0	-	40	1531
% Lights	92.3	98.7	80.0	-	-	98.3	40.0	97.7	90.0	-	-	96.0	100.0	-	62.5	-	-	72.7	76.9	100.0	76.3	-	-	76.9	96.6
Buses	3	3	0	0	-	6	0	9	1	0	-	10	0	0	0	0	-	0	3	0	8	0	-	11	27
% Buses	7.7	0.3	0.0	-	-	0.6	0.0	1.6	10.0	-	-	1.7	0.0	-	0.0	-	-	0.0	23.1	0.0	21.1	-	-	21.2	1.7
Single-Unit Trucks	0	8	1	0	-	9	9	4	0	0	-	13	0	0	3	0	-	3	0	0	1	0	-	1	26
% Single-Unit Trucks	0.0	0.9	20.0	-	-	1.0	60.0	0.7	0.0	-	-	2.2	0.0	-	37.5	-	-	27.3	0.0	0.0	2.6	-	-	1.9	1.6
Articulated Trucks	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	7	-	-	-	-	-	0	-	-	-	-	-	21	-	-	-	-	-	16	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Elizabeth Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Elizabeth Street
Site Code: 200116
Start Date: 03/03/2020

Turning Movement Peak Hour Data (12:15 PM)

Start Time	Lakeshore Road Eastbound						Lakeshore Road Westbound						Elizabeth Street Northbound						Elizabeth Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:15 PM	13	120	1	0	9	134	0	114	9	0	1	123	1	0	1	0	10	2	11	0	15	0	3	26	285
12:30 PM	9	121	0	0	5	130	1	139	11	0	5	151	1	0	4	0	9	5	4	0	17	0	8	21	307
12:45 PM	9	122	2	0	5	133	1	137	7	0	2	145	0	0	1	0	7	1	4	0	10	0	10	14	293
1:00 PM	6	105	2	0	11	113	1	115	7	0	2	123	2	0	2	0	11	4	7	0	20	0	9	27	267
Total	37	468	5	0	30	510	3	505	34	0	10	542	4	0	8	0	37	12	26	0	62	0	30	88	1152
Approach %	7.3	91.8	1.0	0.0	-	-	0.6	93.2	6.3	0.0	-	-	33.3	0.0	66.7	0.0	-	-	29.5	0.0	70.5	0.0	-	-	-
Total %	3.2	40.6	0.4	0.0	-	44.3	0.3	43.8	3.0	0.0	-	47.0	0.3	0.0	0.7	0.0	-	1.0	2.3	0.0	5.4	0.0	-	7.6	-
PHF	0.712	0.959	0.625	0.000	-	0.951	0.750	0.908	0.773	0.000	-	0.897	0.500	0.000	0.500	0.000	-	0.600	0.591	0.000	0.775	0.000	-	0.815	0.938
Lights	31	458	4	0	-	493	2	491	33	0	-	526	3	0	8	0	-	11	22	0	53	0	-	75	1105
% Lights	83.8	97.9	80.0	-	-	96.7	66.7	97.2	97.1	-	-	97.0	75.0	-	100.0	-	-	91.7	84.6	-	85.5	-	-	85.2	95.9
Buses	5	0	0	0	-	5	0	5	0	0	-	5	0	0	0	0	-	0	4	0	7	0	-	11	21
% Buses	13.5	0.0	0.0	-	-	1.0	0.0	1.0	0.0	-	-	0.9	0.0	-	0.0	-	-	0.0	15.4	-	11.3	-	-	12.5	1.8
Single-Unit Trucks	1	9	1	0	-	11	1	9	1	0	-	11	1	0	0	0	-	1	0	0	2	0	-	2	25
% Single-Unit Trucks	2.7	1.9	20.0	-	-	2.2	33.3	1.8	2.9	-	-	2.0	25.0	-	0.0	-	-	8.3	0.0	-	3.2	-	-	2.3	2.2
Articulated Trucks	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.2	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	3.3	-	-
Pedestrians	-	-	-	-	30	-	-	-	-	-	10	-	-	-	-	-	37	-	-	-	-	-	29	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	96.7	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Elizabeth Street
Site Code: 200116
Start Date: 03/03/2020

Peak Hour Data

03/03/2020 12:15 PM
Ending At
03/03/2020 1:15 PM

Lights
Buses
Single-Unit Trucks
Articulated Trucks
Other

Elizabeth Street [N]

Out	In	Total
64	75	139
5	11	16
2	2	4
0	0	0
0	0	0
71	**88**	**159**

R	T	L	U	P
53	0	22	0	0
7	0	4	0	0
2	0	0	0	0
0	0	0	0	0
0	0	0	0	30
62	**0**	**26**	**0**	**30**

Lakeshore Road [W]

Out	In	Total
547	493	1040
12	5	17
12	11	23
0	1	1
0	0	0
571	**510**	**1081**

U	L	T	R	P
0	31	458	4	0
0	5	0	0	0
0	1	9	1	0
0	0	1	0	0
0	0	0	0	30
0	**37**	**468**	**5**	**30**

Lakeshore Road [E]

Out	In	Total
488	526	1014
4	5	9
9	11	20
1	0	1
0	0	0
502	**542**	**1044**

R	T	L	U	P
33	491	2	0	0
0	5	0	0	0
1	9	1	0	0
0	0	0	0	0
0	0	0	0	10
34	**505**	**3**	**0**	**10**

U	L	T	R	P
0	3	0	8	0
0	0	0	0	0
0	1	0	0	0
0	0	0	0	0
0	0	0	0	37
0	**4**	**0**	**8**	**37**

Out	In	Total
6	11	17
0	0	0
2	1	3
0	0	0
0	0	0
8	**12**	**20**

Elizabeth Street [S]

Turning Movement Peak Hour Data Plot (12:15 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Elizabeth Street
Site Code: 200116
Start Date: 03/03/2020

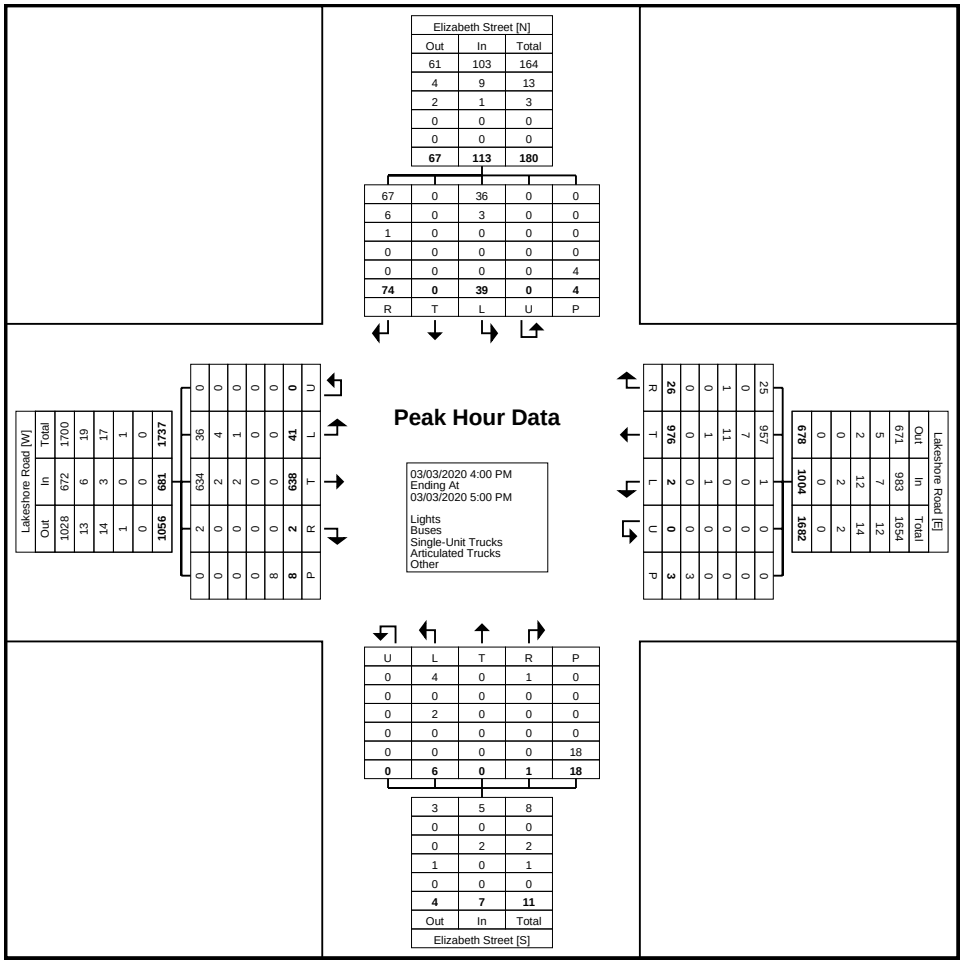
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Lakeshore Road Eastbound						Lakeshore Road Westbound						Elizabeth Street Northbound						Elizabeth Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	14	158	1	0	0	173	1	235	7	0	2	243	2	0	1	0	6	3	14	0	23	0	1	37	456
4:15 PM	10	170	0	0	3	180	0	258	6	0	1	264	3	0	0	0	4	3	10	0	17	0	2	27	474
4:30 PM	8	139	0	0	3	147	0	259	5	0	0	264	0	0	0	0	1	0	5	0	18	0	0	23	434
4:45 PM	9	171	1	0	2	181	1	224	8	0	0	233	1	0	0	0	7	1	10	0	16	0	1	26	441
Total	41	638	2	0	8	681	2	976	26	0	3	1004	6	0	1	0	18	7	39	0	74	0	4	113	1805
Approach %	6.0	93.7	0.3	0.0	-	-	0.2	97.2	2.6	0.0	-	-	85.7	0.0	14.3	0.0	-	-	34.5	0.0	65.5	0.0	-	-	-
Total %	2.3	35.3	0.1	0.0	-	37.7	0.1	54.1	1.4	0.0	-	55.6	0.3	0.0	0.1	0.0	-	0.4	2.2	0.0	4.1	0.0	-	6.3	-
PHF	0.732	0.933	0.500	0.000	-	0.941	0.500	0.942	0.813	0.000	-	0.951	0.500	0.000	0.250	0.000	-	0.583	0.696	0.000	0.804	0.000	-	0.764	0.952
Lights	36	634	2	0	-	672	1	957	25	0	-	983	4	0	1	0	-	5	36	0	67	0	-	103	1763
% Lights	87.8	99.4	100.0	-	-	98.7	50.0	98.1	96.2	-	-	97.9	66.7	-	100.0	-	-	71.4	92.3	-	90.5	-	-	91.2	97.7
Buses	4	2	0	0	-	6	0	7	0	0	-	7	0	0	0	0	-	0	3	0	6	0	-	9	22
% Buses	9.8	0.3	0.0	-	-	0.9	0.0	0.7	0.0	-	-	0.7	0.0	-	0.0	-	-	0.0	7.7	-	8.1	-	-	8.0	1.2
Single-Unit Trucks	1	2	0	0	-	3	0	11	1	0	-	12	2	0	0	0	-	2	0	0	1	0	-	1	18
% Single-Unit Trucks	2.4	0.3	0.0	-	-	0.4	0.0	1.1	3.8	-	-	1.2	33.3	-	0.0	-	-	28.6	0.0	-	1.4	-	-	0.9	1.0
Articulated Trucks	0	0	0	0	-	0	1	1	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	50.0	0.1	0.0	-	-	0.2	0.0	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	3	-	-	-	-	-	18	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Elizabeth Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (4:00 PM)

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5A-150 Pinebush Rd

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519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Elizabeth Street
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Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Martha Street
Site Code: 170176
Start Date: 02/13/2020

Turning Movement Data

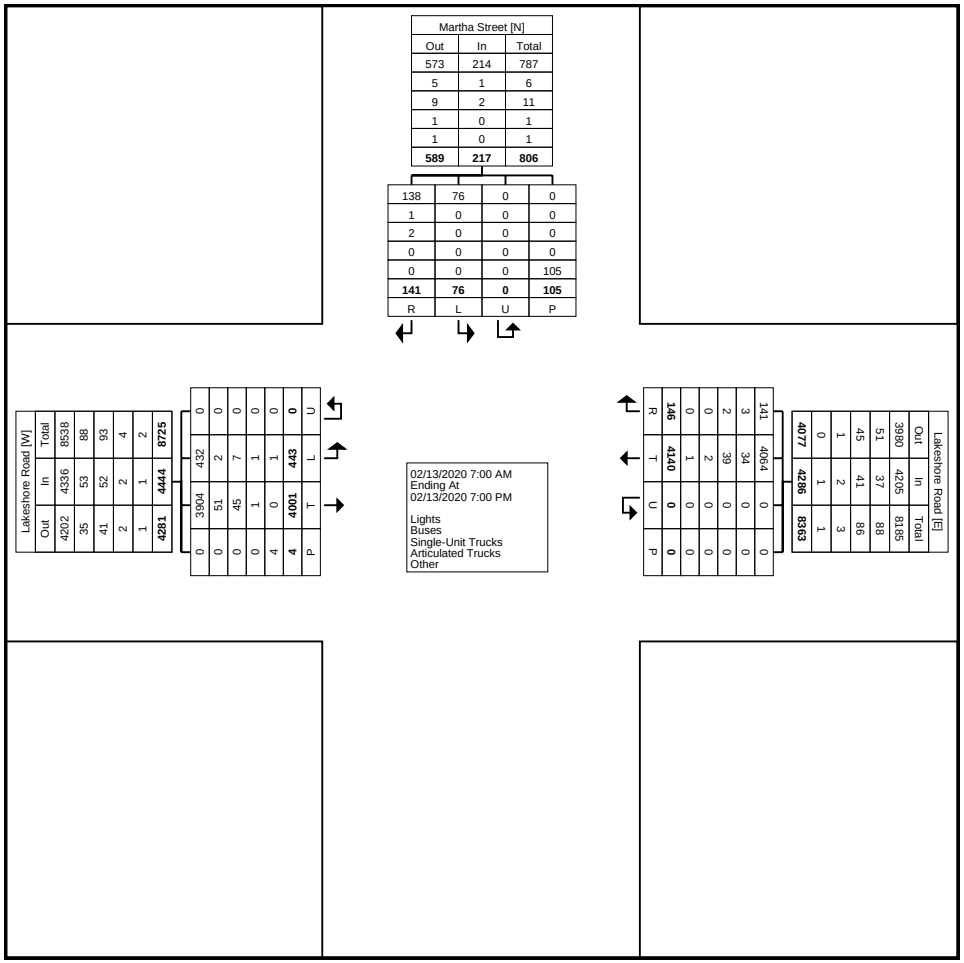
Start Time	Lakeshore Road Eastbound					Lakeshore Road Westbound					Martha Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	10	157	0	0	167	52	0	0	0	52	2	3	0	4	5	224
7:15 AM	12	165	0	0	177	75	1	0	0	76	2	3	0	1	5	258
7:30 AM	10	204	0	0	214	101	1	0	0	102	0	2	0	3	2	318
7:45 AM	30	195	0	0	225	103	3	0	0	106	2	1	0	1	3	334
Hourly Total	62	721	0	0	783	331	5	0	0	336	6	9	0	9	15	1134
8:00 AM	20	194	0	0	214	127	4	0	0	131	5	11	0	5	16	361
8:15 AM	23	203	0	0	226	114	4	0	0	118	2	3	0	2	5	349
8:30 AM	24	159	0	0	183	130	8	0	0	138	3	3	0	5	6	327
8:45 AM	15	155	0	0	170	117	4	0	0	121	4	3	0	6	7	298
Hourly Total	82	711	0	0	793	488	20	0	0	508	14	20	0	18	34	1335
9:00 AM	19	145	0	0	164	110	7	0	0	117	3	5	0	2	8	289
9:15 AM	13	115	0	0	128	109	2	0	0	111	4	6	0	1	10	249
9:30 AM	12	106	0	0	118	120	8	0	0	128	3	5	0	4	8	254
9:45 AM	13	97	0	0	110	90	2	0	0	92	3	4	0	7	7	209
Hourly Total	57	463	0	0	520	429	19	0	0	448	13	20	0	14	33	1001
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	7	69	0	0	76	102	3	0	0	105	6	5	0	7	11	192
11:45 AM	8	91	0	0	99	76	5	0	0	81	1	6	0	5	7	187
Hourly Total	15	160	0	0	175	178	8	0	0	186	7	11	0	12	18	379
12:00 PM	13	111	0	0	124	122	4	0	0	126	3	4	0	4	7	257
12:15 PM	12	102	0	0	114	109	4	0	0	113	1	7	0	2	8	235
12:30 PM	13	97	0	0	110	134	4	0	0	138	1	9	0	4	10	258
12:45 PM	11	110	0	1	121	118	6	0	0	124	5	5	0	5	10	255
Hourly Total	49	420	0	1	469	483	18	0	0	501	10	25	0	15	35	1005
1:00 PM	8	85	0	0	93	107	1	0	0	108	1	5	0	5	6	207
1:15 PM	8	96	0	1	104	123	5	0	0	128	2	3	0	1	5	237
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	16	181	0	1	197	230	6	0	0	236	3	8	0	6	11	444
4:00 PM	15	119	0	0	134	182	2	0	0	184	1	9	0	1	10	328
4:15 PM	5	135	0	0	140	208	5	0	0	213	4	3	0	0	7	360
4:30 PM	14	105	0	1	119	237	5	0	0	242	2	7	0	5	9	370
4:45 PM	18	151	0	0	169	228	9	0	0	237	1	2	0	3	3	409
Hourly Total	52	510	0	1	562	855	21	0	0	876	8	21	0	9	29	1467
5:00 PM	8	146	0	0	154	204	5	0	0	209	2	3	0	4	5	368
5:15 PM	21	118	0	0	139	192	9	0	0	201	0	5	0	3	5	345
5:30 PM	14	127	0	0	141	174	6	0	0	180	4	2	0	5	6	327

5:45 PM	11	102	0	0	113	161	7	0	0	168	1	3	0	2	4	285
Hourly Total	54	493	0	0	547	731	27	0	0	758	7	13	0	14	20	1325
6:00 PM	19	108	0	1	127	107	7	0	0	114	1	1	0	3	2	243
6:15 PM	9	79	0	0	88	108	6	0	0	114	2	4	0	2	6	208
6:30 PM	15	81	0	0	96	100	3	0	0	103	1	5	0	1	6	205
6:45 PM	13	74	0	0	87	100	6	0	0	106	4	4	0	2	8	201
Hourly Total	56	342	0	1	398	415	22	0	0	437	8	14	0	8	22	857
Grand Total	443	4001	0	4	4444	4140	146	0	0	4286	76	141	0	105	217	8947
Approach %	10.0	90.0	0.0	-	-	96.6	3.4	0.0	-	-	35.0	65.0	0.0	-	-	-
Total %	5.0	44.7	0.0	-	49.7	46.3	1.6	0.0	-	47.9	0.8	1.6	0.0	-	2.4	-
Lights	432	3904	0	-	4336	4064	141	0	-	4205	76	138	0	-	214	8755
% Lights	97.5	97.6	-	-	97.6	98.2	96.6	-	-	98.1	100.0	97.9	-	-	98.6	97.9
Buses	2	51	0	-	53	34	3	0	-	37	0	1	0	-	1	91
% Buses	0.5	1.3	-	-	1.2	0.8	2.1	-	-	0.9	0.0	0.7	-	-	0.5	1.0
Single-Unit Trucks	7	45	0	-	52	39	2	0	-	41	0	2	0	-	2	95
% Single-Unit Trucks	1.6	1.1	-	-	1.2	0.9	1.4	-	-	1.0	0.0	1.4	-	-	0.9	1.1
Articulated Trucks	1	1	0	-	2	2	0	0	-	2	0	0	0	-	0	4
% Articulated Trucks	0.2	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	1	0	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Bicycles on Road	0.2	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	4	-	-	-	-	0	-	-	-	-	105	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Martha Street
Site Code: 170176
Start Date: 02/13/2020



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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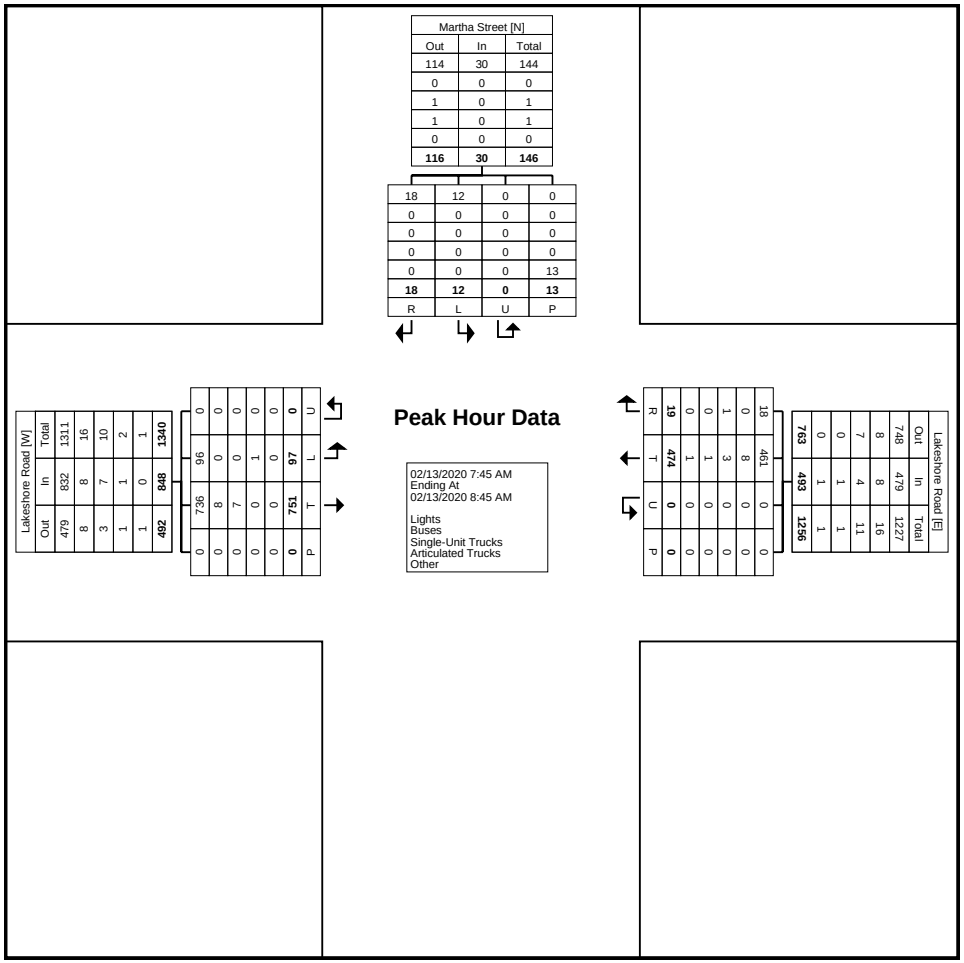
Turning Movement Peak Hour Data (7:45 AM)

Start Time	Lakeshore Road Eastbound					Lakeshore Road Westbound					Martha Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	30	195	0	0	225	103	3	0	0	106	2	1	0	1	3	334
8:00 AM	20	194	0	0	214	127	4	0	0	131	5	11	0	5	16	361
8:15 AM	23	203	0	0	226	114	4	0	0	118	2	3	0	2	5	349
8:30 AM	24	159	0	0	183	130	8	0	0	138	3	3	0	5	6	327
Total	97	751	0	0	848	474	19	0	0	493	12	18	0	13	30	1371
Approach %	11.4	88.6	0.0	-	-	96.1	3.9	0.0	-	-	40.0	60.0	0.0	-	-	-
Total %	7.1	54.8	0.0	-	61.9	34.6	1.4	0.0	-	36.0	0.9	1.3	0.0	-	2.2	-
PHF	0.808	0.925	0.000	-	0.938	0.912	0.594	0.000	-	0.893	0.600	0.409	0.000	-	0.469	0.949
Lights	96	736	0	-	832	461	18	0	-	479	12	18	0	-	30	1341
% Lights	99.0	98.0	-	-	98.1	97.3	94.7	-	-	97.2	100.0	100.0	-	-	100.0	97.8
Buses	0	8	0	-	8	8	0	0	-	8	0	0	0	-	0	16
% Buses	0.0	1.1	-	-	0.9	1.7	0.0	-	-	1.6	0.0	0.0	-	-	0.0	1.2
Single-Unit Trucks	0	7	0	-	7	3	1	0	-	4	0	0	0	-	0	11
% Single-Unit Trucks	0.0	0.9	-	-	0.8	0.6	5.3	-	-	0.8	0.0	0.0	-	-	0.0	0.8
Articulated Trucks	1	0	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Articulated Trucks	1.0	0.0	-	-	0.1	0.2	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.2	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	13	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Martha Street
Site Code: 170176
Start Date: 02/13/2020



Turning Movement Peak Hour Data Plot (7:45 AM)

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Count Name: Lakeshore Road & Martha Street
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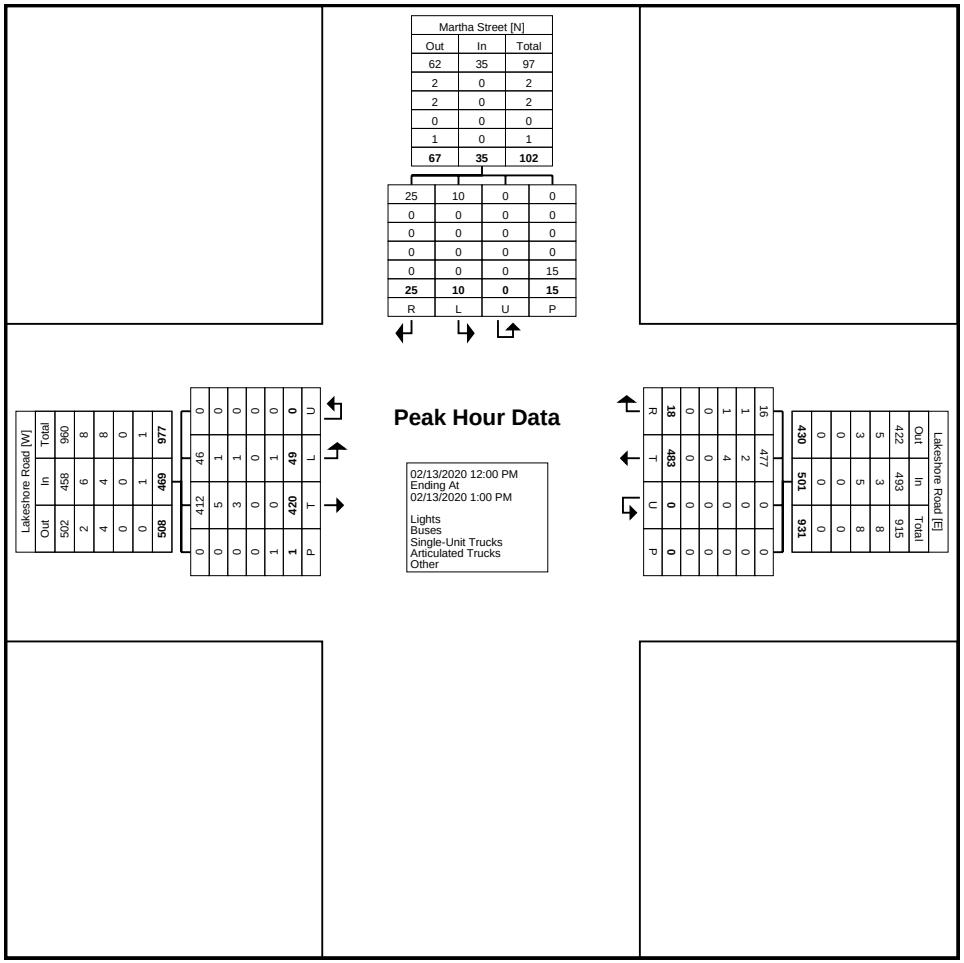
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Lakeshore Road Eastbound					Lakeshore Road Westbound					Martha Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	13	111	0	0	124	122	4	0	0	126	3	4	0	4	7	257
12:15 PM	12	102	0	0	114	109	4	0	0	113	1	7	0	2	8	235
12:30 PM	13	97	0	0	110	134	4	0	0	138	1	9	0	4	10	258
12:45 PM	11	110	0	1	121	118	6	0	0	124	5	5	0	5	10	255
Total	49	420	0	1	469	483	18	0	0	501	10	25	0	15	35	1005
Approach %	10.4	89.6	0.0	-	-	96.4	3.6	0.0	-	-	28.6	71.4	0.0	-	-	-
Total %	4.9	41.8	0.0	-	46.7	48.1	1.8	0.0	-	49.9	1.0	2.5	0.0	-	3.5	-
PHF	0.942	0.946	0.000	-	0.946	0.901	0.750	0.000	-	0.908	0.500	0.694	0.000	-	0.875	0.974
Lights	46	412	0	-	458	477	16	0	-	493	10	25	0	-	35	986
% Lights	93.9	98.1	-	-	97.7	98.8	88.9	-	-	98.4	100.0	100.0	-	-	100.0	98.1
Buses	1	5	0	-	6	2	1	0	-	3	0	0	0	-	0	9
% Buses	2.0	1.2	-	-	1.3	0.4	5.6	-	-	0.6	0.0	0.0	-	-	0.0	0.9
Single-Unit Trucks	1	3	0	-	4	4	1	0	-	5	0	0	0	-	0	9
% Single-Unit Trucks	2.0	0.7	-	-	0.9	0.8	5.6	-	-	1.0	0.0	0.0	-	-	0.0	0.9
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	2.0	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	15	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

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Site Code: 170176
Start Date: 02/13/2020

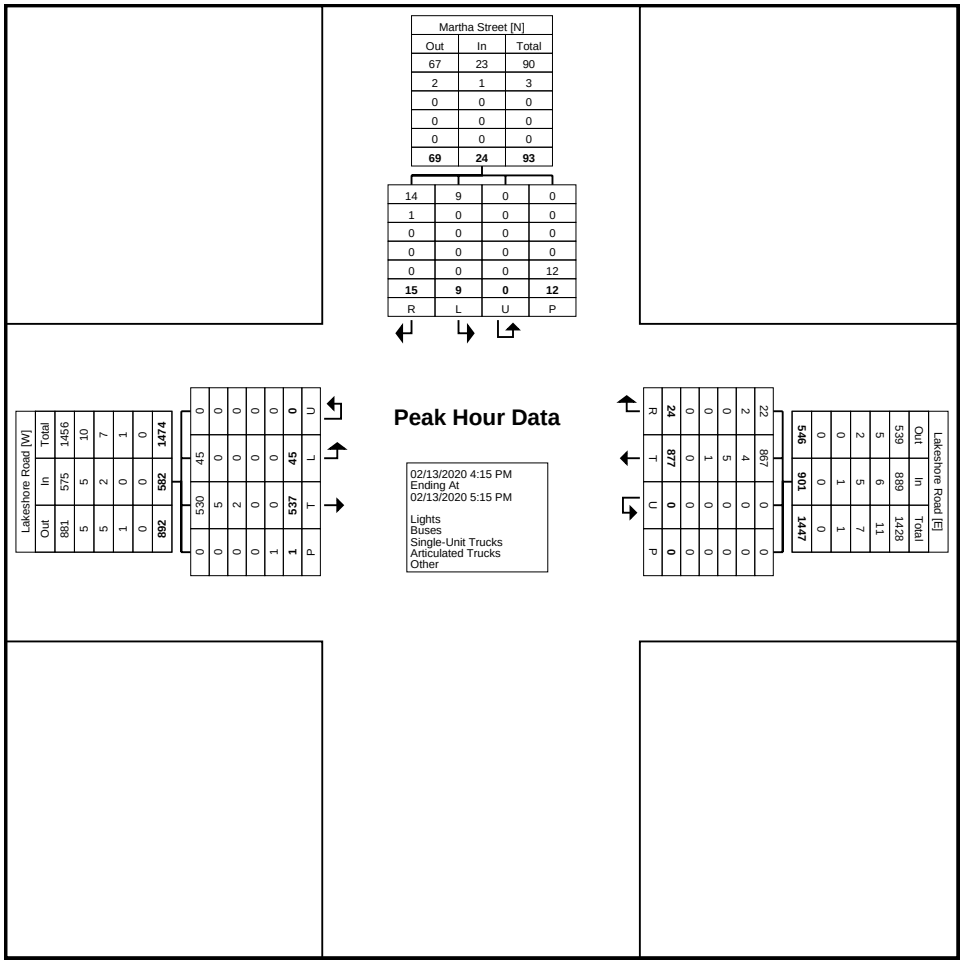
Turning Movement Peak Hour Data (4:15 PM)

Start Time	Lakeshore Road Eastbound					Lakeshore Road Westbound					Martha Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	5	135	0	0	140	208	5	0	0	213	4	3	0	0	7	360
4:30 PM	14	105	0	1	119	237	5	0	0	242	2	7	0	5	9	370
4:45 PM	18	151	0	0	169	228	9	0	0	237	1	2	0	3	3	409
5:00 PM	8	146	0	0	154	204	5	0	0	209	2	3	0	4	5	368
Total	45	537	0	1	582	877	24	0	0	901	9	15	0	12	24	1507
Approach %	7.7	92.3	0.0	-	-	97.3	2.7	0.0	-	-	37.5	62.5	0.0	-	-	-
Total %	3.0	35.6	0.0	-	38.6	58.2	1.6	0.0	-	59.8	0.6	1.0	0.0	-	1.6	-
PHF	0.625	0.889	0.000	-	0.861	0.925	0.667	0.000	-	0.931	0.563	0.536	0.000	-	0.667	0.921
Lights	45	530	0	-	575	867	22	0	-	889	9	14	0	-	23	1487
% Lights	100.0	98.7	-	-	98.8	98.9	91.7	-	-	98.7	100.0	93.3	-	-	95.8	98.7
Buses	0	5	0	-	5	4	2	0	-	6	0	1	0	-	1	12
% Buses	0.0	0.9	-	-	0.9	0.5	8.3	-	-	0.7	0.0	6.7	-	-	4.2	0.8
Single-Unit Trucks	0	2	0	-	2	5	0	0	-	5	0	0	0	-	0	7
% Single-Unit Trucks	0.0	0.4	-	-	0.3	0.6	0.0	-	-	0.6	0.0	0.0	-	-	0.0	0.5
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.1	0.0	-	-	0.1	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	12	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lakeshore Road & Martha Street
Site Code: 170176
Start Date: 02/13/2020



Turning Movement Peak Hour Data Plot (4:15 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Lakeshore Road & Martha Street
Site Code: 170176
Start Date: 02/13/2020

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Martha Street & Pine Street
Site Code: 200116
Start Date: 03/03/2020

Turning Movement Data

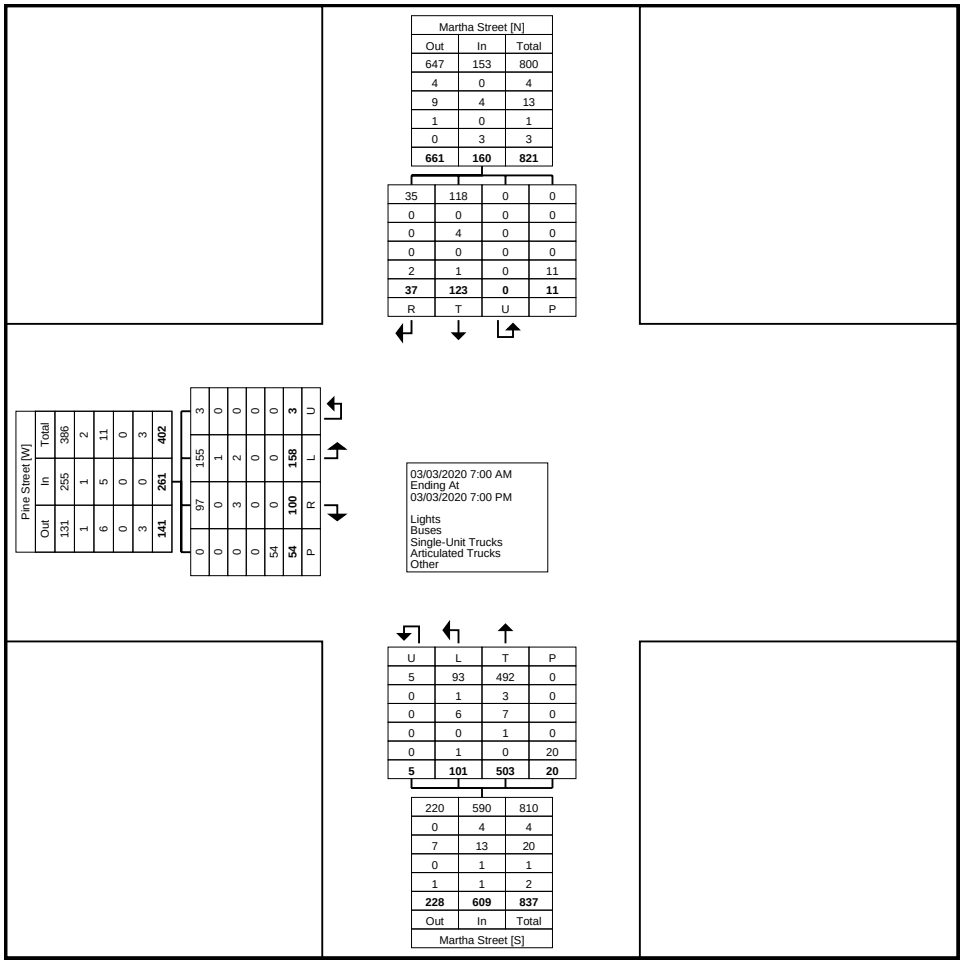
Start Time	Pine Street Eastbound					Martha Street Northbound					Martha Street Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	1	0	0	4	1	1	11	0	1	12	2	0	0	0	2	15
7:15 AM	1	0	0	1	1	1	11	0	1	12	4	0	0	0	4	17
7:30 AM	3	1	0	2	4	0	13	1	0	14	2	0	0	0	2	20
7:45 AM	0	2	0	3	2	1	23	0	0	24	7	2	0	0	9	35
Hourly Total	5	3	0	10	8	3	58	1	2	62	15	2	0	0	17	87
8:00 AM	7	1	0	2	8	1	27	0	0	28	7	1	0	0	8	44
8:15 AM	4	4	0	1	8	3	22	0	3	25	7	2	0	1	9	42
8:30 AM	7	0	0	2	7	4	29	1	1	34	3	1	0	1	4	45
8:45 AM	4	3	0	2	7	5	23	0	0	28	6	2	0	0	8	43
Hourly Total	22	8	0	7	30	13	101	1	4	115	23	6	0	2	29	174
9:00 AM	2	1	0	3	3	2	20	0	0	22	5	1	0	2	6	31
9:15 AM	5	2	0	3	7	1	12	0	0	13	2	1	0	0	3	23
9:30 AM	2	3	0	5	5	4	18	0	2	22	5	1	0	0	6	33
9:45 AM	5	1	0	3	6	4	12	0	1	16	3	1	0	0	4	26
Hourly Total	14	7	0	14	21	11	62	0	3	73	15	4	0	2	19	113
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	2	3	0	2	5	4	4	0	0	8	3	0	0	1	3	16
11:45 AM	5	6	1	1	12	3	14	0	0	17	4	2	0	1	6	35
Hourly Total	7	9	1	3	17	7	18	0	0	25	7	2	0	2	9	51
12:00 PM	8	4	0	0	12	7	14	0	0	21	2	0	0	0	2	35
12:15 PM	1	7	0	0	8	4	25	0	0	29	4	2	0	0	6	43
12:30 PM	3	7	0	0	10	6	19	0	0	25	2	3	0	0	5	40
12:45 PM	10	2	0	3	12	6	10	0	1	16	7	3	0	2	10	38
Hourly Total	22	20	0	3	42	23	68	0	1	91	15	8	0	2	23	156
1:00 PM	13	5	0	0	18	4	12	0	2	16	5	1	0	0	6	40
1:15 PM	8	5	0	2	13	3	10	0	1	13	6	3	0	0	9	35
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	21	10	0	2	31	7	22	0	3	29	11	4	0	0	15	75
4:00 PM	2	3	0	0	5	3	7	0	1	10	2	0	0	0	2	17
4:15 PM	8	4	0	2	12	4	16	2	1	22	3	0	0	0	3	37
4:30 PM	8	4	1	1	13	4	6	0	1	10	3	0	0	0	3	26
4:45 PM	6	7	0	2	13	4	17	0	0	21	5	1	0	2	6	40
Hourly Total	24	18	1	5	43	15	46	2	3	63	13	1	0	2	14	120
5:00 PM	6	3	0	1	9	5	21	0	1	26	4	0	0	0	4	39
5:15 PM	7	4	0	1	11	7	23	0	0	30	2	1	0	0	3	44
5:30 PM	9	6	0	2	15	2	20	0	0	22	3	2	0	0	5	42

5:45 PM	7	3	0	1	10	4	24	0	0	28	4	1	0	0	5	43
Hourly Total	29	16	0	5	45	18	88	0	1	106	13	4	0	0	17	168
6:00 PM	4	2	0	1	6	1	11	0	0	12	2	3	0	0	5	23
6:15 PM	6	4	0	4	10	1	12	0	0	13	6	0	0	1	6	29
6:30 PM	2	1	0	0	3	0	9	1	3	10	1	3	0	0	4	17
6:45 PM	2	2	1	0	5	2	8	0	0	10	2	0	0	0	2	17
Hourly Total	14	9	1	5	24	4	40	1	3	45	11	6	0	1	17	86
Grand Total	158	100	3	54	261	101	503	5	20	609	123	37	0	11	160	1030
Approach %	60.5	38.3	1.1	-	-	16.6	82.6	0.8	-	-	76.9	23.1	0.0	-	-	-
Total %	15.3	9.7	0.3	-	25.3	9.8	48.8	0.5	-	59.1	11.9	3.6	0.0	-	15.5	-
Lights	155	97	3	-	255	93	492	5	-	590	118	35	0	-	153	998
% Lights	98.1	97.0	100.0	-	97.7	92.1	97.8	100.0	-	96.9	95.9	94.6	-	-	95.6	96.9
Buses	1	0	0	-	1	1	3	0	-	4	0	0	0	-	0	5
% Buses	0.6	0.0	0.0	-	0.4	1.0	0.6	0.0	-	0.7	0.0	0.0	-	-	0.0	0.5
Single-Unit Trucks	2	3	0	-	5	6	7	0	-	13	4	0	0	-	4	22
% Single-Unit Trucks	1.3	3.0	0.0	-	1.9	5.9	1.4	0.0	-	2.1	3.3	0.0	-	-	2.5	2.1
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	1	0	0	-	1	1	2	0	-	3	4
% Bicycles on Road	0.0	0.0	0.0	-	0.0	1.0	0.0	0.0	-	0.2	0.8	5.4	-	-	1.9	0.4
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	54	-	-	-	-	20	-	-	-	-	11	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Martha Street & Pine Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Data Plot

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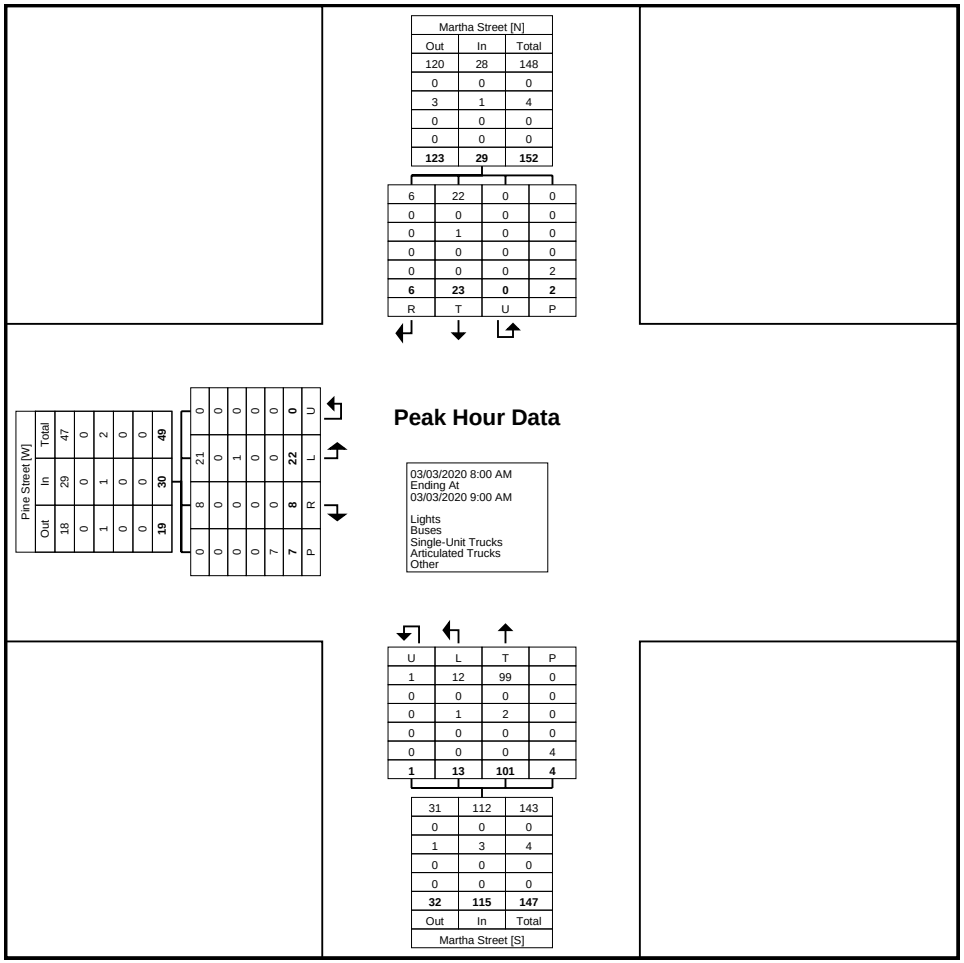
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Pine Street Eastbound					Martha Street Northbound					Martha Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
8:00 AM	7	1	0	2	8	1	27	0	0	28	7	1	0	0	8	44
8:15 AM	4	4	0	1	8	3	22	0	3	25	7	2	0	1	9	42
8:30 AM	7	0	0	2	7	4	29	1	1	34	3	1	0	1	4	45
8:45 AM	4	3	0	2	7	5	23	0	0	28	6	2	0	0	8	43
Total	22	8	0	7	30	13	101	1	4	115	23	6	0	2	29	174
Approach %	73.3	26.7	0.0	-	-	11.3	87.8	0.9	-	-	79.3	20.7	0.0	-	-	-
Total %	12.6	4.6	0.0	-	17.2	7.5	58.0	0.6	-	66.1	13.2	3.4	0.0	-	16.7	-
PHF	0.786	0.500	0.000	-	0.938	0.650	0.871	0.250	-	0.846	0.821	0.750	0.000	-	0.806	0.967
Lights	21	8	0	-	29	12	99	1	-	112	22	6	0	-	28	169
% Lights	95.5	100.0	-	-	96.7	92.3	98.0	100.0	-	97.4	95.7	100.0	-	-	96.6	97.1
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	1	0	0	-	1	1	2	0	-	3	1	0	0	-	1	5
% Single-Unit Trucks	4.5	0.0	-	-	3.3	7.7	2.0	0.0	-	2.6	4.3	0.0	-	-	3.4	2.9
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	7	-	-	-	-	4	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Martha Street & Pine Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (8:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Martha Street & Pine Street
Site Code: 200116
Start Date: 03/03/2020

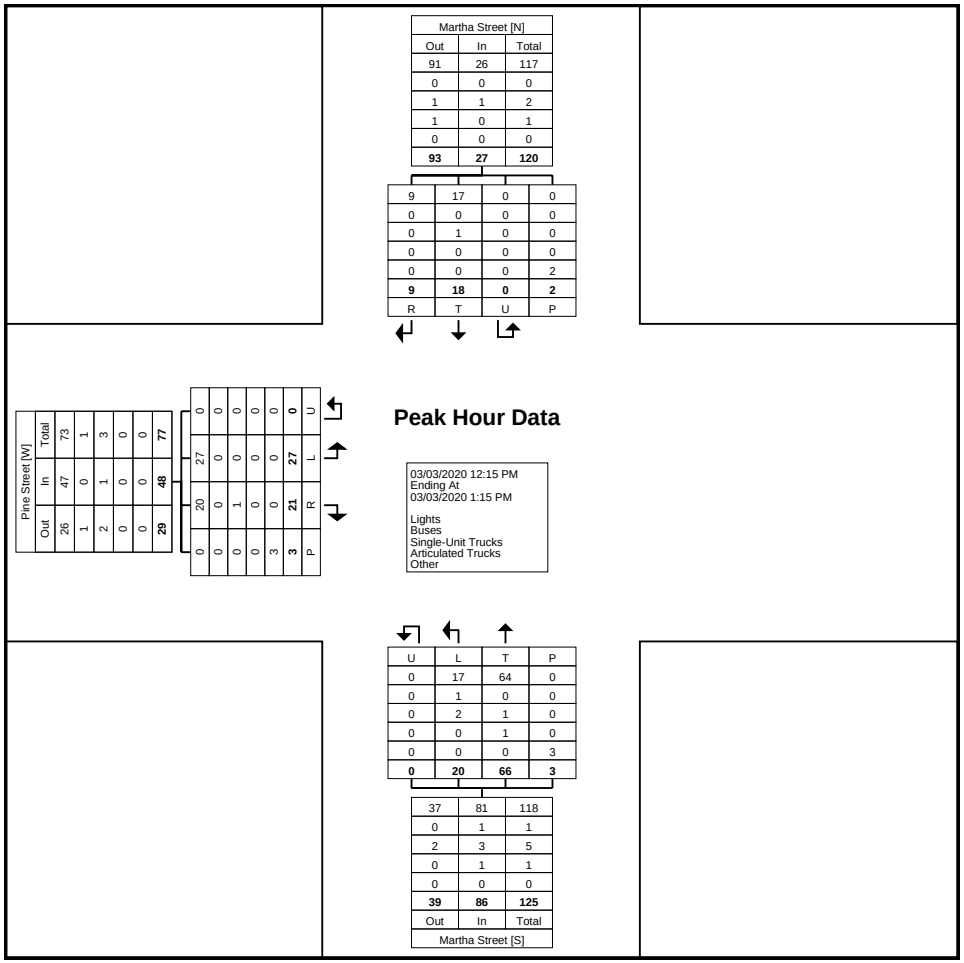
Turning Movement Peak Hour Data (12:15 PM)

Start Time	Pine Street Eastbound					Martha Street Northbound					Martha Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:15 PM	1	7	0	0	8	4	25	0	0	29	4	2	0	0	6	43
12:30 PM	3	7	0	0	10	6	19	0	0	25	2	3	0	0	5	40
12:45 PM	10	2	0	3	12	6	10	0	1	16	7	3	0	2	10	38
1:00 PM	13	5	0	0	18	4	12	0	2	16	5	1	0	0	6	40
Total	27	21	0	3	48	20	66	0	3	86	18	9	0	2	27	161
Approach %	56.3	43.8	0.0	-	-	23.3	76.7	0.0	-	-	66.7	33.3	0.0	-	-	-
Total %	16.8	13.0	0.0	-	29.8	12.4	41.0	0.0	-	53.4	11.2	5.6	0.0	-	16.8	-
PHF	0.519	0.750	0.000	-	0.667	0.833	0.660	0.000	-	0.741	0.643	0.750	0.000	-	0.675	0.936
Lights	27	20	0	-	47	17	64	0	-	81	17	9	0	-	26	154
% Lights	100.0	95.2	-	-	97.9	85.0	97.0	-	-	94.2	94.4	100.0	-	-	96.3	95.7
Buses	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Buses	0.0	0.0	-	-	0.0	5.0	0.0	-	-	1.2	0.0	0.0	-	-	0.0	0.6
Single-Unit Trucks	0	1	0	-	1	2	1	0	-	3	1	0	0	-	1	5
% Single-Unit Trucks	0.0	4.8	-	-	2.1	10.0	1.5	-	-	3.5	5.6	0.0	-	-	3.7	3.1
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	1.5	-	-	1.2	0.0	0.0	-	-	0.0	0.6
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	3	-	-	-	-	3	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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Count Name: Martha Street & Pine Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (12:15 PM)

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Count Name: Martha Street & Pine Street
Site Code: 200116
Start Date: 03/03/2020

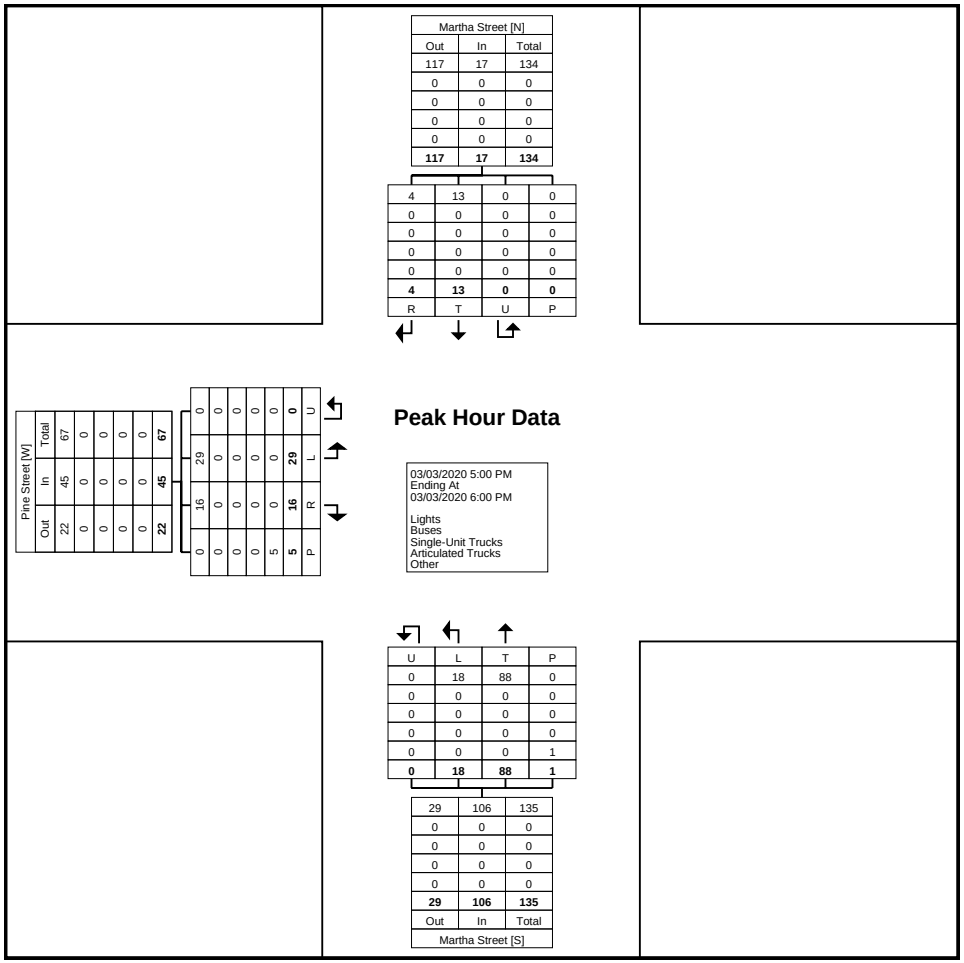
Turning Movement Peak Hour Data (5:00 PM)

Start Time	Pine Street Eastbound					Martha Street Northbound					Martha Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
5:00 PM	6	3	0	1	9	5	21	0	1	26	4	0	0	0	4	39
5:15 PM	7	4	0	1	11	7	23	0	0	30	2	1	0	0	3	44
5:30 PM	9	6	0	2	15	2	20	0	0	22	3	2	0	0	5	42
5:45 PM	7	3	0	1	10	4	24	0	0	28	4	1	0	0	5	43
Total	29	16	0	5	45	18	88	0	1	106	13	4	0	0	17	168
Approach %	64.4	35.6	0.0	-	-	17.0	83.0	0.0	-	-	76.5	23.5	0.0	-	-	-
Total %	17.3	9.5	0.0	-	26.8	10.7	52.4	0.0	-	63.1	7.7	2.4	0.0	-	10.1	-
PHF	0.806	0.667	0.000	-	0.750	0.643	0.917	0.000	-	0.883	0.813	0.500	0.000	-	0.850	0.955
Lights	29	16	0	-	45	18	88	0	-	106	13	4	0	-	17	168
% Lights	100.0	100.0	-	-	100.0	100.0	100.0	-	-	100.0	100.0	100.0	-	-	100.0	100.0
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	5	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Martha Street & Pine Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (5:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Martha Street & Pine Street
Site Code: 200116
Start Date: 03/03/2020

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: New Street & Martha Street
Site Code: 200116
Start Date: 03/03/2020

Turning Movement Data

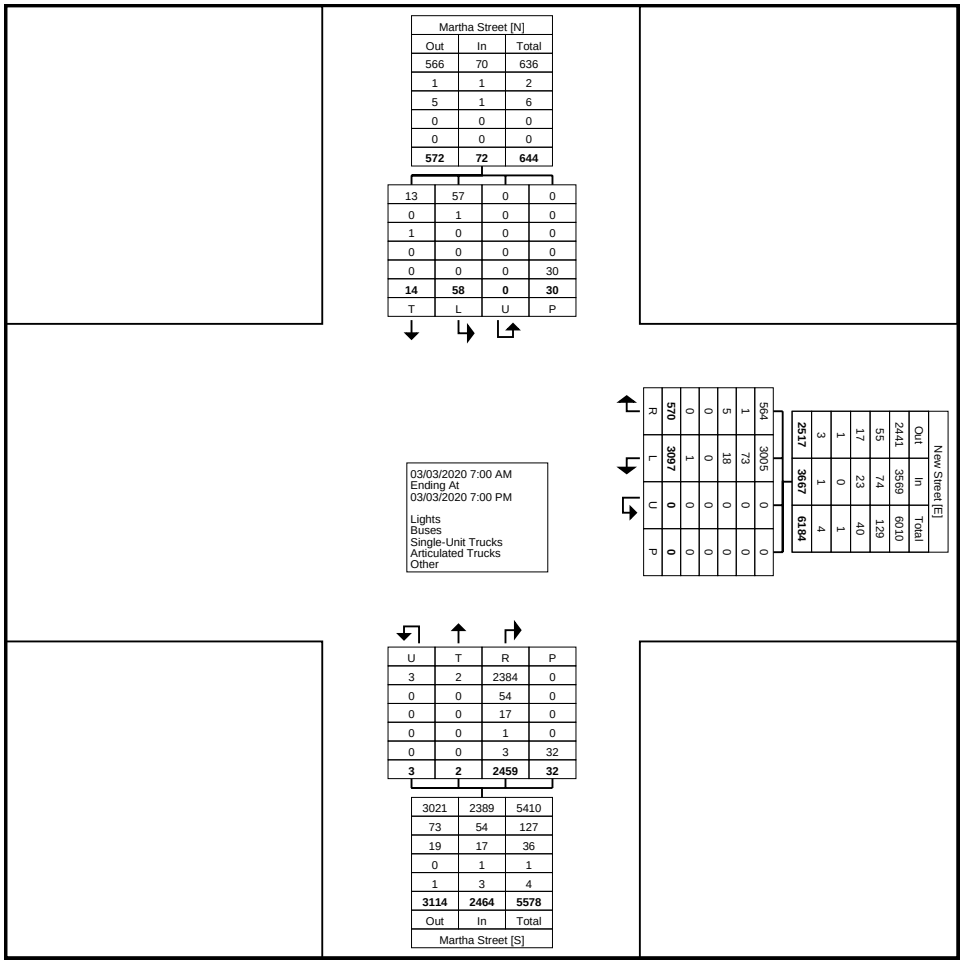
Start Time	New Street Westbound					Martha Street Northbound					Martha Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:00 AM	24	6	0	0	30	0	89	0	2	89	2	0	0	0	2	121
7:15 AM	31	4	0	0	35	0	87	0	2	87	1	1	0	2	2	124
7:30 AM	38	5	0	0	43	0	102	0	1	102	2	0	0	0	2	147
7:45 AM	42	20	0	0	62	0	125	0	1	125	2	1	0	1	3	190
Hourly Total	135	35	0	0	170	0	403	0	6	403	7	2	0	3	9	582
8:00 AM	74	17	0	0	91	0	124	0	3	124	4	0	0	0	4	219
8:15 AM	83	18	0	0	101	0	100	0	1	100	1	0	0	0	1	202
8:30 AM	69	11	0	0	80	0	103	0	1	103	2	0	0	1	2	185
8:45 AM	77	25	0	0	102	0	84	0	2	84	3	0	0	2	3	189
Hourly Total	303	71	0	0	374	0	411	0	7	411	10	0	0	3	10	795
9:00 AM	55	18	0	0	73	0	58	0	1	58	2	1	0	1	3	134
9:15 AM	81	18	0	0	99	0	69	0	3	69	1	0	0	2	1	169
9:30 AM	59	13	0	0	72	0	69	0	0	69	2	0	0	0	2	143
9:45 AM	73	12	0	0	85	0	60	0	1	60	2	0	0	1	2	147
Hourly Total	268	61	0	0	329	0	256	0	5	256	7	1	0	4	8	593
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	77	21	0	0	98	0	59	0	0	59	0	0	0	1	0	157
11:45 AM	75	13	0	0	88	1	64	0	0	65	1	0	0	0	1	154
Hourly Total	152	34	0	0	186	1	123	0	0	124	1	0	0	1	1	311
12:00 PM	87	10	0	0	97	0	65	1	0	66	0	2	0	0	2	165
12:15 PM	86	23	0	0	109	0	78	0	2	78	3	0	0	4	3	190
12:30 PM	87	17	0	0	104	0	58	0	0	58	1	2	0	2	3	165
12:45 PM	84	17	0	0	101	0	69	0	0	69	3	1	0	1	4	174
Hourly Total	344	67	0	0	411	0	270	1	2	271	7	5	0	7	12	694
1:00 PM	89	22	0	0	111	0	84	0	0	84	2	1	0	0	3	198
1:15 PM	74	23	0	0	97	0	57	0	1	57	1	0	0	0	1	155
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	163	45	0	0	208	0	141	0	1	141	3	1	0	0	4	353
4:00 PM	155	23	0	0	178	0	64	0	2	64	1	0	0	1	1	243
4:15 PM	156	21	0	0	177	1	76	0	4	77	3	0	0	3	3	257
4:30 PM	168	20	0	0	188	0	74	1	0	75	1	0	0	0	1	264
4:45 PM	186	14	0	0	200	0	80	0	1	80	0	1	0	1	1	281
Hourly Total	665	78	0	0	743	1	294	1	7	296	5	1	0	5	6	1045
5:00 PM	172	22	0	0	194	0	89	0	0	89	1	0	0	1	1	284
5:15 PM	208	29	0	0	237	0	89	0	2	89	5	0	0	0	5	331
5:30 PM	183	27	0	0	210	0	96	0	0	96	1	0	0	0	1	307

5:45 PM	145	28	0	0	173	0	69	0	1	69	2	1	0	3	3	245
Hourly Total	708	106	0	0	814	0	343	0	3	343	9	1	0	4	10	1167
6:00 PM	97	12	0	0	109	0	62	1	0	63	2	0	0	0	2	174
6:15 PM	93	24	0	0	117	0	58	0	0	58	3	1	0	0	4	179
6:30 PM	86	22	0	0	108	0	47	0	1	47	2	1	0	3	3	158
6:45 PM	83	15	0	0	98	0	51	0	0	51	2	1	0	0	3	152
Hourly Total	359	73	0	0	432	0	218	1	1	219	9	3	0	3	12	663
Grand Total	3097	570	0	0	3667	2	2459	3	32	2464	58	14	0	30	72	6203
Approach %	84.5	15.5	0.0	-	-	0.1	99.8	0.1	-	-	80.6	19.4	0.0	-	-	-
Total %	49.9	9.2	0.0	-	59.1	0.0	39.6	0.0	-	39.7	0.9	0.2	0.0	-	1.2	-
Lights	3005	564	0	-	3569	2	2384	3	-	2389	57	13	0	-	70	6028
% Lights	97.0	98.9	-	-	97.3	100.0	96.9	100.0	-	97.0	98.3	92.9	-	-	97.2	97.2
Buses	73	1	0	-	74	0	54	0	-	54	1	0	0	-	1	129
% Buses	2.4	0.2	-	-	2.0	0.0	2.2	0.0	-	2.2	1.7	0.0	-	-	1.4	2.1
Single-Unit Trucks	18	5	0	-	23	0	17	0	-	17	0	1	0	-	1	41
% Single-Unit Trucks	0.6	0.9	-	-	0.6	0.0	0.7	0.0	-	0.7	0.0	7.1	-	-	1.4	0.7
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	1	0	0	-	1	0	3	0	-	3	0	0	0	-	0	4
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	0.1	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	6.3	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	30	-	-	-	-	30	-	-
% Pedestrians	-	-	-	-	-	-	-	-	93.8	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: New Street & Martha Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: New Street & Martha Street
Site Code: 200116
Start Date: 03/03/2020

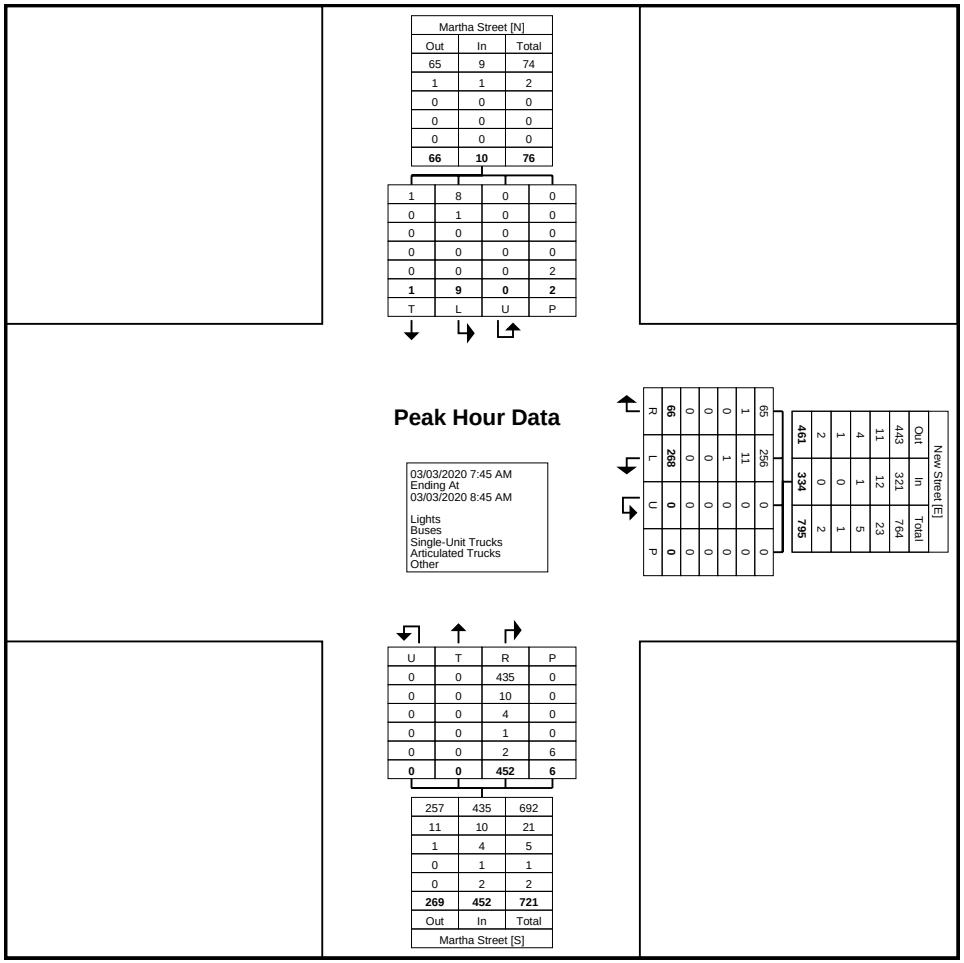
Turning Movement Peak Hour Data (7:45 AM)

Start Time	New Street Westbound					Martha Street Northbound					Martha Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:45 AM	42	20	0	0	62	0	125	0	1	125	2	1	0	1	3	190
8:00 AM	74	17	0	0	91	0	124	0	3	124	4	0	0	0	4	219
8:15 AM	83	18	0	0	101	0	100	0	1	100	1	0	0	0	1	202
8:30 AM	69	11	0	0	80	0	103	0	1	103	2	0	0	1	2	185
Total	268	66	0	0	334	0	452	0	6	452	9	1	0	2	10	796
Approach %	80.2	19.8	0.0	-	-	0.0	100.0	0.0	-	-	90.0	10.0	0.0	-	-	-
Total %	33.7	8.3	0.0	-	42.0	0.0	56.8	0.0	-	56.8	1.1	0.1	0.0	-	1.3	-
PHF	0.807	0.825	0.000	-	0.827	0.000	0.904	0.000	-	0.904	0.563	0.250	0.000	-	0.625	0.909
Lights	256	65	0	-	321	0	435	0	-	435	8	1	0	-	9	765
% Lights	95.5	98.5	-	-	96.1	-	96.2	-	-	96.2	88.9	100.0	-	-	90.0	96.1
Buses	11	1	0	-	12	0	10	0	-	10	1	0	0	-	1	23
% Buses	4.1	1.5	-	-	3.6	-	2.2	-	-	2.2	11.1	0.0	-	-	10.0	2.9
Single-Unit Trucks	1	0	0	-	1	0	4	0	-	4	0	0	0	-	0	5
% Single-Unit Trucks	0.4	0.0	-	-	0.3	-	0.9	-	-	0.9	0.0	0.0	-	-	0.0	0.6
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	-	0.2	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	-	-	0.0	-	0.4	-	-	0.4	0.0	0.0	-	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	6	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: New Street & Martha Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: New Street & Martha Street
Site Code: 200116
Start Date: 03/03/2020

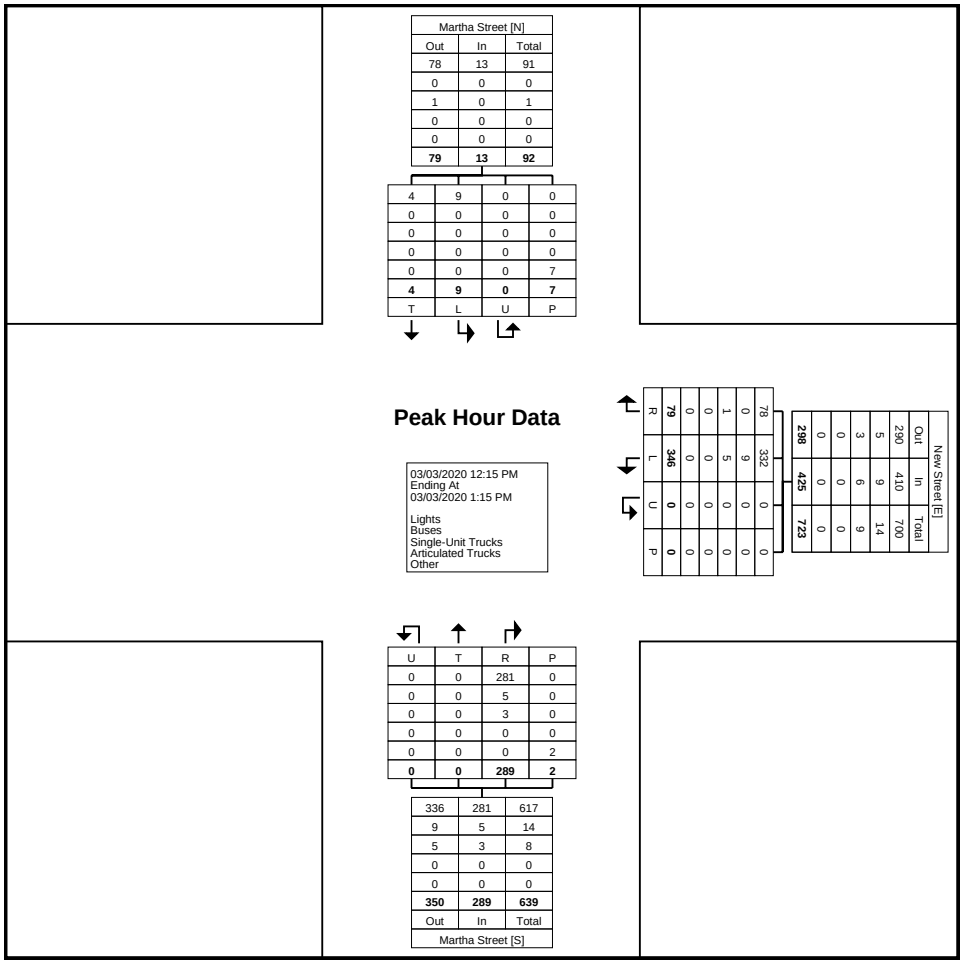
Turning Movement Peak Hour Data (12:15 PM)

Start Time	New Street Westbound					Martha Street Northbound					Martha Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
12:15 PM	86	23	0	0	109	0	78	0	2	78	3	0	0	4	3	190
12:30 PM	87	17	0	0	104	0	58	0	0	58	1	2	0	2	3	165
12:45 PM	84	17	0	0	101	0	69	0	0	69	3	1	0	1	4	174
1:00 PM	89	22	0	0	111	0	84	0	0	84	2	1	0	0	3	198
Total	346	79	0	0	425	0	289	0	2	289	9	4	0	7	13	727
Approach %	81.4	18.6	0.0	-	-	0.0	100.0	0.0	-	-	69.2	30.8	0.0	-	-	-
Total %	47.6	10.9	0.0	-	58.5	0.0	39.8	0.0	-	39.8	1.2	0.6	0.0	-	1.8	-
PHF	0.972	0.859	0.000	-	0.957	0.000	0.860	0.000	-	0.860	0.750	0.500	0.000	-	0.813	0.918
Lights	332	78	0	-	410	0	281	0	-	281	9	4	0	-	13	704
% Lights	96.0	98.7	-	-	96.5	-	97.2	-	-	97.2	100.0	100.0	-	-	100.0	96.8
Buses	9	0	0	-	9	0	5	0	-	5	0	0	0	-	0	14
% Buses	2.6	0.0	-	-	2.1	-	1.7	-	-	1.7	0.0	0.0	-	-	0.0	1.9
Single-Unit Trucks	5	1	0	-	6	0	3	0	-	3	0	0	0	-	0	9
% Single-Unit Trucks	1.4	1.3	-	-	1.4	-	1.0	-	-	1.0	0.0	0.0	-	-	0.0	1.2
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	7	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: New Street & Martha Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (12:15 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: New Street & Martha Street
Site Code: 200116
Start Date: 03/03/2020

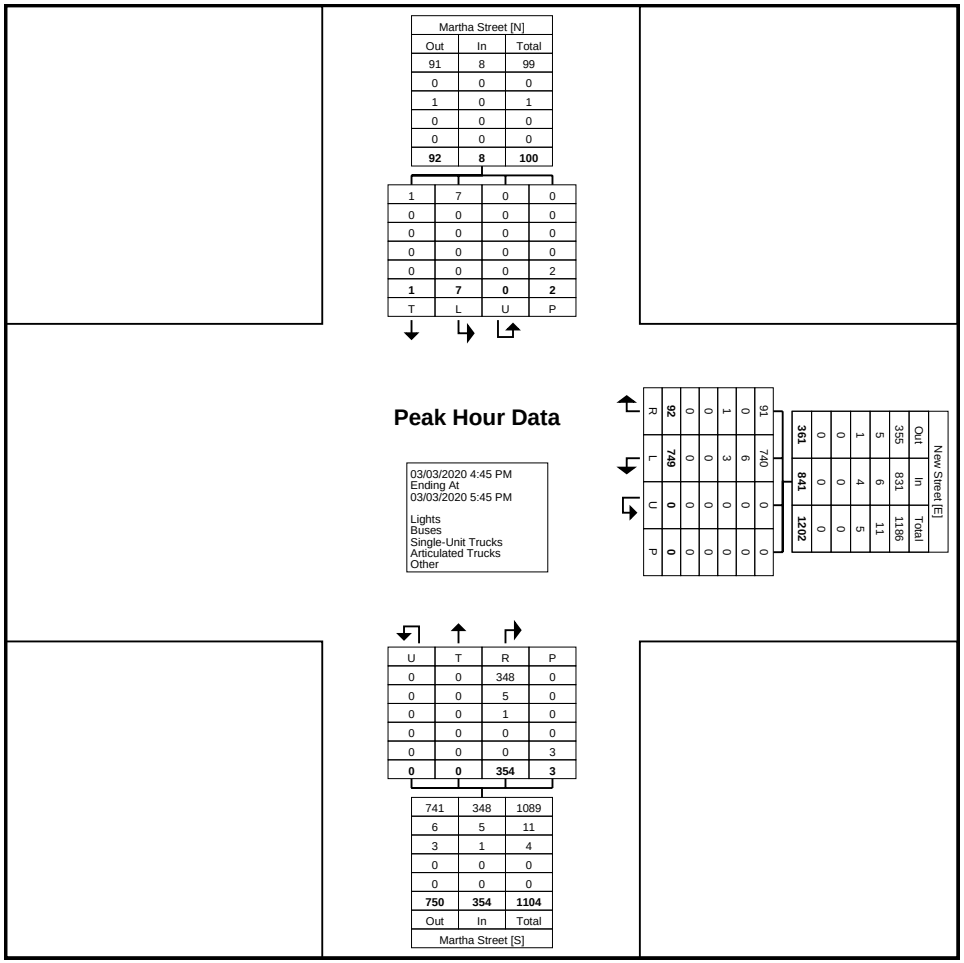
Turning Movement Peak Hour Data (4:45 PM)

Start Time	New Street Westbound					Martha Street Northbound					Martha Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
4:45 PM	186	14	0	0	200	0	80	0	1	80	0	1	0	1	1	281
5:00 PM	172	22	0	0	194	0	89	0	0	89	1	0	0	1	1	284
5:15 PM	208	29	0	0	237	0	89	0	2	89	5	0	0	0	5	331
5:30 PM	183	27	0	0	210	0	96	0	0	96	1	0	0	0	1	307
Total	749	92	0	0	841	0	354	0	3	354	7	1	0	2	8	1203
Approach %	89.1	10.9	0.0	-	-	0.0	100.0	0.0	-	-	87.5	12.5	0.0	-	-	-
Total %	62.3	7.6	0.0	-	69.9	0.0	29.4	0.0	-	29.4	0.6	0.1	0.0	-	0.7	-
PHF	0.900	0.793	0.000	-	0.887	0.000	0.922	0.000	-	0.922	0.350	0.250	0.000	-	0.400	0.909
Lights	740	91	0	-	831	0	348	0	-	348	7	1	0	-	8	1187
% Lights	98.8	98.9	-	-	98.8	-	98.3	-	-	98.3	100.0	100.0	-	-	100.0	98.7
Buses	6	0	0	-	6	0	5	0	-	5	0	0	0	-	0	11
% Buses	0.8	0.0	-	-	0.7	-	1.4	-	-	1.4	0.0	0.0	-	-	0.0	0.9
Single-Unit Trucks	3	1	0	-	4	0	1	0	-	1	0	0	0	-	0	5
% Single-Unit Trucks	0.4	1.1	-	-	0.5	-	0.3	-	-	0.3	0.0	0.0	-	-	0.0	0.4
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	66.7	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	33.3	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: New Street & Martha Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (4:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: New Street & Martha Street
Site Code: 200116
Start Date: 03/03/2020

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Pearl Street & Lakeshore Road
Site Code:
Start Date: 11/20/2018

Turning Movement Data

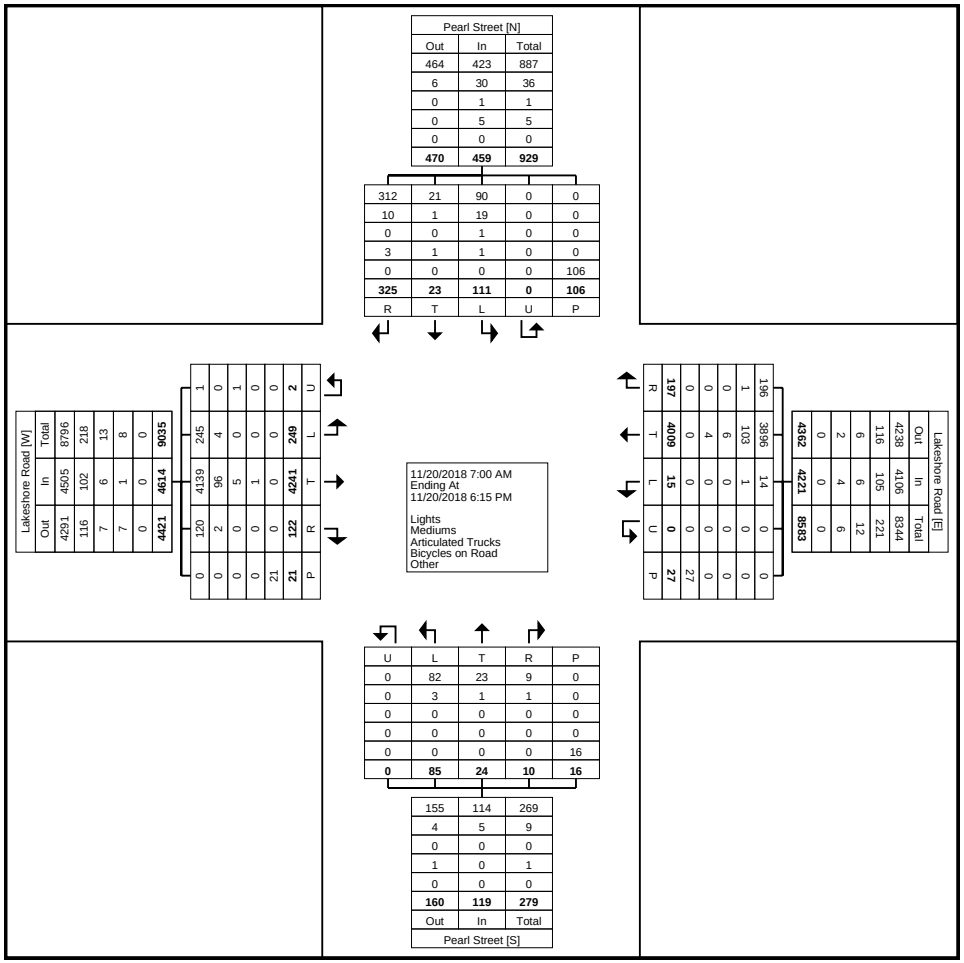
Start Time	Lakeshore Road Eastbound						Lakeshore Road Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	6	213	0	0	1	219	0	65	2	0	0	67	0	0	0	0	0	0	0	0	6	0	1	6	292
7:15 AM	2	229	1	0	0	232	0	94	2	0	2	96	0	0	0	0	0	0	0	1	3	0	3	4	332
7:30 AM	6	198	4	0	0	208	0	111	4	0	0	115	0	0	0	0	0	0	4	0	8	0	0	12	335
7:45 AM	5	180	3	0	0	188	0	114	7	0	0	121	4	0	0	0	0	4	6	0	13	0	1	19	332
Hourly Total	19	820	8	0	1	847	0	384	15	0	2	399	4	0	0	0	0	4	10	1	30	0	5	41	1291
8:00 AM	7	244	1	0	0	252	0	132	1	0	1	133	0	0	1	0	0	1	3	0	15	0	2	18	404
8:15 AM	12	219	7	0	0	238	0	136	8	0	1	144	0	0	0	0	0	0	2	1	10	0	4	13	395
8:30 AM	8	209	7	0	0	224	1	116	11	0	0	128	0	0	0	0	0	0	1	0	6	0	6	7	359
8:45 AM	11	193	8	0	0	212	0	120	7	0	0	127	0	1	0	0	0	1	4	0	14	0	8	18	358
Hourly Total	38	865	23	0	0	926	1	504	27	0	2	532	0	1	1	0	0	2	10	1	45	0	20	56	1516
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	6	81	6	0	4	93	0	118	6	0	1	124	6	1	0	0	3	7	4	1	7	0	3	12	236
11:15 AM	6	118	6	1	1	131	1	100	3	0	4	104	2	1	0	0	3	3	7	2	10	0	8	19	257
11:30 AM	6	102	5	0	1	113	0	129	7	0	2	136	5	1	0	0	0	6	4	3	6	0	1	13	268
11:45 AM	11	104	7	0	2	122	1	102	7	0	4	110	5	1	0	0	1	6	6	2	6	0	6	14	252
Hourly Total	29	405	24	1	8	459	2	449	23	0	11	474	18	4	0	0	7	22	21	8	29	0	18	58	1013
12:00 PM	7	122	4	0	0	133	2	110	10	0	1	122	2	1	0	0	0	3	2	1	10	0	0	13	271
12:15 PM	10	91	7	0	1	108	0	119	8	0	0	127	0	0	1	0	2	1	5	0	16	0	2	21	257
12:30 PM	10	101	4	0	0	115	1	134	8	0	0	143	5	0	1	0	0	6	4	1	10	0	0	15	279
12:45 PM	10	130	8	0	3	148	0	123	12	0	0	135	5	1	1	0	0	7	4	1	16	0	1	21	311
Hourly Total	37	444	23	0	4	504	3	486	38	0	1	527	12	2	3	0	2	17	15	3	52	0	3	70	1118
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	13	147	3	0	0	163	1	147	3	0	1	151	4	0	0	0	0	4	4	0	14	0	4	18	336
3:15 PM	12	130	3	0	1	145	0	188	3	0	0	191	1	1	1	0	2	3	2	1	7	0	7	10	349
3:30 PM	15	135	3	0	1	153	0	190	8	0	5	198	7	0	0	0	1	7	5	1	9	0	8	15	373
3:45 PM	6	139	8	0	0	153	1	193	8	0	1	202	6	0	0	0	0	6	8	1	14	0	7	23	384
Hourly Total	46	551	17	0	2	614	2	718	22	0	7	742	18	1	1	0	3	20	19	3	44	0	26	66	1442
4:00 PM	12	141	6	1	0	160	0	213	4	0	0	217	4	0	1	0	1	5	9	1	18	0	2	28	410
4:15 PM	13	143	4	0	3	160	1	166	5	0	1	172	2	1	1	0	0	4	5	0	20	0	6	25	361
4:30 PM	7	147	3	0	0	157	0	153	18	0	1	171	6	5	0	0	0	11	2	0	20	0	3	22	361
4:45 PM	6	153	3	0	0	162	1	161	14	0	0	176	7	1	0	0	1	8	7	2	18	0	2	27	373
Hourly Total	38	584	16	1	3	639	2	693	41	0	2	736	19	7	2	0	2	28	23	3	76	0	13	102	1505
5:00 PM	11	164	2	0	0	177	0	209	14	0	2	223	8	3	0	0	0	11	3	1	11	0	5	15	426

5:15 PM	9	156	1	0	2	166	2	204	9	0	0	215	3	4	0	0	1	7	4	0	6	0	9	10	398
5:30 PM	11	139	3	0	0	153	2	190	5	0	0	197	0	1	1	0	1	2	4	1	16	0	4	21	373
5:45 PM	11	113	5	0	1	129	1	172	3	0	0	176	3	1	2	0	0	6	2	2	16	0	3	20	331
Hourly Total	42	572	11	0	3	625	5	775	31	0	2	811	14	9	3	0	2	26	13	4	49	0	21	66	1528
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	249	4241	122	2	21	4614	15	4009	197	0	27	4221	85	24	10	0	16	119	111	23	325	0	106	459	9413
Approach %	5.4	91.9	2.6	0.0	-	-	0.4	95.0	4.7	0.0	-	-	71.4	20.2	8.4	0.0	-	-	24.2	5.0	70.8	0.0	-	-	-
Total %	2.6	45.1	1.3	0.0	-	49.0	0.2	42.6	2.1	0.0	-	44.8	0.9	0.3	0.1	0.0	-	1.3	1.2	0.2	3.5	0.0	-	4.9	-
Lights	245	4139	120	1	-	4505	14	3896	196	0	-	4106	82	23	9	0	-	114	90	21	312	0	-	423	9148
% Lights	98.4	97.6	98.4	50.0	-	97.6	93.3	97.2	99.5	-	-	97.3	96.5	95.8	90.0	-	-	95.8	81.1	91.3	96.0	-	-	92.2	97.2
Mediums	4	96	2	0	-	102	1	103	1	0	-	105	3	1	1	0	-	5	19	1	10	0	-	30	242
% Mediums	1.6	2.3	1.6	0.0	-	2.2	6.7	2.6	0.5	-	-	2.5	3.5	4.2	10.0	-	-	4.2	17.1	4.3	3.1	-	-	6.5	2.6
Articulated Trucks	0	5	0	1	-	6	0	6	0	0	-	6	0	0	0	0	-	0	1	0	0	0	-	1	13
% Articulated Trucks	0.0	0.1	0.0	50.0	-	0.1	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.9	0.0	0.0	-	-	0.2	0.1
Bicycles on Road	0	1	0	0	-	1	0	4	0	0	-	4	0	0	0	0	-	0	1	1	3	0	-	5	10
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.9	4.3	0.9	-	-	1.1	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	21	-	-	-	-	-	27	-	-	-	-	-	16	-	-	-	-	-	106	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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Count Name: Pearl Street & Lakeshore Road
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Start Date: 11/20/2018



Turning Movement Data Plot

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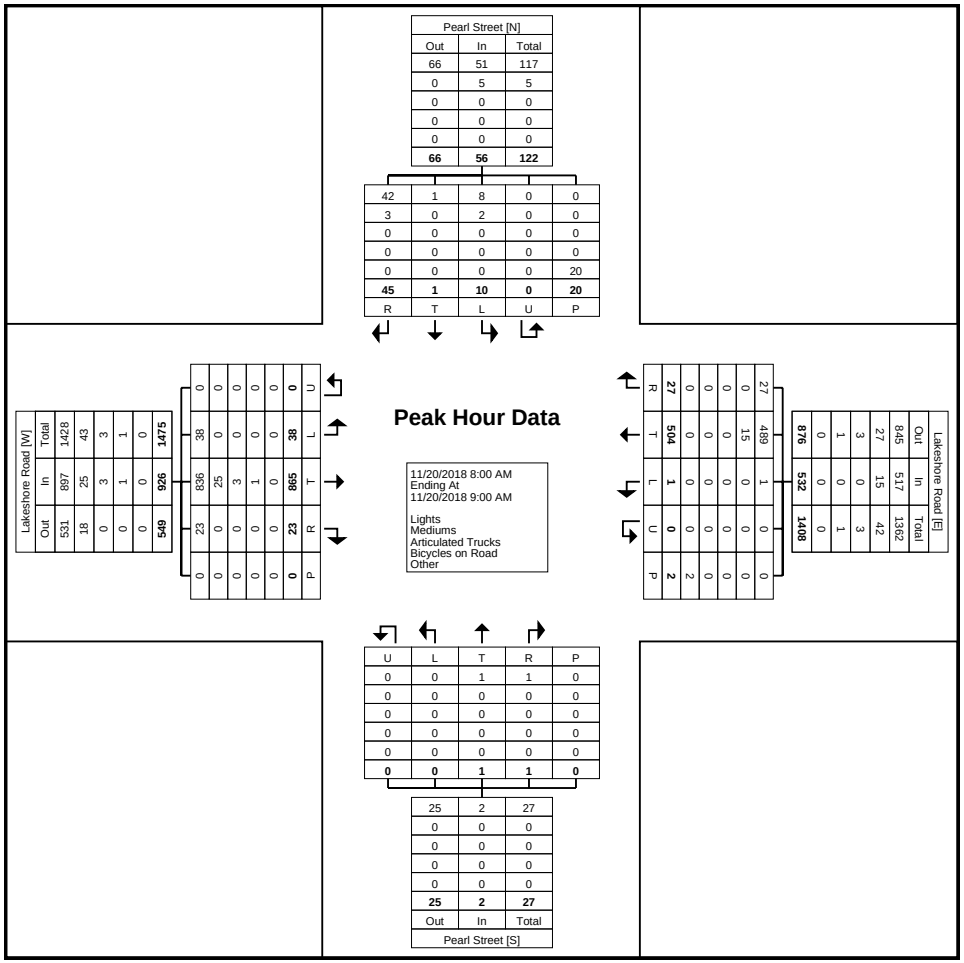
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Lakeshore Road Eastbound						Lakeshore Road Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	7	244	1	0	0	252	0	132	1	0	1	133	0	0	1	0	0	1	3	0	15	0	2	18	404
8:15 AM	12	219	7	0	0	238	0	136	8	0	1	144	0	0	0	0	0	0	2	1	10	0	4	13	395
8:30 AM	8	209	7	0	0	224	1	116	11	0	0	128	0	0	0	0	0	0	1	0	6	0	6	7	359
8:45 AM	11	193	8	0	0	212	0	120	7	0	0	127	0	1	0	0	0	1	4	0	14	0	8	18	358
Total	38	865	23	0	0	926	1	504	27	0	2	532	0	1	1	0	0	2	10	1	45	0	20	56	1516
Approach %	4.1	93.4	2.5	0.0	-	-	0.2	94.7	5.1	0.0	-	-	0.0	50.0	50.0	0.0	-	-	17.9	1.8	80.4	0.0	-	-	-
Total %	2.5	57.1	1.5	0.0	-	61.1	0.1	33.2	1.8	0.0	-	35.1	0.0	0.1	0.1	0.0	-	0.1	0.7	0.1	3.0	0.0	-	3.7	-
PHF	0.792	0.886	0.719	0.000	-	0.919	0.250	0.926	0.614	0.000	-	0.924	0.000	0.250	0.250	0.000	-	0.500	0.625	0.250	0.750	0.000	-	0.778	0.938
Lights	38	836	23	0	-	897	1	489	27	0	-	517	0	1	1	0	-	2	8	1	42	0	-	51	1467
% Lights	100.0	96.6	100.0	-	-	96.9	100.0	97.0	100.0	-	-	97.2	-	100.0	100.0	-	-	100.0	80.0	100.0	93.3	-	-	91.1	96.8
Mediums	0	25	0	0	-	25	0	15	0	0	-	15	0	0	0	0	-	0	2	0	3	0	-	5	45
% Mediums	0.0	2.9	0.0	-	-	2.7	0.0	3.0	0.0	-	-	2.8	-	0.0	0.0	-	-	0.0	20.0	0.0	6.7	-	-	8.9	3.0
Articulated Trucks	0	3	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	3
% Articulated Trucks	0.0	0.3	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	20	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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Turning Movement Peak Hour Data Plot (8:00 AM)

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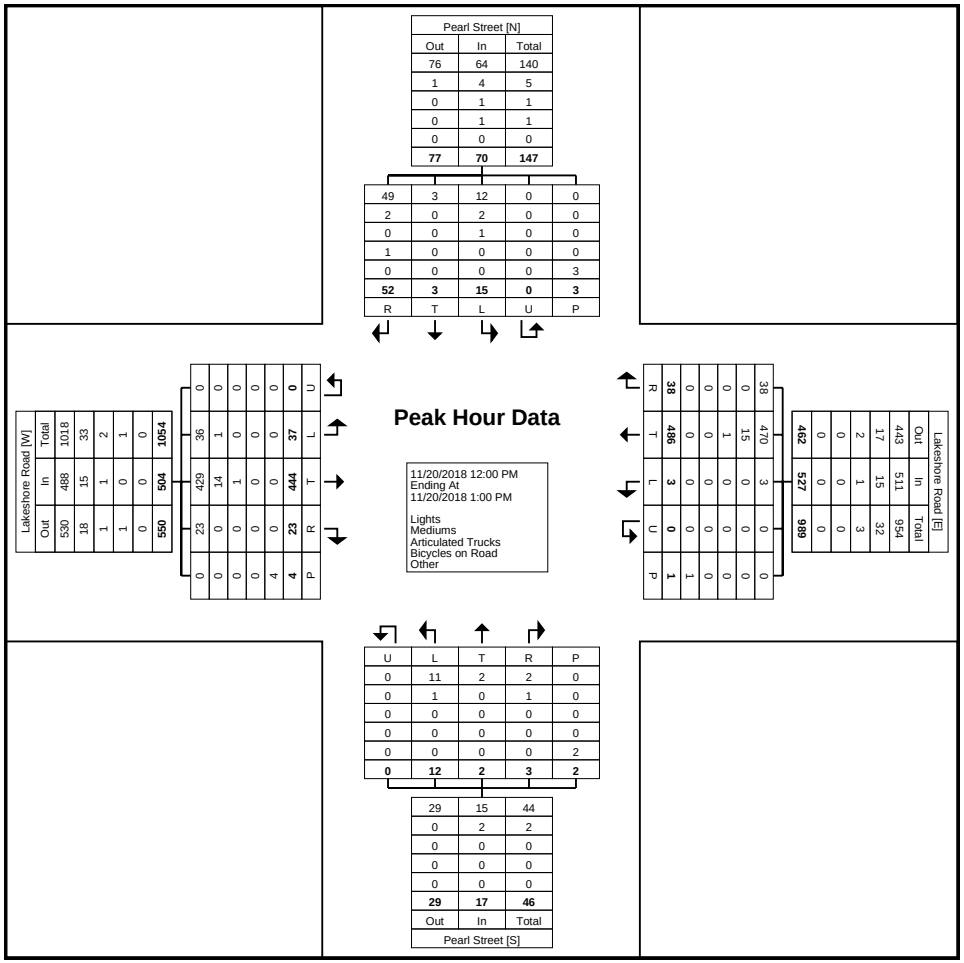
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Lakeshore Road Eastbound						Lakeshore Road Westbound						Pearl Street Northbound						Pearl Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	7	122	4	0	0	133	2	110	10	0	1	122	2	1	0	0	0	3	2	1	10	0	0	13	271
12:15 PM	10	91	7	0	1	108	0	119	8	0	0	127	0	0	1	0	2	1	5	0	16	0	2	21	257
12:30 PM	10	101	4	0	0	115	1	134	8	0	0	143	5	0	1	0	0	6	4	1	10	0	0	15	279
12:45 PM	10	130	8	0	3	148	0	123	12	0	0	135	5	1	1	0	0	7	4	1	16	0	1	21	311
Total	37	444	23	0	4	504	3	486	38	0	1	527	12	2	3	0	2	17	15	3	52	0	3	70	1118
Approach %	7.3	88.1	4.6	0.0	-	-	0.6	92.2	7.2	0.0	-	-	70.6	11.8	17.6	0.0	-	-	21.4	4.3	74.3	0.0	-	-	-
Total %	3.3	39.7	2.1	0.0	-	45.1	0.3	43.5	3.4	0.0	-	47.1	1.1	0.2	0.3	0.0	-	1.5	1.3	0.3	4.7	0.0	-	6.3	-
PHF	0.925	0.854	0.719	0.000	-	0.851	0.375	0.907	0.792	0.000	-	0.921	0.600	0.500	0.750	0.000	-	0.607	0.750	0.750	0.813	0.000	-	0.833	0.899
Lights	36	429	23	0	-	488	3	470	38	0	-	511	11	2	2	0	-	15	12	3	49	0	-	64	1078
% Lights	97.3	96.6	100.0	-	-	96.8	100.0	96.7	100.0	-	-	97.0	91.7	100.0	66.7	-	-	88.2	80.0	100.0	94.2	-	-	91.4	96.4
Mediums	1	14	0	0	-	15	0	15	0	0	-	15	1	0	1	0	-	2	2	0	2	0	-	4	36
% Mediums	2.7	3.2	0.0	-	-	3.0	0.0	3.1	0.0	-	-	2.8	8.3	0.0	33.3	-	-	11.8	13.3	0.0	3.8	-	-	5.7	3.2
Articulated Trucks	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	1	0	0	0	-	1	3
% Articulated Trucks	0.0	0.2	0.0	-	-	0.2	0.0	0.2	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	6.7	0.0	0.0	-	-	1.4	0.3
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.9	-	-	1.4	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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Turning Movement Peak Hour Data Plot (12:00 PM)

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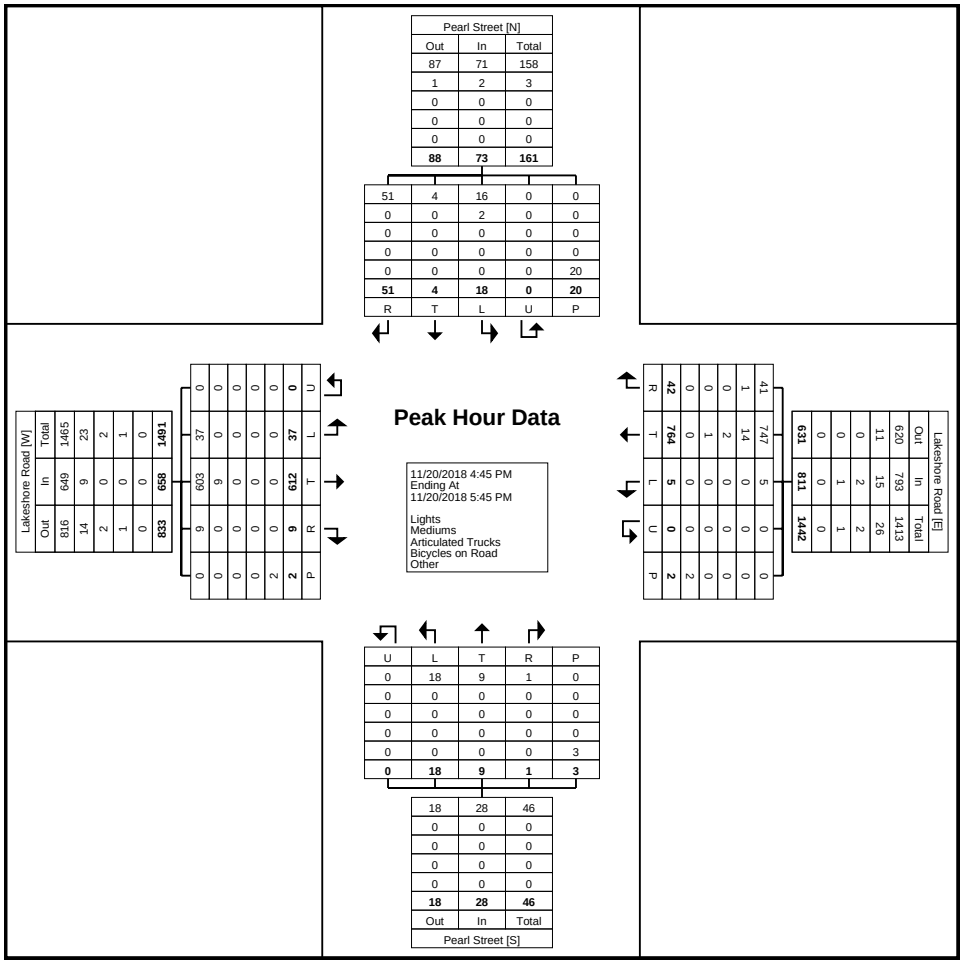
Turning Movement Peak Hour Data (4:45 PM)

Start Time	Lakeshore Road Eastbound						Lakeshore Road Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	6	153	3	0	0	162	1	161	14	0	0	176	7	1	0	0	1	8	7	2	18	0	2	27	373
5:00 PM	11	164	2	0	0	177	0	209	14	0	2	223	8	3	0	0	0	11	3	1	11	0	5	15	426
5:15 PM	9	156	1	0	2	166	2	204	9	0	0	215	3	4	0	0	1	7	4	0	6	0	9	10	398
5:30 PM	11	139	3	0	0	153	2	190	5	0	0	197	0	1	1	0	1	2	4	1	16	0	4	21	373
Total	37	612	9	0	2	658	5	764	42	0	2	811	18	9	1	0	3	28	18	4	51	0	20	73	1570
Approach %	5.6	93.0	1.4	0.0	-	-	0.6	94.2	5.2	0.0	-	-	64.3	32.1	3.6	0.0	-	-	24.7	5.5	69.9	0.0	-	-	-
Total %	2.4	39.0	0.6	0.0	-	41.9	0.3	48.7	2.7	0.0	-	51.7	1.1	0.6	0.1	0.0	-	1.8	1.1	0.3	3.2	0.0	-	4.6	-
PHF	0.841	0.933	0.750	0.000	-	0.929	0.625	0.914	0.750	0.000	-	0.909	0.563	0.563	0.250	0.000	-	0.636	0.643	0.500	0.708	0.000	-	0.676	0.921
Lights	37	603	9	0	-	649	5	747	41	0	-	793	18	9	1	0	-	28	16	4	51	0	-	71	1541
% Lights	100.0	98.5	100.0	-	-	98.6	100.0	97.8	97.6	-	-	97.8	100.0	100.0	100.0	-	-	100.0	88.9	100.0	100.0	-	-	97.3	98.2
Mediums	0	9	0	0	-	9	0	14	1	0	-	15	0	0	0	0	-	0	2	0	0	0	-	2	26
% Mediums	0.0	1.5	0.0	-	-	1.4	0.0	1.8	2.4	-	-	1.8	0.0	0.0	0.0	-	-	0.0	11.1	0.0	0.0	-	-	2.7	1.7
Articulated Trucks	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.3	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-	20	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Pearl Street & Lakeshore Road
Site Code:
Start Date: 11/20/2018



Turning Movement Peak Hour Data Plot (4:45 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Pearl Street & Lakeshore Road
Site Code:
Start Date: 11/20/2018

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Pine Street& Pearl Street
Site Code: 200116
Start Date: 03/03/2020

Turning Movement Data

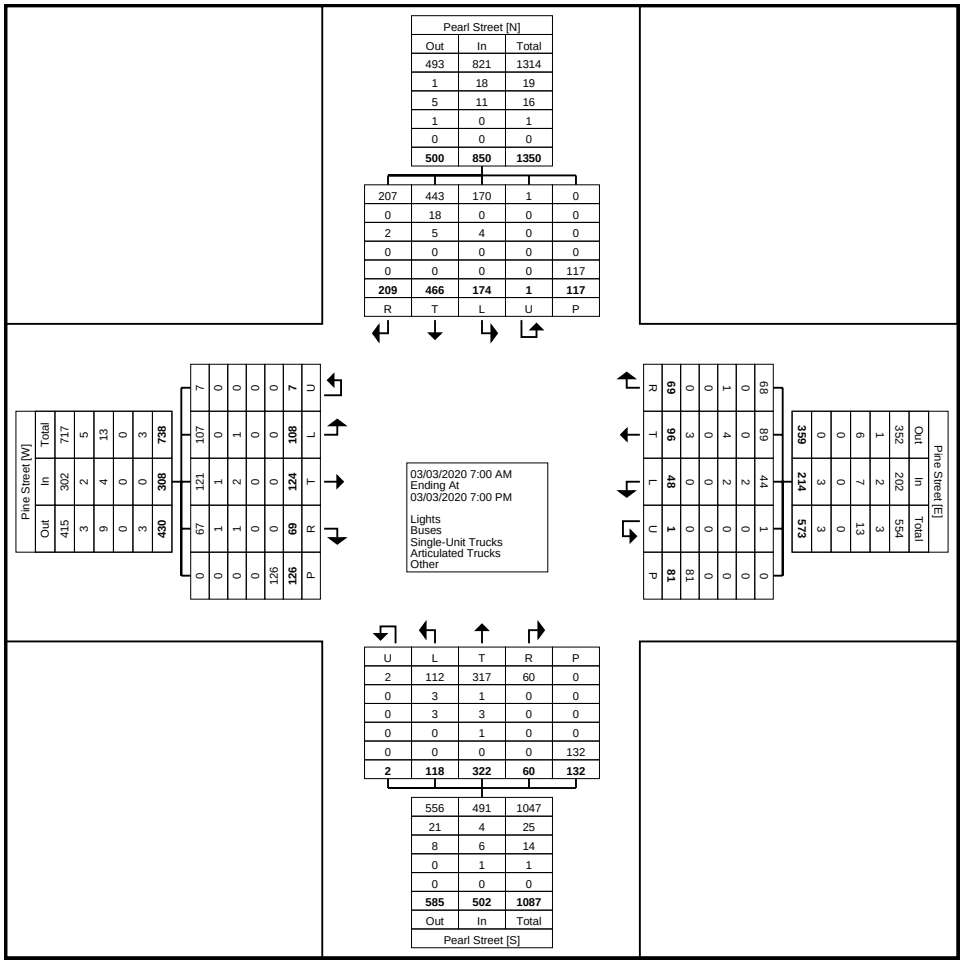
Start Time	Pine Street Eastbound						Pine Street Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	2	0	0	0	3	2	0	1	0	0	1	1	1	7	1	0	2	9	1	5	3	0	1	9	21
7:15 AM	4	1	1	0	5	6	0	0	1	0	1	1	0	8	0	0	0	8	1	10	5	0	3	16	31
7:30 AM	1	2	1	0	1	4	1	1	0	0	0	2	3	6	1	0	3	10	1	5	1	0	1	7	23
7:45 AM	2	0	0	0	2	2	1	2	2	0	1	5	2	8	3	0	3	13	2	11	1	0	1	14	34
Hourly Total	9	3	2	0	11	14	2	4	3	0	3	9	6	29	5	0	8	40	5	31	10	0	6	46	109
8:00 AM	1	6	1	0	1	8	0	2	0	0	0	2	3	6	0	0	1	9	2	13	4	0	2	19	38
8:15 AM	3	3	0	1	3	7	0	4	1	0	2	5	4	10	2	0	3	16	5	18	6	0	1	29	57
8:30 AM	3	5	2	0	2	10	1	2	2	0	1	5	3	15	0	0	1	18	3	14	5	0	2	22	55
8:45 AM	2	6	1	0	4	9	1	4	3	0	2	8	1	10	3	0	6	14	10	8	9	0	3	27	58
Hourly Total	9	20	4	1	10	34	2	12	6	0	5	20	11	41	5	0	11	57	20	53	24	0	8	97	208
9:00 AM	0	3	2	0	2	5	1	2	0	0	1	3	5	10	1	0	4	16	3	8	3	0	5	14	38
9:15 AM	4	1	4	0	2	9	0	1	3	0	0	4	4	12	2	0	4	18	8	15	5	0	1	28	59
9:30 AM	2	3	1	0	2	6	1	4	2	0	1	7	4	6	3	0	2	13	3	5	3	0	4	11	37
9:45 AM	0	5	2	0	7	7	2	1	3	0	2	6	4	12	1	0	5	17	5	13	3	0	6	21	51
Hourly Total	6	12	9	0	13	27	4	8	8	0	4	20	17	40	7	0	15	64	19	41	14	0	16	74	185
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	6	4	3	0	7	13	4	3	1	0	6	8	5	12	3	0	5	20	2	9	10	0	5	21	62
11:45 AM	6	8	6	0	4	20	1	4	3	0	2	8	4	11	4	0	5	19	6	16	11	0	1	33	80
Hourly Total	12	12	9	0	11	33	5	7	4	0	8	16	9	23	7	0	10	39	8	25	21	0	6	54	142
12:00 PM	5	6	3	0	9	14	2	4	2	0	3	8	1	7	1	0	6	9	8	12	6	0	2	26	57
12:15 PM	4	5	4	1	7	14	4	4	2	0	4	10	3	17	0	0	7	20	2	17	13	0	4	32	76
12:30 PM	11	3	2	0	2	16	5	5	4	0	4	14	3	9	6	0	4	18	11	11	10	0	6	32	80
12:45 PM	1	6	3	0	8	10	1	8	3	0	3	12	6	8	1	0	4	15	10	27	10	0	3	47	84
Hourly Total	21	20	12	1	26	54	12	21	11	0	14	44	13	41	8	0	21	62	31	67	39	0	15	137	297
1:00 PM	4	7	3	1	4	15	1	3	1	0	3	5	4	9	2	0	10	15	13	14	14	0	4	41	76
1:15 PM	2	5	3	0	8	10	2	6	2	0	9	10	3	13	6	2	10	24	3	20	10	0	7	33	77
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	6	12	6	1	12	25	3	9	3	0	12	15	7	22	8	2	20	39	16	34	24	0	11	74	153
4:00 PM	1	5	4	1	6	11	1	3	3	0	2	7	4	7	0	0	2	11	5	31	4	0	3	40	69
4:15 PM	2	8	4	1	2	15	1	5	1	0	2	7	5	8	2	0	4	15	9	17	5	0	3	31	68
4:30 PM	3	4	3	0	9	10	4	1	4	0	3	9	3	7	5	0	5	15	6	27	10	0	7	43	77
4:45 PM	6	4	2	0	4	12	0	2	5	0	1	7	9	12	2	0	1	23	9	15	7	0	2	31	73
Hourly Total	12	21	13	2	21	48	6	11	13	0	8	30	21	34	9	0	12	64	29	90	26	0	15	145	287
5:00 PM	3	1	0	0	2	4	3	3	4	0	1	10	5	11	2	0	7	18	4	22	5	0	6	31	63
5:15 PM	0	4	3	0	2	7	0	6	2	1	1	9	8	14	1	0	5	23	10	25	8	0	1	43	82

5:30 PM	8	5	6	0	2	19	2	6	3	0	1	11	6	10	0	0	5	16	5	17	13	0	4	35	81
5:45 PM	8	7	0	0	6	15	2	0	2	0	4	4	3	14	2	0	4	19	6	20	7	0	7	33	71
Hourly Total	19	17	9	0	12	45	7	15	11	1	7	34	22	49	5	0	21	76	25	84	33	0	18	142	297
6:00 PM	8	2	2	0	3	12	2	4	2	0	0	8	3	9	0	0	1	12	3	7	4	1	7	15	47
6:15 PM	3	4	2	2	3	11	2	2	3	0	5	7	4	8	2	0	5	14	7	8	3	0	5	18	50
6:30 PM	0	0	1	0	2	1	3	3	1	0	2	7	2	10	2	0	4	14	5	11	4	0	2	20	42
6:45 PM	3	1	0	0	2	4	0	0	4	0	13	4	3	16	2	0	4	21	6	15	7	0	8	28	57
Hourly Total	14	7	5	2	10	28	7	9	10	0	20	26	12	43	6	0	14	61	21	41	18	1	22	81	196
Grand Total	108	124	69	7	126	308	48	96	69	1	81	214	118	322	60	2	132	502	174	466	209	1	117	850	1874
Approach %	35.1	40.3	22.4	2.3	-	-	22.4	44.9	32.2	0.5	-	-	23.5	64.1	12.0	0.4	-	-	20.5	54.8	24.6	0.1	-	-	-
Total %	5.8	6.6	3.7	0.4	-	16.4	2.6	5.1	3.7	0.1	-	11.4	6.3	17.2	3.2	0.1	-	26.8	9.3	24.9	11.2	0.1	-	45.4	-
Lights	107	121	67	7	-	302	44	89	68	1	-	202	112	317	60	2	-	491	170	443	207	1	-	821	1816
% Lights	99.1	97.6	97.1	100.0	-	98.1	91.7	92.7	98.6	100.0	-	94.4	94.9	98.4	100.0	100.0	-	97.8	97.7	95.1	99.0	100.0	-	96.6	96.9
Buses	0	1	1	0	-	2	2	0	0	0	-	2	3	1	0	0	-	4	0	18	0	0	-	18	26
% Buses	0.0	0.8	1.4	0.0	-	0.6	4.2	0.0	0.0	0.0	-	0.9	2.5	0.3	0.0	0.0	-	0.8	0.0	3.9	0.0	0.0	-	2.1	1.4
Single-Unit Trucks	1	2	1	0	-	4	2	4	1	0	-	7	3	3	0	0	-	6	4	5	2	0	-	11	28
% Single-Unit Trucks	0.9	1.6	1.4	0.0	-	1.3	4.2	4.2	1.4	0.0	-	3.3	2.5	0.9	0.0	0.0	-	1.2	2.3	1.1	1.0	0.0	-	1.3	1.5
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.3	0.0	0.0	-	0.2	0.0	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Road	0	0	0	0	-	0	0	3	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	3
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	3.1	0.0	0.0	-	1.4	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	126	-	-	-	-	-	81	-	-	-	-	-	132	-	-	-	-	-	117	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Pine Street& Pearl Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Pine Street& Pearl Street
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Start Date: 03/03/2020

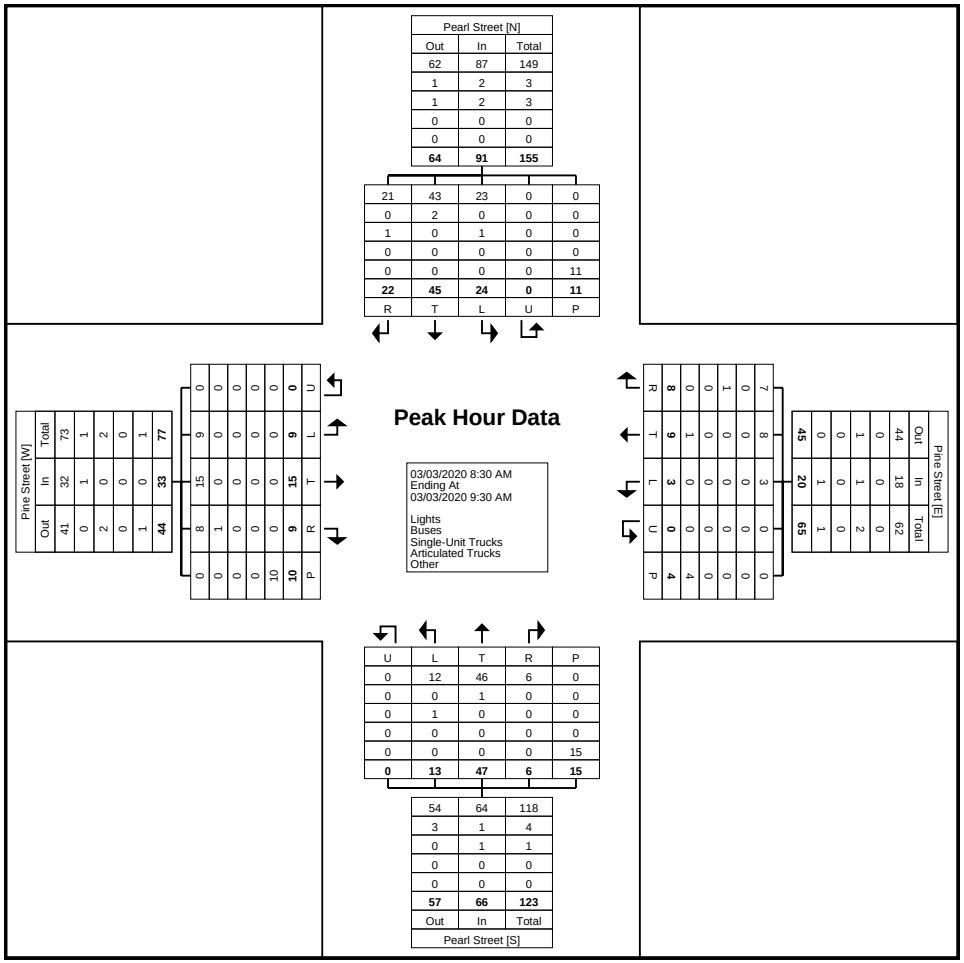
Turning Movement Peak Hour Data (8:30 AM)

Start Time	Pine Street Eastbound						Pine Street Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:30 AM	3	5	2	0	2	10	1	2	2	0	1	5	3	15	0	0	1	18	3	14	5	0	2	22	55
8:45 AM	2	6	1	0	4	9	1	4	3	0	2	8	1	10	3	0	6	14	10	8	9	0	3	27	58
9:00 AM	0	3	2	0	2	5	1	2	0	0	1	3	5	10	1	0	4	16	3	8	3	0	5	14	38
9:15 AM	4	1	4	0	2	9	0	1	3	0	0	4	4	12	2	0	4	18	8	15	5	0	1	28	59
Total	9	15	9	0	10	33	3	9	8	0	4	20	13	47	6	0	15	66	24	45	22	0	11	91	210
Approach %	27.3	45.5	27.3	0.0	-	-	15.0	45.0	40.0	0.0	-	-	19.7	71.2	9.1	0.0	-	-	26.4	49.5	24.2	0.0	-	-	-
Total %	4.3	7.1	4.3	0.0	-	15.7	1.4	4.3	3.8	0.0	-	9.5	6.2	22.4	2.9	0.0	-	31.4	11.4	21.4	10.5	0.0	-	43.3	-
PHF	0.563	0.625	0.563	0.000	-	0.825	0.750	0.563	0.667	0.000	-	0.625	0.650	0.783	0.500	0.000	-	0.917	0.600	0.750	0.611	0.000	-	0.813	0.890
Lights	9	15	8	0	-	32	3	8	7	0	-	18	12	46	6	0	-	64	23	43	21	0	-	87	201
% Lights	100.0	100.0	88.9	-	-	97.0	100.0	88.9	87.5	-	-	90.0	92.3	97.9	100.0	-	-	97.0	95.8	95.6	95.5	-	-	95.6	95.7
Buses	0	0	1	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	0	2	0	0	-	2	4
% Buses	0.0	0.0	11.1	-	-	3.0	0.0	0.0	0.0	-	-	0.0	0.0	2.1	0.0	-	-	1.5	0.0	4.4	0.0	-	-	2.2	1.9
Single-Unit Trucks	0	0	0	0	-	0	0	0	1	0	-	1	1	0	0	0	-	1	1	0	1	0	-	2	4
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	12.5	-	-	5.0	7.7	0.0	0.0	-	-	1.5	4.2	0.0	4.5	-	-	2.2	1.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	11.1	0.0	-	-	5.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.5
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	10	-	-	-	-	-	4	-	-	-	-	-	15	-	-	-	-	-	11	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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5A-150 Pinebush Rd

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Count Name: Pine Street& Pearl Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (8:30 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Pine Street& Pearl Street
Site Code: 200116
Start Date: 03/03/2020

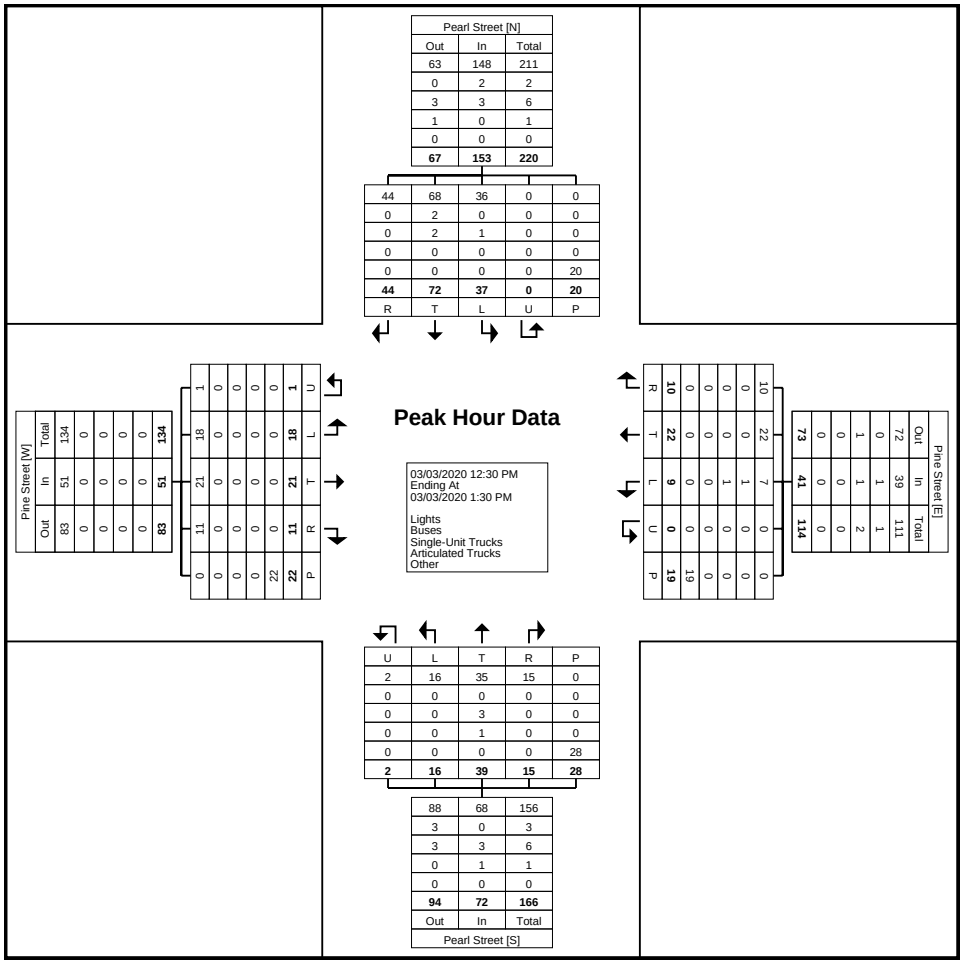
Turning Movement Peak Hour Data (12:30 PM)

Start Time	Pine Street Eastbound						Pine Street Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:30 PM	11	3	2	0	2	16	5	5	4	0	4	14	3	9	6	0	4	18	11	11	10	0	6	32	80
12:45 PM	1	6	3	0	8	10	1	8	3	0	3	12	6	8	1	0	4	15	10	27	10	0	3	47	84
1:00 PM	4	7	3	1	4	15	1	3	1	0	3	5	4	9	2	0	10	15	13	14	14	0	4	41	76
1:15 PM	2	5	3	0	8	10	2	6	2	0	9	10	3	13	6	2	10	24	3	20	10	0	7	33	77
Total	18	21	11	1	22	51	9	22	10	0	19	41	16	39	15	2	28	72	37	72	44	0	20	153	317
Approach %	35.3	41.2	21.6	2.0	-	-	22.0	53.7	24.4	0.0	-	-	22.2	54.2	20.8	2.8	-	-	24.2	47.1	28.8	0.0	-	-	-
Total %	5.7	6.6	3.5	0.3	-	16.1	2.8	6.9	3.2	0.0	-	12.9	5.0	12.3	4.7	0.6	-	22.7	11.7	22.7	13.9	0.0	-	48.3	-
PHF	0.409	0.750	0.917	0.250	-	0.797	0.450	0.688	0.625	0.000	-	0.732	0.667	0.750	0.625	0.250	-	0.750	0.712	0.667	0.786	0.000	-	0.814	0.943
Lights	18	21	11	1	-	51	7	22	10	0	-	39	16	35	15	2	-	68	36	68	44	0	-	148	306
% Lights	100.0	100.0	100.0	100.0	-	100.0	77.8	100.0	100.0	-	-	95.1	100.0	89.7	100.0	100.0	-	94.4	97.3	94.4	100.0	-	-	96.7	96.5
Buses	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	0	2	0	0	-	2	3
% Buses	0.0	0.0	0.0	0.0	-	0.0	11.1	0.0	0.0	-	-	2.4	0.0	0.0	0.0	0.0	-	0.0	0.0	2.8	0.0	-	-	1.3	0.9
Single-Unit Trucks	0	0	0	0	-	0	1	0	0	0	-	1	0	3	0	0	-	3	1	2	0	0	-	3	7
% Single-Unit Trucks	0.0	0.0	0.0	0.0	-	0.0	11.1	0.0	0.0	-	-	2.4	0.0	7.7	0.0	0.0	-	4.2	2.7	2.8	0.0	-	-	2.0	2.2
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	2.6	0.0	0.0	-	1.4	0.0	0.0	0.0	-	-	0.0	0.3
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	22	-	-	-	-	-	19	-	-	-	-	-	28	-	-	-	-	-	20	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Pine Street& Pearl Street
Site Code: 200116
Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (12:30 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Pine Street& Pearl Street
Site Code: 200116
Start Date: 03/03/2020

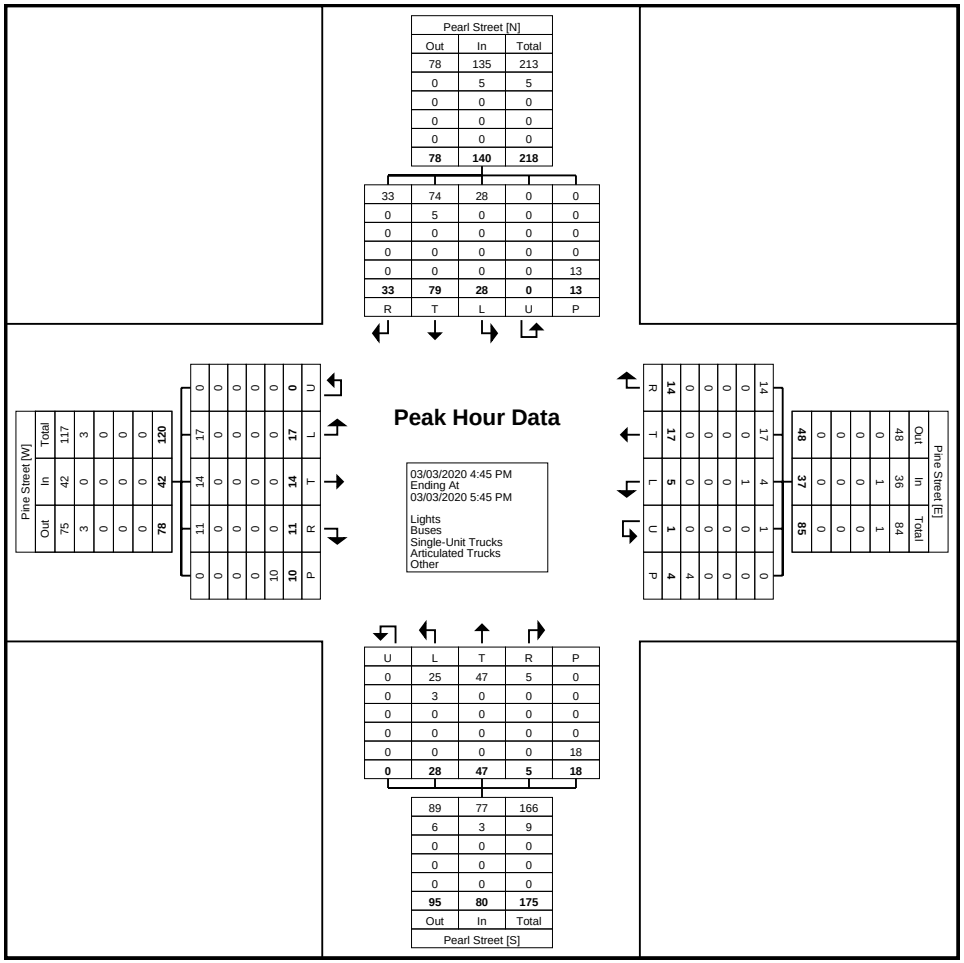
Turning Movement Peak Hour Data (4:45 PM)

Start Time	Pine Street Eastbound						Pine Street Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	6	4	2	0	4	12	0	2	5	0	1	7	9	12	2	0	1	23	9	15	7	0	2	31	73
5:00 PM	3	1	0	0	2	4	3	3	4	0	1	10	5	11	2	0	7	18	4	22	5	0	6	31	63
5:15 PM	0	4	3	0	2	7	0	6	2	1	1	9	8	14	1	0	5	23	10	25	8	0	1	43	82
5:30 PM	8	5	6	0	2	19	2	6	3	0	1	11	6	10	0	0	5	16	5	17	13	0	4	35	81
Total	17	14	11	0	10	42	5	17	14	1	4	37	28	47	5	0	18	80	28	79	33	0	13	140	299
Approach %	40.5	33.3	26.2	0.0	-	-	13.5	45.9	37.8	2.7	-	-	35.0	58.8	6.3	0.0	-	-	20.0	56.4	23.6	0.0	-	-	-
Total %	5.7	4.7	3.7	0.0	-	14.0	1.7	5.7	4.7	0.3	-	12.4	9.4	15.7	1.7	0.0	-	26.8	9.4	26.4	11.0	0.0	-	46.8	-
PHF	0.531	0.700	0.458	0.000	-	0.553	0.417	0.708	0.700	0.250	-	0.841	0.778	0.839	0.625	0.000	-	0.870	0.700	0.790	0.635	0.000	-	0.814	0.912
Lights	17	14	11	0	-	42	4	17	14	1	-	36	25	47	5	0	-	77	28	74	33	0	-	135	290
% Lights	100.0	100.0	100.0	-	-	100.0	80.0	100.0	100.0	100.0	-	97.3	89.3	100.0	100.0	-	-	96.3	100.0	93.7	100.0	-	-	96.4	97.0
Buses	0	0	0	0	-	0	1	0	0	0	-	1	3	0	0	0	-	3	0	5	0	0	-	5	9
% Buses	0.0	0.0	0.0	-	-	0.0	20.0	0.0	0.0	0.0	-	2.7	10.7	0.0	0.0	-	-	3.8	0.0	6.3	0.0	-	-	3.6	3.0
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	10	-	-	-	-	-	4	-	-	-	-	-	18	-	-	-	-	-	13	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Pine Street& Pearl Street
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Start Date: 03/03/2020



Turning Movement Peak Hour Data Plot (4:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Pine Street& Pearl Street
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Appendix C

Base Year Traffic Operations Reports

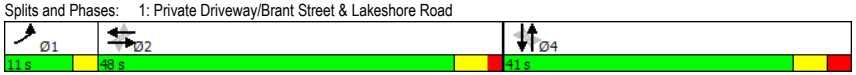
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	945	8	2	585	86	5	3	4	83	3	142
Future Volume (vph)	151	945	8	2	585	86	5	3	4	83	3	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	25.0		0.0	0.0		0.0	0.0		15.0
Storage Lanes	1		0	1		0	0		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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99			0.99		0.99	0.99	
Frt		0.999			0.981			0.955			0.853	
Flt Protected	0.950			0.950				0.980		0.950		
Satd. Flow (prot)	1547	1642	0	812	3019	0	0	1414	0	1608	1384	0
Flt Permitted	0.332			0.091				0.867		0.750		
Satd. Flow (perm)	537	1642	0	78	3019	0	0	1251	0	1263	1384	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			21			4			154	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			146.1			72.5			121.7	
Travel Time (s)		11.4			10.5			5.2			8.8	
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
Confl. Bikes (#/hr)			10			1						2
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 (%)	5%	4%	0%	100%	5%	5%	0%	50%	0%	1%	0%	4%
Adj. Flow (vph)	164	1027	9	2	636	93	5	3	4	90	3	154
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	1036	0	2	729	0	0	12	0	90	157	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Detector Phase	1	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.0	33.0		33.0	33.0		38.0	38.0		38.0	38.0	
Total Split (s)	11.0	48.0		48.0	48.0		41.0	41.0		41.0	41.0	
Total Split (%)	11.0%	48.0%		48.0%	48.0%		41.0%	41.0%		41.0%	41.0%	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	52.5	44.1		44.1	44.1			14.1		14.1	14.1	
Actuated g/C Ratio	0.69	0.58		0.58	0.58			0.18		0.18	0.18	
v/c Ratio	0.35	1.10		0.05	0.42			0.05		0.39	0.41	
Control Delay	5.9	79.2		11.5	10.2			21.8		32.7	8.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	5.9	79.2		11.5	10.2			21.8		32.7	8.8	
LOS	A	E		B	B			C		C	A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		69.2			10.2			21.8			17.5	
Approach LOS		E			B			C			B	
Queue Length 50th (m)	6.0	~182.9		0.1	28.8			1.0		12.3	0.4	
Queue Length 95th (m)	14.5	#281.3		1.3	47.7			5.4		25.8	15.3	
Internal Link Dist (m)		134.0			122.1			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	477	945		44	1746			607		611	749	
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	1.10		0.05	0.42			0.02		0.15	0.21	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 76.6			
Natural Cycle: 130			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 43.4		Intersection LOS: D	
Intersection Capacity Utilization 83.5%		ICU Level of Service E	
Analysis Period (min) 15			

~ 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.

Splits and Phases: 1: Private Driveway/Brant Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	945	8	2	585	86	5	3	4	83	3	142
Future Volume (vph)	151	945	8	2	585	86	5	3	4	83	3	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98			0.95		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1545	1642		812	3021			1414		1601	1383	
Flt Permitted	0.33	1.00		0.09	1.00			0.87		0.75	1.00	
Satd. Flow (perm)	540	1642		78	3021			1251		1264	1383	
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)	164	1027	9	2	636	93	5	3	4	90	3	154
RTOR Reduction (vph)	0	0	0	0	9	0	0	3	0	0	126	0
Lane Group Flow (vph)	164	1036	0	2	720	0	0	9	0	90	31	0
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
Confl. Bikes (#/hr)			10			1						2
Heavy Vehicles (%)	5%	4%	0%	100%	5%	5%	0%	50%	0%	1%	0%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Actuated Green, G (s)	49.5	42.1		42.1	42.1			11.1		11.1	11.1	
Effective Green, g (s)	49.5	44.1		44.1	44.1			14.1		14.1	14.1	
Actuated g/C Ratio	0.65	0.58		0.58	0.58			0.18		0.18	0.18	
Clearance Time (s)	3.0	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)	446	945		44	1739			230		232	254	
v/s Ratio Prot	c0.04	c0.63			0.24						0.02	
v/s Ratio Perm	0.20			0.03				0.01		c0.07		
v/c Ratio	0.37	1.10		0.05	0.41			0.04		0.39	0.12	
Uniform Delay, d1	5.6	16.2		7.1	9.1			25.7		27.5	26.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.5	59.0		1.9	0.7			0.1		1.1	0.2	
Delay (s)	6.1	75.3		9.0	9.8			25.7		28.5	26.3	
Level of Service	A	E		A	A			C		C	C	
Approach Delay (s)		65.8			9.8			25.7			27.1	
Approach LOS		E			A			C			C	

Intersection Summary				
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	76.6	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	83.5%	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)	39	923	5	15	557	10	3	0	8	13	1	38
Future Volume (vph)	39	923	5	15	557	10	3	0	8	13	1	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	25.0		0.0	0.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			1.00			0.98	
Frt		0.999			0.997			0.899			0.854	
Flt Protected	0.950			0.950				0.988		0.950		
Satd. Flow (prot)	1504	1689	0	1015	3169	0	0	1182	0	1321	1159	0
Flt Permitted	0.419			0.237				0.904		0.750		
Satd. Flow (perm)	656	1689	0	253	3169	0	0	1079	0	1043	1159	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			40			41	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		146.1			118.3			58.9			56.3	
Travel Time (s)		10.5			8.5			4.2			4.1	
Confl. Peds. (#/hr)	16		21	21		16	7					7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	1%	20%	60%	2%	10%	0%	0%	38%	23%	0%	24%
Adj. Flow (vph)	42	1003	5	16	605	11	3	0	9	14	1	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	1008	0	16	616	0	0	12	0	14	42	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		33.0	33.0		33.0	33.0	
Total Split (s)	75.0	75.0		75.0	75.0		35.0	35.0		35.0	35.0	
Total Split (%)	68.2%	68.2%		68.2%	68.2%		31.8%	31.8%		31.8%	31.8%	
Yellow Time (s)	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	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	80.5	80.5		80.5	80.5			11.3		11.3	11.3	
Actuated g/C Ratio	0.88	0.88		0.88	0.88			0.12		0.12	0.12	
v/c Ratio	0.07	0.68		0.07	0.22			0.07		0.11	0.24	
Control Delay	2.4	7.0		3.0	2.0			0.8		38.0	15.6	
Queue Delay	0.0	1.5		0.0	0.2			0.0		0.0	0.0	
Total Delay	2.4	8.6		3.0	2.2			0.8		38.0	15.6	
LOS	A	A		A	A			A		D	B	
Approach Delay		8.3			2.3			0.8			21.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			A			C	
Queue Length 50th (m)	1.3	72.5		0.5	11.5			0.0		2.6	0.2	
Queue Length 95th (m)	3.7	132.9		2.1	17.4			0.5		8.2	9.7	
Internal Link Dist (m)		122.1			94.3			34.9			32.3	
Turn Bay Length (m)				25.0						20.0		
Base Capacity (vph)	574	1477		221	2773			390		351	418	
Starvation Cap Reductn	0	280		0	1340			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	0.07	0.84		0.07	0.43			0.03		0.04	0.10	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 92			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 70.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Lakeshore Road & Elizabeth Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	923	5	15	557	10	3	0	8	13	1	38
Future Volume (vph)	39	923	5	15	557	10	3	0	8	13	1	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00			0.90		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1489	1690		1010	3170			1179		1321	1160	
Flt Permitted	0.42	1.00		0.24	1.00			0.90		0.75	1.00	
Satd. Flow (perm)	656	1690		252	3170			1079		1042	1160	
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)	42	1003	5	16	605	11	3	0	9	14	1	41
RTOR Reduction (vph)	0	0	0	0	1	0	0	11	0	0	38	0
Lane Group Flow (vph)	42	1008	0	16	615	0	0	1	0	14	4	0
Confl. Peds. (#/hr)	16		21	21		16	7					7
Heavy Vehicles (%)	8%	1%	20%	60%	2%	10%	0%	0%	38%	23%	0%	24%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	75.9	75.9		75.9	75.9			5.0		5.0	5.0	
Effective Green, g (s)	78.9	78.9		78.9	78.9			8.0		8.0	8.0	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.08		0.08	0.08	
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)	545	1405		209	2635			90		87	97	
v/s Ratio Prot		c0.60			0.19						0.00	
v/s Ratio Perm	0.06			0.06				0.00		c0.01		
v/c Ratio	0.08	0.72		0.08	0.23			0.01		0.16	0.05	
Uniform Delay, d1	1.4	3.3		1.4	1.7			39.8		40.3	39.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.3	3.2		0.7	0.2			0.1		0.9	0.2	
Delay (s)	1.7	6.5		2.2	1.9			39.9		41.2	40.1	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		6.3			1.9			39.9			40.4	
Approach LOS		A			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	94.9	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	70.8%	ICU Level of Service		C	
Analysis Period (min)	15				

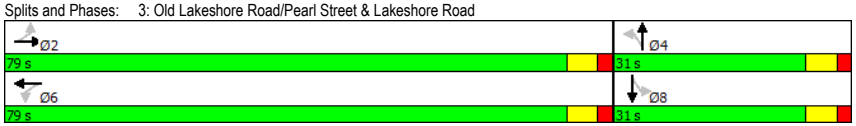
c Critical Lane Group

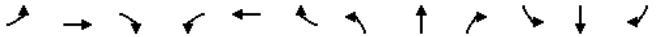
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	882	23	1	536	28	0	1	1	10	1	46
Future Volume (vph)	39	882	23	1	536	28	0	1	1	10	1	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	0.0		0.0	7.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			0.99		1.00		
Frt		0.996			0.993			0.932			0.853	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1624	1654	0	1624	3128	0	0	1574	0	1354	1365	0
Flt Permitted	0.420			0.247						0.757		
Satd. Flow (perm)	708	1654	0	422	3128	0	0	1574	0	1073	1365	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			11			1			50	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		118.3			120.7			53.5			115.4	
Travel Time (s)		8.5			8.7			3.9			8.3	
Confl. Peds. (#/hr)	20					20			2	2		
Confl. Bikes (#/hr)			1									
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%	3%	0%	0%	3%	0%	0%	0%	0%	20%	0%	7%
Adj. Flow (vph)	42	959	25	1	583	30	0	1	1	11	1	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	984	0	1	613	0	0	2	0	11	51	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		28.0	28.0		28.0	28.0	
Total Split (s)	79.0	79.0		79.0	79.0		31.0	31.0		31.0	31.0	
Total Split (%)	71.8%	71.8%		71.8%	71.8%		28.2%	28.2%		28.2%	28.2%	
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	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		Max	Max		None	None		None	None	
Act Effct Green (s)	84.4	84.4		84.4	84.4			10.3		10.3	10.3	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.10		0.10	0.10	
v/c Ratio	0.07	0.70		0.00	0.23			0.01		0.10	0.27	
Control Delay	2.2	7.2		2.0	2.1			32.5		40.6	15.7	
Queue Delay	0.0	4.3		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.2	11.6		2.0	2.1			32.5		40.6	15.7	
LOS	A	B		A	A			C		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		11.2			2.1			32.5			20.1	
Approach LOS		B			A			C			C	
Queue Length 50th (m)	1.2	64.7		0.0	10.5			0.2		2.2	0.2	
Queue Length 95th (m)	3.3	117.6		0.3	15.6			2.3		7.3	11.1	
Internal Link Dist (m)		94.3			96.7			29.5			91.4	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	604	1411		360	2670			432		294	410	
Starvation Cap Reductn	0	344		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	0.07	0.92		0.00	0.23			0.00		0.04	0.12	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 98.9			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			

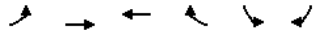
Splits and Phases: 3: Old Lakeshore Road/Pearl Street & Lakeshore Road





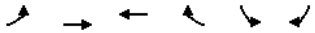
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	882	23	1	536	28	0	1	1	10	1	46
Future Volume (vph)	39	882	23	1	536	28	0	1	1	10	1	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99			0.93		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1602	1654		1624	3128			1575		1348	1365	
Flt Permitted	0.42	1.00		0.25	1.00			1.00		0.76	1.00	
Satd. Flow (perm)	708	1654		423	3128			1575		1073	1365	
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)	42	959	25	1	583	30	0	1	1	11	1	50
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	46	0
Lane Group Flow (vph)	42	984	0	1	611	0	0	1	0	11	5	0
Confl. Peds. (#/hr)	20					20			2	2		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	20%	0%	7%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	81.5	81.5		81.5	81.5			6.6		6.6	6.6	
Effective Green, g (s)	83.5	83.5		83.5	83.5			8.6		8.6	8.6	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.09		0.09	0.09	
Clearance Time (s)	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	
Lane Grp Cap (vph)	590	1379		352	2609			135		92	117	
v/s Ratio Prot		c0.59			0.20			0.00			0.00	
v/s Ratio Perm	0.06			0.00						c0.01		
v/c Ratio	0.07	0.71		0.00	0.23			0.01		0.12	0.05	
Uniform Delay, d1	1.5	3.4		1.4	1.7			41.8		42.3	42.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.8		0.0	0.2			0.0		0.6	0.2	
Delay (s)	1.5	5.2		1.4	1.9			41.9		42.8	42.1	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		5.0			1.9			41.9			42.3	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	100.1	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	67.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	97	796	547	19	12	18
Future Volume (vph)	97	796	547	19	12	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.995		0.918	
Flt Protected	0.950				0.981	
Satd. Flow (prot)	1608	1676	1666	0	1540	0
Flt Permitted	0.950				0.981	
Satd. Flow (perm)	1608	1676	1666	0	1540	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	127.1		115.7	
Travel Time (s)		8.7	9.2		8.3	
Confl. Peds. (#/hr)	13			13		
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	2%	2%	5%	0%	0%
Adj. Flow (vph)	105	865	595	21	13	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	105	865	616	0	33	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	56.5%	ICU Level of Service B	
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	97	796	547	19	12	18
Future Volume (Veh/h)	97	796	547	19	12	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	105	865	595	21	13	20
Pedestrians					13	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (m)		121				
pX, platoon unblocked					0.75	
vC, conflicting volume	629				1694	618
vC1, stage 1 conf vol					618	
vC2, stage 2 conf vol					1075	
vCu, unblocked vol	629				1758	618
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	89				94	96
cM capacity (veh/h)	948				231	487

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	105	865	616	33
Volume Left	105	0	0	13
Volume Right	0	0	21	20
cSH	948	1700	1700	339
Volume to Capacity	0.11	0.51	0.36	0.10
Queue Length 95th (m)	3.0	0.0	0.0	2.6
Control Delay (s)	9.3	0.0	0.0	16.8
Lane LOS	A			C
Approach Delay (s)	1.0		0.0	16.8
Approach LOS				C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	22	8	13	101	23	6
Future Volume (vph)	22	8	13	101	23	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.963				0.970	
Flt Protected	0.965			0.994		
Satd. Flow (prot)	1533	0	0	1655	1608	0
Flt Permitted	0.965			0.994		
Satd. Flow (perm)	1533	0	0	1655	1608	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	121.9			115.7	58.9	
Travel Time (s)	8.8			8.3	4.2	
Confl. Peds. (#/hr)	2	4	7			7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	0%	8%	2%	4%	0%
Adj. Flow (vph)	24	9	14	110	25	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	0	124	32	0
Sign Control	Stop			Free	Free	

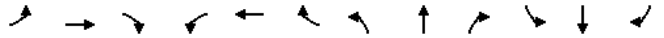
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	8	13	101	23	6
Future Volume (Veh/h)	22	8	13	101	23	6
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)	24	9	14	110	25	7
Pedestrians	7			4	2	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	176	40	39			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	176	40	39			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	97	99	99			
cM capacity (veh/h)	794	1028	1524			

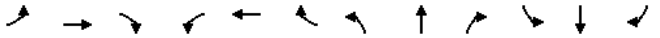
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	33	124	32
Volume Left	24	14	0
Volume Right	9	0	7
cSH	847	1524	1700
Volume to Capacity	0.04	0.01	0.02
Queue Length 95th (m)	1.0	0.2	0.0
Control Delay (s)	9.4	0.9	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	0.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		2.2	
Intersection Capacity Utilization		24.6%	ICU Level of Service A
Analysis Period (min)		15	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	15	9	3	9	8	13	47	6	24	45	22
Future Volume (vph)	9	15	9	3	9	8	13	47	6	24	45	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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												
Frt		0.962			0.945			0.987			0.967	
Flt Protected		0.986			0.993			0.990			0.987	
Satd. Flow (prot)	0	1574	0	0	1524	0	0	1623	0	0	1566	0
Flt Permitted		0.986			0.993			0.990			0.987	
Satd. Flow (perm)	0	1574	0	0	1524	0	0	1623	0	0	1566	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		58.7			121.9			115.4			90.8	
Travel Time (s)		4.2			8.8			8.3			6.5	
Confl. Peds. (#/hr)	11		15	15		11	10		4	4		10
Confl. Bikes (#/hr)									1			
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%	11%	0%	0%	13%	8%	2%	0%	4%	4%	5%
Adj. Flow (vph)	10	16	10	3	10	9	14	51	7	26	49	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	0	0	22	0	0	72	0	0	99	0
Sign Control		Stop			Stop			Stop			Stop	

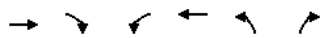
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	24.2%	ICU Level of Service A	
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	15	9	3	9	8	13	47	6	24	45	22
Future Volume (vph)	9	15	9	3	9	8	13	47	6	24	45	22
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)	10	16	10	3	10	9	14	51	7	26	49	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	36	22	72	99
Volume Left (vph)	10	3	14	26
Volume Right (vph)	10	9	7	24
Hadj (s)	-0.06	-0.13	0.03	-0.02
Departure Headway (s)	4.2	4.2	4.2	4.1
Degree Utilization, x	0.04	0.03	0.08	0.11
Capacity (veh/h)	812	821	841	864
Control Delay (s)	7.4	7.3	7.5	7.6
Approach Delay (s)	7.4	7.3	7.5	7.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.5	
Level of Service			A	
Intersection Capacity Utilization			24.2%	ICU Level of Service
Analysis Period (min)			15	A



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	388	29	0	269	0	123
Future Volume (vph)	388	29	0	269	0	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	1810	1429	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1810	1429	0	1863	0	1611
Link Speed (k/h)	50			50	50	
Link Distance (m)	135.1			145.3	147.5	
Travel Time (s)	9.7			10.5	10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	13%	2%	2%	2%	2%
Adj. Flow (vph)	422	32	0	292	0	134
Shared Lane Traffic (%)						
Lane Group Flow (vph)	422	32	0	292	0	134
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	388	29	0	269	0	123
Future Volume (Veh/h)	388	29	0	269	0	123
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	422	32	0	292	0	134
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				145		
pX, platoon unblocked					0.93	
vC, conflicting volume			422		714	422
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			422		651	422
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	79
cM capacity (veh/h)			1137		401	632

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	422	32	292	134
Volume Left	0	0	0	0
Volume Right	0	32	0	134
cSH	1700	1700	1700	632
Volume to Capacity	0.25	0.02	0.17	0.21
Queue Length 95th (m)	0.0	0.0	0.0	6.4
Control Delay (s)	0.0	0.0	0.0	12.2
Lane LOS				B
Approach Delay (s)	0.0		0.0	12.2
Approach LOS				B

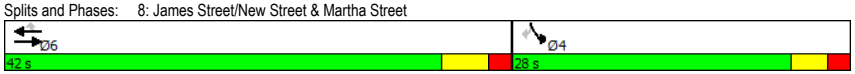
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	511	268	66	9	1
Future Volume (vph)	0	511	268	66	9	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			20.0	25.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		0.97
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1845	1810	1583	1626	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	1845	1810	1548	1626	1566
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				72		1
Link Speed (k/h)		50	50		50	
Link Distance (m)		145.3	340.2		109.6	
Travel Time (s)		10.5	24.5		7.9	
Confl. Peds. (#/hr)				2		6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	2%	11%	0%
Adj. Flow (vph)	0	555	291	72	10	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	555	291	72	10	1
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Detector Phase		6	6	6	4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0	8.0	8.0	8.0
Minimum Split (s)		42.0	42.0	42.0	28.0	28.0
Total Split (s)		42.0	42.0	42.0	28.0	28.0
Total Split (%)		60.0%	60.0%	60.0%	40.0%	40.0%
Yellow Time (s)		4.0	4.0	4.0	3.0	3.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-1.0	-1.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		Max	Max	Max	Max	Max
Act Effct Green (s)		38.0	38.0	38.0	24.0	24.0
Actuated g/C Ratio		0.54	0.54	0.54	0.34	0.34
v/c Ratio		0.55	0.30	0.08	0.02	0.00
Control Delay		13.1	9.8	2.5	15.4	12.0
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		13.1	9.8	2.5	15.4	12.0
LOS		B	A	A	B	B
Approach Delay		13.1	8.3		15.1	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach LOS		B	A		B	
Queue Length 50th (m)		46.0	20.1	0.0	0.9	0.0
Queue Length 95th (m)		73.1	33.9	5.1	3.8	1.0
Internal Link Dist (m)		121.3	316.2		85.6	
Turn Bay Length (m)				20.0	25.0	
Base Capacity (vph)		1001	982	873	557	537
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.55	0.30	0.08	0.02	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 11.3		Intersection LOS: B	
Intersection Capacity Utilization 50.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: James Street/New Street & Martha Street



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	511	268	66	9	1
Future Volume (vph)	0	511	268	66	9	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1845	1810	1548	1626	1566
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1845	1810	1548	1626	1566
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	555	291	72	10	1
RTOR Reduction (vph)	0	0	0	33	0	1
Lane Group Flow (vph)	0	555	291	39	10	0
Confl. Peds. (#/hr)				2		6
Heavy Vehicles (%)	0%	3%	5%	2%	11%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Actuated Green, G (s)		36.0	36.0	36.0	23.0	23.0
Effective Green, g (s)		38.0	38.0	38.0	24.0	24.0
Actuated g/C Ratio		0.54	0.54	0.54	0.34	0.34
Clearance Time (s)		6.0	6.0	6.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1001	982	840	557	536
v/s Ratio Prot		c0.30	0.16		c0.01	
v/s Ratio Perm				0.03		0.00
v/c Ratio		0.55	0.30	0.05	0.02	0.00
Uniform Delay, d1		10.5	8.7	7.5	15.2	15.1
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.2	0.8	0.1	0.1	0.0
Delay (s)		12.7	9.5	7.6	15.3	15.1
Level of Service		B	A	A	B	B
Approach Delay (s)		12.7	9.1		15.3	
Approach LOS		B	A		B	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	123	0	0	29
Future Volume (vph)	0	0	123	0	0	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	1863	0	0	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	1863	0	0	1863
Link Speed (k/h)	50		50			50
Link Distance (m)	210.4		58.9			147.5
Travel Time (s)	15.1		4.2			10.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	134	0	0	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	134	0	0	32
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 9.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	123	0	0	29
Future Volume (Veh/h)	0	0	123	0	0	29
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	134	0	0	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	166	134			134	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	166	134			134	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	824	915			1451	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	134	32
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1451
Volume to Capacity	0.00	0.08	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

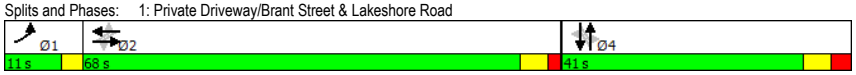
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	9.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	654	14	3	1045	94	5	7	0	99	9	275
Future Volume (vph)	156	654	14	3	1045	94	5	7	0	99	9	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	25.0		0.0	0.0		0.0	0.0		15.0
Storage Lanes	1		0	1		0	0		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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			0.99		0.99	0.95	
Frt		0.997			0.988						0.855	
Flt Protected	0.950			0.950				0.981		0.950		
Satd. Flow (prot)	1608	1652	0	1624	3097	0	0	1678	0	1518	1366	0
Flt Permitted	0.160			0.253				0.722		0.749		
Satd. Flow (perm)	271	1652	0	433	3097	0	0	1226	0	1187	1366	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			12						173	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			146.1			72.5			121.7	
Travel Time (s)		11.4			10.5			5.2			8.8	
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
Confl. Bikes (#/hr)			8			10			3			3
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 (%)	1%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Adj. Flow (vph)	170	711	15	3	1136	102	5	8	0	108	10	299
Shared Lane Traffic (%)												
Lane Group Flow (vph)	170	726	0	3	1238	0	0	13	0	108	309	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Detector Phase	1	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.0	33.0		33.0	33.0		38.0	38.0		38.0	38.0	
Total Split (s)	11.0	68.0		68.0	68.0		41.0	41.0		41.0	41.0	
Total Split (%)	9.2%	56.7%		56.7%	56.7%		34.2%	34.2%		34.2%	34.2%	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	73.2	64.3		64.3	64.3			20.3		20.3	20.3	
Actuated g/C Ratio	0.71	0.62		0.62	0.62			0.20		0.20	0.20	
v/c Ratio	0.58	0.71		0.01	0.64			0.05		0.47	0.76	
Control Delay	14.1	20.0		10.7	15.5			32.3		42.7	29.1	
Queue Delay	0.0	0.0		0.0	1.7			0.0		0.0	0.0	
Total Delay	14.1	20.0		10.7	17.3			32.3		42.7	29.1	
LOS	B	B		B	B			C		D	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		18.9			17.2			32.3			32.6	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	8.8	94.2		0.2	78.3			2.3		20.4	27.1	
Queue Length 95th (m)	23.6	190.6		1.8	136.9			7.3		37.0	58.7	
Internal Link Dist (m)		134.0			122.1			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	295	1026		268	1927			440		426	601	
Starvation Cap Reductn	0	0		0	486			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	0.58	0.71		0.01	0.86			0.03		0.25	0.51	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 103.6			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 20.4		Intersection LOS: C	
Intersection Capacity Utilization 80.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Private Driveway/Brant Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	654	14	3	1045	94	5	7	0	99	9	275
Future Volume (vph)	156	654	14	3	1045	94	5	7	0	99	9	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		0.98	1.00			0.99		0.99	1.00	
Frt	1.00	1.00		1.00	0.99			1.00		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1607	1652		1592	3098			1667		1508	1371	
Flt Permitted	0.16	1.00		0.25	1.00			0.72		0.75	1.00	
Satd. Flow (perm)	270	1652		425	3098			1226		1189	1371	
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)	170	711	15	3	1136	102	5	8	0	108	10	299
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	139	0
Lane Group Flow (vph)	170	726	0	3	1233	0	0	13	0	108	170	0
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
Confl. Bikes (#/hr)			8			10			3			3
Heavy Vehicles (%)	1%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Actuated Green, G (s)	70.3	62.4		62.4	62.4			17.3		17.3	17.3	
Effective Green, g (s)	70.3	64.4		64.4	64.4			20.3		20.3	20.3	
Actuated g/C Ratio	0.68	0.62		0.62	0.62			0.20		0.20	0.20	
Clearance Time (s)	3.0	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)	285	1026		264	1925			240		232	268	
v/s Ratio Prot	c0.05	c0.44			0.40						c0.12	
v/s Ratio Perm	0.36			0.01				0.01		0.09		
v/c Ratio	0.60	0.71		0.01	0.64			0.05		0.47	0.63	
Uniform Delay, d1	8.9	13.2		7.5	12.3			33.8		36.9	38.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	3.3	4.1		0.1	1.7			0.1		1.5	4.8	
Delay (s)	12.2	17.3		7.5	14.0			33.9		38.3	43.1	
Level of Service	B	B		A	B			C		D	D	
Approach Delay (s)		16.4			14.0			33.9			41.8	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	103.6	Sum of lost time (s)	11.0
Intersection Capacity Utilization	80.4%	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)	41	638	2	2	976	26	6	0	1	39	0	74
Future Volume (vph)	41	638	2	2	976	26	6	0	1	39	0	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	25.0		0.0	0.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		0.99	1.00			0.99		0.99	0.98	
Frt					0.996			0.983			0.850	
Flt Protected	0.950			0.950				0.958		0.950		
Satd. Flow (prot)	1450	1693	0	1083	3169	0	0	1245	0	1504	1291	0
Flt Permitted	0.247			0.363				0.748		0.752		
Satd. Flow (perm)	377	1693	0	410	3169	0	0	964	0	1183	1291	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5			36			131	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		146.1			118.3			58.9			56.3	
Travel Time (s)		10.5			8.5			4.2			4.1	
Confl. Peds. (#/hr)	4		18	18		4	8		3	3		8
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 (%)	12%	1%	0%	50%	2%	4%	33%	0%	0%	8%	0%	10%
Adj. Flow (vph)	45	693	2	2	1061	28	7	0	1	42	0	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	695	0	2	1089	0	0	8	0	42	80	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		33.0	33.0		33.0	33.0	
Total Split (s)	84.0	84.0		84.0	84.0		36.0	36.0		36.0	36.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	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	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	84.8	84.8		84.8	84.8			12.7		12.7	12.7	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.12		0.12	0.12	
v/c Ratio	0.14	0.49		0.01	0.41			0.05		0.29	0.29	
Control Delay	3.9	4.8		2.5	3.5			0.7		45.3	4.2	
Queue Delay	0.0	1.0		0.0	0.7			0.0		0.0	0.0	
Total Delay	3.9	5.9		2.5	4.1			0.7		45.3	4.2	
LOS	A	A		A	A			A		D	A	
Approach Delay		5.7			4.1			0.7			18.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			A			B	
Queue Length 50th (m)	1.6	36.5		0.1	26.8			0.0		8.0	0.0	
Queue Length 95th (m)	5.4	69.3		0.6	44.2			0.0		18.8	3.5	
Internal Link Dist (m)		122.1			94.3			34.9			32.3	
Turn Bay Length (m)				25.0						20.0		
Base Capacity (vph)	314	1413		342	2646			328		372	496	
Starvation Cap Reductn	0	444		0	1086			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	0.14	0.72		0.01	0.70			0.02		0.11	0.16	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 101.6			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 5.6		Intersection LOS: A	
Intersection Capacity Utilization 54.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Lakeshore Road & Elizabeth Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	638	2	2	976	26	6	0	1	39	0	74
Future Volume (vph)	41	638	2	2	976	26	6	0	1	39	0	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99		0.99	1.00	
Frt	1.00	1.00		1.00	1.00			0.98		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1449	1692		1073	3169			1237		1495	1293	
Flt Permitted	0.25	1.00		0.36	1.00			0.75		0.75	1.00	
Satd. Flow (perm)	377	1692		410	3169			965		1184	1293	
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)	45	693	2	2	1061	28	7	0	1	42	0	80
RTOR Reduction (vph)	0	0	0	0	1	0	0	7	0	0	71	0
Lane Group Flow (vph)	45	695	0	2	1088	0	0	1	0	42	9	0
Confl. Peds. (#/hr)	4		18	18		4	8		3	3		8
Heavy Vehicles (%)	12%	1%	0%	50%	2%	4%	33%	0%	0%	8%	0%	10%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	81.0	81.0		81.0	81.0			8.0		8.0	8.0	
Effective Green, g (s)	84.0	84.0		84.0	84.0			11.0		11.0	11.0	
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.11		0.11	0.11	
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)	307	1379		334	2584			103		126	138	
v/s Ratio Prot		c0.41			0.34						0.01	
v/s Ratio Perm	0.12			0.00				0.00		c0.04		
v/c Ratio	0.15	0.50		0.01	0.42			0.01		0.33	0.06	
Uniform Delay, d1	2.0	3.0		1.8	2.7			41.1		42.6	41.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	1.0	1.3		0.0	0.5			0.0		1.6	0.2	
Delay (s)	3.0	4.3		1.8	3.2			41.2		44.2	41.6	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		4.2			3.2			41.2			42.5	
Approach LOS		A			A			D			D	

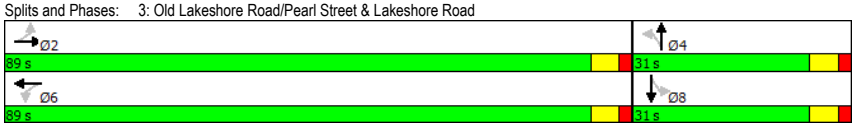
Intersection Summary					
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.48				
Actuated Cycle Length (s)	103.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	54.7%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	631	9	5	934	43	18	9	1	18	4	52
Future Volume (vph)	38	631	9	5	934	43	18	9	1	18	4	52
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	0.0		0.0	7.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			1.00		0.99	0.99	
Frt		0.998			0.993			0.996			0.860	
Flt Protected	0.950			0.950				0.969		0.950		
Satd. Flow (prot)	1624	1673	0	1624	3155	0	0	1649	0	1464	1450	0
Flt Permitted	0.259			0.371				0.768		0.864		
Satd. Flow (perm)	440	1673	0	633	3155	0	0	1304	0	1324	1450	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			9			1			57	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		118.3			120.7			53.5			115.4	
Travel Time (s)		8.5			8.7			3.9			8.3	
Confl. Peds. (#/hr)	20		3	3		20	2		2	2		2
Confl. Bikes (#/hr)						1						
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%	2%	0%	0%	2%	2%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	41	686	10	5	1015	47	20	10	1	20	4	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	696	0	5	1062	0	0	31	0	20	61	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		28.0	28.0		28.0	28.0	
Total Split (s)	89.0	89.0		89.0	89.0		31.0	31.0		31.0	31.0	
Total Split (%)	74.2%	74.2%		74.2%	74.2%		25.8%	25.8%		25.8%	25.8%	
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	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		Max	Max		None	None		None	None	
Act Effct Green (s)	91.6	91.6		91.6	91.6			10.7		10.7	10.7	
Actuated g/C Ratio	0.86	0.86		0.86	0.86			0.10		0.10	0.10	
v/c Ratio	0.11	0.48		0.01	0.39			0.24		0.15	0.31	
Control Delay	2.7	3.9		2.0	2.6			47.0		45.6	17.4	
Queue Delay	0.0	1.7		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.7	5.5		2.0	2.6			47.0		45.6	17.4	
LOS	A	A		A	A			D		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		5.4			2.6			47.0			24.4	
Approach LOS		A			A			D			C	
Queue Length 50th (m)	1.2	31.9		0.2	22.2			5.9		3.9	0.8	
Queue Length 95th (m)	3.8	55.9		0.8	34.0			15.6		11.5	13.2	
Internal Link Dist (m)		94.3			96.7			29.5			91.4	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	378	1438		544	2713			331		336	410	
Starvation Cap Reductn	0	538		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	0.11	0.77		0.01	0.39			0.09		0.06	0.15	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 106.6			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 5.3		Intersection LOS: A	
Intersection Capacity Utilization 53.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Old Lakeshore Road/Pearl Street & Lakeshore Road

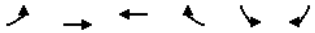


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	631	9	5	934	43	18	9	1	18	4	52
Future Volume (vph)	38	631	9	5	934	43	18	9	1	18	4	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1612	1673		1622	3157			1645		1457	1450	
Flt Permitted	0.26	1.00		0.37	1.00			0.77		0.86	1.00	
Satd. Flow (perm)	439	1673		633	3157			1304		1324	1450	
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)	41	686	10	5	1015	47	20	10	1	20	4	57
RTOR Reduction (vph)	0	0	0	0	1	0	0	1	0	0	52	0
Lane Group Flow (vph)	41	696	0	5	1061	0	0	30	0	20	9	0
Confl. Peds. (#/hr)	20		3	3		20	2		2	2		2
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	0%	0%	11%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	88.8	88.8		88.8	88.8			7.0		7.0	7.0	
Effective Green, g (s)	90.8	90.8		90.8	90.8			9.0		9.0	9.0	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.08		0.08	0.08	
Clearance Time (s)	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	
Lane Grp Cap (vph)	369	1409		533	2659			108		110	121	
v/s Ratio Prot		c0.42			0.34						0.01	
v/s Ratio Perm	0.09			0.01				c0.02		0.02		
v/c Ratio	0.11	0.49		0.01	0.40			0.28		0.18	0.07	
Uniform Delay, d1	1.5	2.3		1.4	2.0			46.4		46.0	45.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.0	0.4			1.4		0.8	0.3	
Delay (s)	1.6	2.6		1.4	2.5			47.8		46.8	45.8	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		2.5			2.5			47.8			46.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	107.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	45	605	967	24	9	15
Future Volume (vph)	45	605	967	24	9	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.997		0.917	
Flt Protected	0.950				0.981	
Satd. Flow (prot)	1624	1693	1685	0	1475	0
Flt Permitted	0.950				0.981	
Satd. Flow (perm)	1624	1693	1685	0	1475	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	127.1		115.7	
Travel Time (s)		8.7	9.2		8.3	
Confl. Peds. (#/hr)	12			12		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	1%	8%	0%	7%
Adj. Flow (vph)	49	658	1051	26	10	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	658	1077	0	26	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	605	967	24	9	15
Future Volume (Veh/h)	45	605	967	24	9	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	658	1051	26	10	16
Pedestrians		1			12	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.2			1.2	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (m)		121				
pX, platoon unblocked					0.89	
vC, conflicting volume	1089				1832	1077
vC1, stage 1 conf vol					1076	
vC2, stage 2 conf vol					756	
vCu, unblocked vol	1089				1872	1077
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.4
p0 queue free %	92				96	94
cM capacity (veh/h)	642				259	257

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	49	658	1077	26
Volume Left	49	0	0	10
Volume Right	0	0	26	16
cSH	642	1700	1700	258
Volume to Capacity	0.08	0.39	0.63	0.10
Queue Length 95th (m)	2.0	0.0	0.0	2.7
Control Delay (s)	11.1	0.0	0.0	20.5
Lane LOS	B			C
Approach Delay (s)	0.8		0.0	20.5
Approach LOS				C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	29	16	18	88	13	4
Future Volume (vph)	29	16	18	88	13	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.953				0.970	
Flt Protected	0.968			0.991		
Satd. Flow (prot)	1577	0	0	1695	1659	0
Flt Permitted	0.968			0.991		
Satd. Flow (perm)	1577	0	0	1695	1659	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	121.9			115.7	59.2	
Travel Time (s)	8.8			8.3	4.3	
Confl. Peds. (#/hr)		1	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	17	20	96	14	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	0	0	116	18	0
Sign Control	Stop			Free	Free	

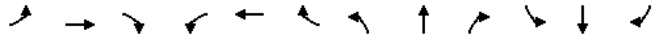
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	16	18	88	13	4
Future Volume (Veh/h)	29	16	18	88	13	4
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)	32	17	20	96	14	4
Pedestrians	5			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	157	22	23			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	157	22	23			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	98	99			
cM capacity (veh/h)	825	1056	1599			

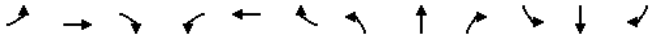
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	49	116	18
Volume Left	32	20	0
Volume Right	17	0	4
cSH	893	1599	1700
Volume to Capacity	0.05	0.01	0.01
Queue Length 95th (m)	1.4	0.3	0.0
Control Delay (s)	9.3	1.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	1.3	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		3.3		
Intersection Capacity Utilization		23.2%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	14	11	5	17	14	28	47	5	28	79	33
Future Volume (vph)	17	14	11	5	17	14	28	47	5	28	79	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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												
Frt		0.964			0.947			0.992			0.968	
Flt Protected		0.980			0.993			0.983			0.990	
Satd. Flow (prot)	0	1615	0	0	1608	0	0	1667	0	0	1639	0
Flt Permitted		0.980			0.993			0.983			0.990	
Satd. Flow (perm)	0	1615	0	0	1608	0	0	1667	0	0	1639	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		58.7			121.9			115.4			90.8	
Travel Time (s)		4.2			8.8			8.3			6.5	
Confl. Peds. (#/hr)	13		18	18		13	10		4	4		10
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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	18	15	12	5	18	15	30	51	5	30	86	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	45	0	0	38	0	0	86	0	0	152	0
Sign Control		Stop			Stop			Stop			Stop	

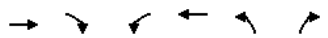
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	14	11	5	17	14	28	47	5	28	79	33
Future Volume (vph)	17	14	11	5	17	14	28	47	5	28	79	33
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)	18	15	12	5	18	15	30	51	5	30	86	36

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	45	38	86	152
Volume Left (vph)	18	5	30	30
Volume Right (vph)	12	15	5	36
Hadj (s)	-0.08	-0.21	0.03	-0.10
Departure Headway (s)	4.4	4.3	4.3	4.1
Degree Utilization, x	0.05	0.04	0.10	0.17
Capacity (veh/h)	775	786	813	861
Control Delay (s)	7.6	7.5	7.8	7.9
Approach Delay (s)	7.6	7.5	7.8	7.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.8	
Level of Service			A	
Intersection Capacity Utilization			27.1%	ICU Level of Service
Analysis Period (min)			15	



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	329	17	0	750	0	117
Future Volume (vph)	329	17	0	750	0	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	1863	1538	0	1900	0	1644
Flt Permitted						
Satd. Flow (perm)	1863	1538	0	1900	0	1644
Link Speed (k/h)	50			50	50	
Link Distance (m)	110.3			205.0	191.5	
Travel Time (s)	7.9			14.8	13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	5%	0%	0%	0%	0%
Adj. Flow (vph)	358	18	0	815	0	127
Shared Lane Traffic (%)						
Lane Group Flow (vph)	358	18	0	815	0	127
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	329	17	0	750	0	117
Future Volume (Veh/h)	329	17	0	750	0	117
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	358	18	0	815	0	127
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				205		
pX, platoon unblocked					0.87	
vC, conflicting volume			358		1173	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			358		1124	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	82
cM capacity (veh/h)			1212		199	691

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	358	18	815	127
Volume Left	0	0	0	0
Volume Right	0	18	0	127
cSH	1700	1700	1700	691
Volume to Capacity	0.21	0.01	0.48	0.18
Queue Length 95th (m)	0.0	0.0	0.0	5.4
Control Delay (s)	0.0	0.0	0.0	11.4
Lane LOS				B
Approach Delay (s)	0.0		0.0	11.4
Approach LOS				B

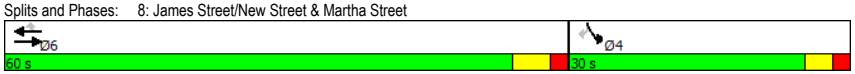
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	446	749	92	7	1
Future Volume (vph)	0	446	749	92	7	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			20.0	25.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1881	1599	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1881	1563	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				46		1
Link Speed (k/h)		50	50		50	
Link Distance (m)		205.0	135.0		164.4	
Travel Time (s)		14.8	9.7		11.8	
Confl. Peds. (#/hr)				2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	1%	1%	0%	0%
Adj. Flow (vph)	0	485	814	100	8	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	485	814	100	8	1
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Detector Phase		6	6	6	4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0	8.0	8.0	8.0
Minimum Split (s)		42.0	42.0	42.0	28.0	28.0
Total Split (s)		60.0	60.0	60.0	30.0	30.0
Total Split (%)		66.7%	66.7%	66.7%	33.3%	33.3%
Yellow Time (s)		4.0	4.0	4.0	3.0	3.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-1.0	-1.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		Max	Max	Max	None	None
Act Effct Green (s)		74.6	74.6	74.6	9.0	9.0
Actuated g/C Ratio		0.96	0.96	0.96	0.12	0.12
v/c Ratio		0.27	0.45	0.07	0.04	0.01
Control Delay		1.1	1.8	0.6	33.3	27.0
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		1.1	1.8	0.6	33.3	27.0
LOS		A	A	A	C	C
Approach Delay		1.1	1.6		32.6	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach LOS		A	A		C	
Queue Length 50th (m)		0.0	0.0	0.0	1.1	0.0
Queue Length 95th (m)		24.3	53.0	3.8	5.6	1.7
Internal Link Dist (m)		181.0	111.0		140.4	
Turn Bay Length (m)				20.0	25.0	
Base Capacity (vph)		1791	1808	1504	607	543
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.27	0.45	0.07	0.01	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 77.6			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 1.6		Intersection LOS: A	
Intersection Capacity Utilization 52.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: James Street/New Street & Martha Street



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	446	749	92	7	1
Future Volume (vph)	0	446	749	92	7	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1863	1881	1563	1805	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1863	1881	1563	1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	485	814	100	8	1
RTOR Reduction (vph)	0	0	0	6	0	1
Lane Group Flow (vph)	0	485	814	94	8	0
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	2%	1%	1%	0%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Actuated Green, G (s)		69.3	69.3	69.3	1.4	1.4
Effective Green, g (s)		71.3	71.3	71.3	2.4	2.4
Actuated g/C Ratio		0.87	0.87	0.87	0.03	0.03
Clearance Time (s)		6.0	6.0	6.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1625	1641	1364	53	47
v/s Ratio Prot		0.26	c0.43		c0.00	
v/s Ratio Perm				0.06		0.00
v/c Ratio		0.30	0.50	0.07	0.15	0.00
Uniform Delay, d1		0.9	1.2	0.7	38.7	38.5
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	1.1	0.1	1.3	0.0
Delay (s)		1.4	2.2	0.8	40.0	38.5
Level of Service		A	A	A	D	D
Approach Delay (s)		1.4	2.1		39.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	2.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	81.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	117	0	0	17
Future Volume (vph)	0	0	117	0	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	1863	0	0	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	1863	0	0	1863
Link Speed (k/h)	50		50			50
Link Distance (m)	205.3		59.2			191.5
Travel Time (s)	14.8		4.3			13.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	127	0	0	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	127	0	0	18
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 9.5%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	117	0	0	17
Future Volume (Veh/h)	0	0	117	0	0	17
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	127	0	0	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	145	127			127	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	145	127			127	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	847	923			1459	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	127	18
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1459
Volume to Capacity	0.00	0.07	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		9.5%	ICU Level of Service A
Analysis Period (min)		15	

Appendix D

Trip Distribution Calculations

INBOUND

Thu Jun 21 2018 17:08:42 GMT-0400 (Eastern Daylight Time) - Run Time: 2228ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of origin - pd_orig
Column: Primary travel mode of trip - mode_prime
Table: Ward number of destination - ward_dest

Filters:
Ward number of destination - ward_dest In 166
and
Primary travel mode of trip - mode_prime In D
and
Start time of trip - start_time In 1600 - 1800

Trip 2016
Table: 166

	Auto driver		
PD 1 of Toronto	77		
PD 7 of Toronto	22		
PD 8 of Toronto	10		
PD 9 of Toronto	39		
King	10		
Brampton	30		
Mississauga	377	565	5.78%
Halton Hills	14		
Milton	197		
Oakville	899	1110	11.36%
Burlington	6377	6377	65.27%
Flamborough	152		
Dundas	52		
Ancaster	86		
Glanbrook	74		
Stoney Creek	112		
Hamilton	854	1330	13.61%
Grimsby	37		
Lincoln	33		
St. Catharines	37		
Fort Erie	42	149	1.53%
Waterloo	10		
Kitchener	36		
Cambridge	41		
City of Guelph	9		
New Tecumseth	18		
Oxford	35		
Brant	11		
Brantford	79	239	2.45%
	9770		

OUTBOUND

Thu Jun 21 2018 17:05:14 GMT-0400 (Eastern Daylight Time) - Run Time: 2425ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest
Column: Primary travel mode of trip - mode_prime
Table: Ward number of origin - ward_orig

Filters:
Ward number of origin - ward_orig In 166
and
Primary travel mode of trip - mode_prime In D
and
Start time of trip - start_time In 700 - 900

Trip 2016
Table: 166

	Auto driver		
PD 1 of Toronto	54		
PD 3 of Toronto	16		
PD 8 of Toronto	19		
PD 9 of Toronto	11		
PD 11 of Toronto	19		
King	10		
Caledon	18		
Brampton	130		
Mississauga	304	581	7.91%
Milton	101		
Oakville	973	1074	14.62%
Burlington	4333	4333	58.98%
Flamborough	136		
Dundas	38		
Ancaster	22		
Stoney Creek	89		
Hamilton	786	1071	14.58%
Niagara-on-the-Lake	16		
St. Catharines	18		
Niagara Falls	58		
Fort Erie	42	134	1.82%
Kitchener	65		
Cambridge	41		
City of Guelph	48	154	2.10%
	7347		

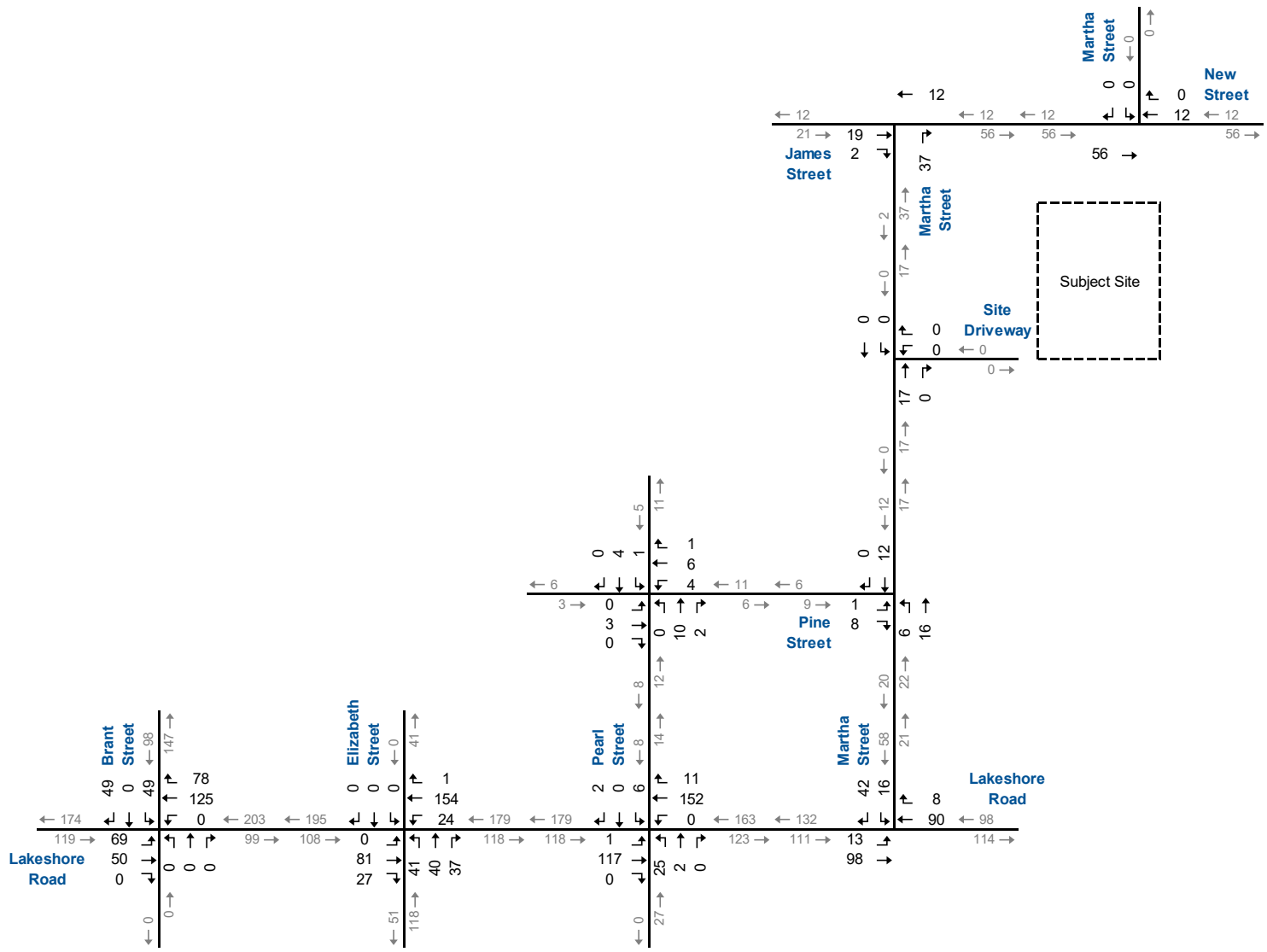
Regional						
	INBOUND	OUTBOUND	AVERAGE	ROUNDED	Route	
GTA	5.78%	7.91%	6.85%	7%	West Lakeshore Road	7%
	11.36%	14.62%	12.99%	13%	West Lakeshore Road	10%
Halton					East Lakeshore Road	3%
Burlington	65.27%	58.98%	62.12%	62%	North Brant Street	22%
					East New Street	15%
					East Lakeshore Road	19%
					West Lakeshore Road	6%
Hamilton Area	13.61%	14.58%	14.10%	14%	West Lakeshore Road	14%
Niagara	1.53%	1.82%	1.67%	2%	West Lakeshore Road	2%
Southwestern Ontario	2.45%	2.10%	2.27%	2%	West Lakeshore Road	2%
	100.00%	100.00%	100.00%	100%		100%

Burlington Local											
		AM				PM				AVG	Adjusted for Burlington
North	Brant Street	239	210	449	9%	374	238	612	13%	11%	15%
East	New Street	352	374	726	15%	892	411	1303	27%	21%	25%
West	James Street	300	328	628	13%	798	342	1140	24%	18%	20%
East	Lakeshore Road	763	605	1368	28%	833	696	1529	32%	30%	30%
West	Lakeshore Road	902	744	1646	34%	988	1103	2091	43%	39%	10%
				4817				6675			100%

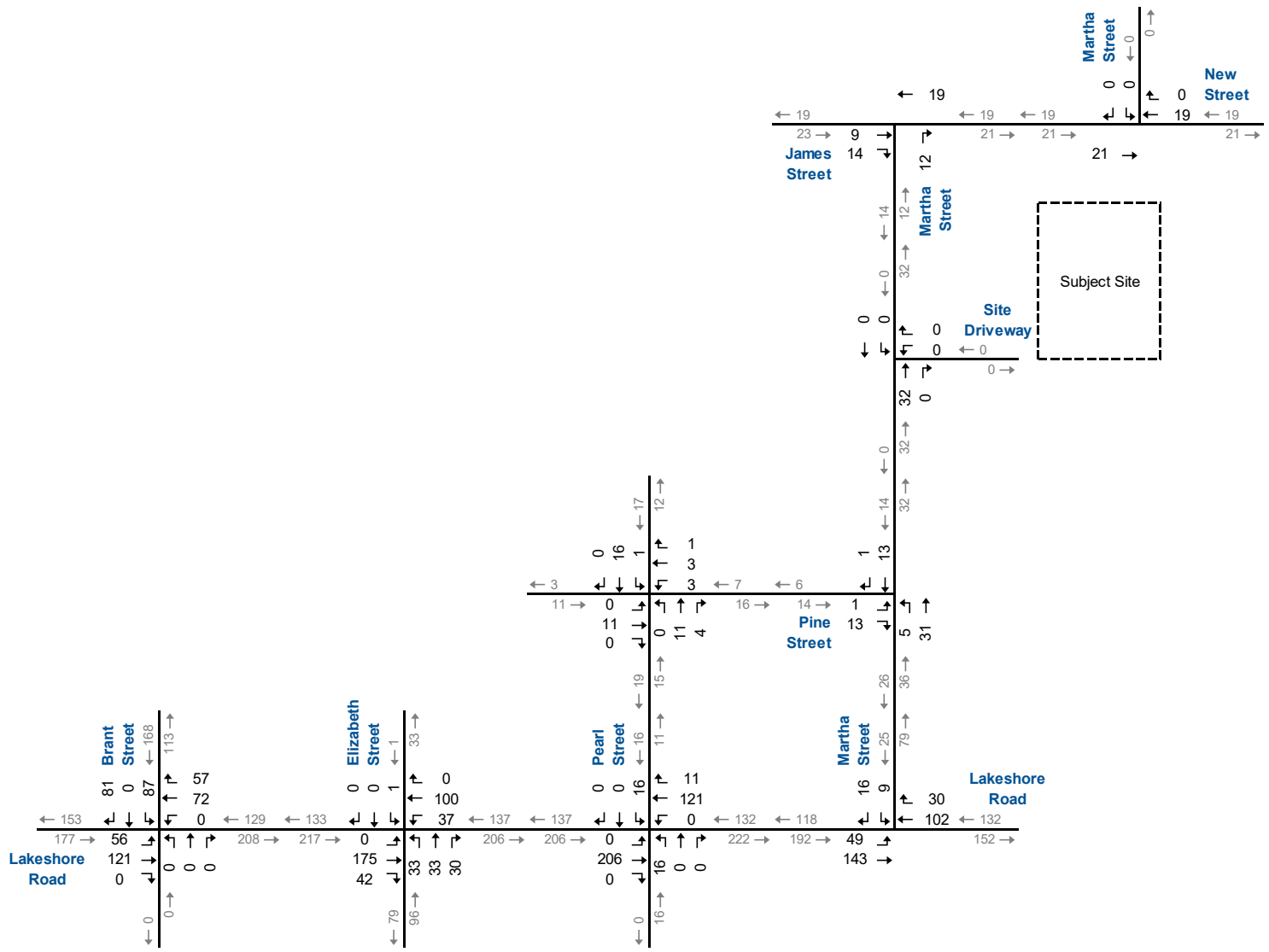
Appendix E

In-Stream Development Traffic Forecasts





In-Stream Development Traffic Forecasts
AM Peak Hour



In-Stream Development Traffic Forecasts
AM Peak Hour

Appendix F

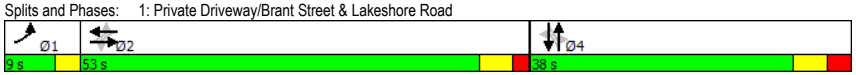
2027 Background Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	1051	8	1	750	170	5	3	1	138	1	201
Future Volume (vph)	230	1051	8	1	750	170	5	3	1	138	1	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	25.0		0.0	0.0		0.0	0.0		15.0
Storage Lanes	1		0	1		0	0		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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			0.99			1.00		0.99	0.99	
Frt		0.999			0.972			0.985			0.851	
Flt Protected	0.950			0.950				0.973		0.950		
Satd. Flow (prot)	1547	1643	0	812	2984	0	0	1402	0	1608	1381	0
Flt Permitted	0.223			0.081				0.840		0.752		
Satd. Flow (perm)	362	1643	0	69	2984	0	0	1210	0	1266	1381	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			38			1			218	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			146.1			72.5			121.7	
Travel Time (s)		11.4			10.5			5.2			8.8	
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
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 (%)	5%	4%	0%	100%	5%	5%	0%	50%	0%	1%	0%	4%
Adj. Flow (vph)	250	1142	9	1	815	185	5	3	1	150	1	218
Shared Lane Traffic (%)												
Lane Group Flow (vph)	250	1151	0	1	1000	0	0	9	0	150	219	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Detector Phase	1	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.0	33.0		33.0	33.0		38.0	38.0		38.0	38.0	
Total Split (s)	9.0	53.0		53.0	53.0		38.0	38.0		38.0	38.0	
Total Split (%)	9.0%	53.0%		53.0%	53.0%		38.0%	38.0%		38.0%	38.0%	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	56.1	49.1		49.1	49.1			18.1		18.1	18.1	
Actuated g/C Ratio	0.67	0.58		0.58	0.58			0.21		0.21	0.21	
v/c Ratio	0.77	1.20		0.03	0.57			0.03		0.55	0.47	
Control Delay	25.7	122.2		11.0	12.9			24.0		37.3	7.5	
Queue Delay	0.0	0.0		0.0	0.4			0.0		0.0	0.0	
Total Delay	25.7	122.2		11.0	13.2			24.0		37.3	7.5	
LOS	C	F		B	B			C		D	A	
Approach Delay		105.0			13.2			24.0			19.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			B			C			B	
Queue Length 50th (m)	12.7	~241.1		0.1	48.8			1.1		22.7	0.1	
Queue Length 95th (m)	#44.8	#358.5		1.0	81.7			4.8		41.1	17.1	
Internal Link Dist (m)		134.0			122.1			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	325	957		40	1754			489		511	688	
Starvation Cap Reductn	0	0		0	282			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	0.77	1.20		0.03	0.68			0.02		0.29	0.32	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 84.3			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 60.4		Intersection LOS: E	
Intersection Capacity Utilization 93.1%		ICU Level of Service F	
Analysis Period (min) 15			
~ 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.			

Splits and Phases: 1: Private Driveway/Brant Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	1051	8	1	750	170	5	3	1	138	1	201
Future Volume (vph)	230	1051	8	1	750	170	5	3	1	138	1	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97			0.98		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1546	1642		812	2987			1402		1601	1381	
Flt Permitted	0.22	1.00		0.08	1.00			0.84		0.75	1.00	
Satd. Flow (perm)	362	1642		70	2987			1210		1267	1381	
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)	250	1142	9	1	815	185	5	3	1	150	1	218
RTOR Reduction (vph)	0	0	0	0	16	0	0	1	0	0	171	0
Lane Group Flow (vph)	250	1151	0	1	984	0	0	8	0	150	48	0
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
Heavy Vehicles (%)	5%	4%	0%	100%	5%	5%	0%	50%	0%	1%	0%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Actuated Green, G (s)	53.1	47.1		47.1	47.1			15.1		15.1	15.1	
Effective Green, g (s)	53.1	49.1		49.1	49.1			18.1		18.1	18.1	
Actuated g/C Ratio	0.63	0.58		0.58	0.58			0.21		0.21	0.21	
Clearance Time (s)	3.0	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)	312	957		40	1741			260		272	296	
v/s Ratio Prot	c0.06	c0.70			0.33						0.03	
v/s Ratio Perm	0.45			0.01				0.01		c0.12		
v/c Ratio	0.80	1.20		0.03	0.57			0.03		0.55	0.16	
Uniform Delay, d1	8.3	17.6		7.4	10.9			26.1		29.4	26.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	13.7	101.1		1.2	1.3			0.0		2.4	0.3	
Delay (s)	22.0	118.6		8.6	12.2			26.2		31.8	27.1	
Level of Service	C	F		A	B			C		C	C	
Approach Delay (s)		101.4			12.2			26.2			29.1	
Approach LOS		F			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	59.4	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	84.2	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	93.1%	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)	42	1071	32	40	751	12	44	40	46	14	1	41
Future Volume (vph)	42	1071	32	40	751	12	44	40	46	14	1	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	25.0		0.0	0.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			1.00			0.98	
Frt		0.996			0.998			0.952			0.853	
Flt Protected	0.950			0.950				0.983		0.950		
Satd. Flow (prot)	1504	1674	0	1015	3173	0	0	1410	0	1321	1157	0
Flt Permitted	0.321			0.094				0.877		0.565		
Satd. Flow (perm)	504	1674	0	100	3173	0	0	1255	0	785	1157	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			3			24			45	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		146.1			118.3			58.9			56.3	
Travel Time (s)		10.5			8.5			4.2			4.1	
Confl. Peds. (#/hr)	16		21	21		16	7					7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	1%	20%	60%	2%	10%	0%	0%	38%	23%	0%	24%
Adj. Flow (vph)	46	1164	35	43	816	13	48	43	50	15	1	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	1199	0	43	829	0	0	141	0	15	46	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		33.0	33.0		33.0	33.0	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	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	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	76.0	76.0		76.0	76.0			17.7		17.7	17.7	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.17		0.17	0.17	
v/c Ratio	0.12	0.96		0.58	0.35			0.59		0.11	0.19	
Control Delay	5.6	31.7		45.2	5.4			41.4		34.9	12.2	
Queue Delay	0.0	41.9		0.0	0.6			0.0		0.0	0.0	
Total Delay	5.6	73.6		45.2	6.0			41.4		34.9	12.2	
LOS	A	E		D	A			D		C	B	
Approach Delay		71.1			8.0			41.4			17.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			A			D			B	
Queue Length 50th (m)	2.2	182.2		3.3	25.3			21.6		2.5	0.2	
Queue Length 95th (m)	7.6	#366.5		#27.6	46.1			41.7		8.3	9.6	
Internal Link Dist (m)		122.1			94.3			34.9			32.3	
Turn Bay Length (m)				25.0						20.0		
Base Capacity (vph)	376	1251		74	2371			375		224	362	
Starvation Cap Reductn	0	159		0	1082			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	0.12	1.10		0.58	0.64			0.38		0.07	0.13	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 101.7			
Natural Cycle: 120			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 44.1		Intersection LOS: D	
Intersection Capacity Utilization 86.3%		ICU Level of Service E	
Analysis Period (min) 15			

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

Splits and Phases: 2: Lakeshore Road & Elizabeth Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1071	32	40	751	12	44	40	46	14	1	41
Future Volume (vph)	42	1071	32	40	751	12	44	40	46	14	1	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00			0.95		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1493	1674		1015	3172			1407		1321	1158	
Flt Permitted	0.32	1.00		0.09	1.00			0.88		0.57	1.00	
Satd. Flow (perm)	504	1674		101	3172			1256		786	1158	
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)	46	1164	35	43	816	13	48	43	50	15	1	45
RTOR Reduction (vph)	0	1	0	0	1	0	0	20	0	0	37	0
Lane Group Flow (vph)	46	1198	0	43	828	0	0	121	0	15	9	0
Confl. Peds. (#/hr)	16		21	21		16	7					7
Heavy Vehicles (%)	8%	1%	20%	60%	2%	10%	0%	0%	38%	23%	0%	24%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	73.0	73.0		73.0	73.0			14.7		14.7	14.7	
Effective Green, g (s)	76.0	76.0		76.0	76.0			17.7		17.7	17.7	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.17		0.17	0.17	
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)	376	1250		75	2370			218		136	201	
v/s Ratio Prot		c0.72			0.26						0.01	
v/s Ratio Perm	0.09			0.43				c0.10		0.02		
v/c Ratio	0.12	0.96		0.57	0.35			0.56		0.11	0.04	
Uniform Delay, d1	3.6	11.4		5.7	4.4			38.4		35.4	35.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.7	17.3		28.1	0.4			3.1		0.4	0.1	
Delay (s)	4.2	28.7		33.8	4.8			41.5		35.7	35.0	
Level of Service	A	C		C	A			D		D	D	
Approach Delay (s)		27.8			6.2			41.5			35.2	
Approach LOS		C			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.88				
Actuated Cycle Length (s)	101.7	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	86.3%	ICU Level of Service		E	
Analysis Period (min)	15				

c Critical Lane Group

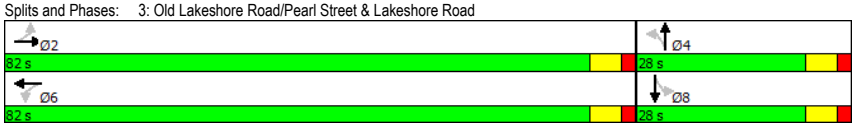
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1063	25	1	727	41	25	3	1	17	1	51
Future Volume (vph)	43	1063	25	1	727	41	25	3	1	17	1	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	0.0		0.0	7.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99				1.00			1.00		1.00		
Frt		0.997			0.992			0.996			0.853	
Flt Protected	0.950			0.950				0.958		0.950		
Satd. Flow (prot)	1624	1656	0	1624	3125	0	0	1630	0	1354	1365	0
Flt Permitted	0.332			0.167				0.714		0.831		
Satd. Flow (perm)	562	1656	0	286	3125	0	0	1215	0	1179	1365	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			13			1			55	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		118.3			120.7			53.5			115.4	
Travel Time (s)		8.5			8.7			3.9			8.3	
Confl. Peds. (#/hr)	20					20			2	2		
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%	3%	0%	0%	3%	0%	0%	0%	0%	20%	0%	7%
Adj. Flow (vph)	47	1155	27	1	790	45	27	3	1	18	1	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	1182	0	1	835	0	0	31	0	18	56	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		28.0	28.0		28.0	28.0	
Total Split (s)	82.0	82.0		82.0	82.0		28.0	28.0		28.0	28.0	
Total Split (%)	74.5%	74.5%		74.5%	74.5%		25.5%	25.5%		25.5%	25.5%	
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	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		Max	Max		None	None		None	None	
Act Effct Green (s)	84.8	84.8		84.8	84.8			10.7		10.7	10.7	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.11		0.11	0.11	
v/c Ratio	0.10	0.84		0.00	0.31			0.24		0.14	0.29	
Control Delay	2.6	13.6		2.0	2.5			43.6		41.9	15.4	
Queue Delay	0.0	10.7		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.6	24.2		2.0	2.5			43.6		41.9	15.4	
LOS	A	C		A	A			D		D	B	
Approach Delay		23.4			2.5			43.6			21.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A			D			C	
Queue Length 50th (m)	1.4	110.1		0.0	15.7			5.5		3.3	0.2	
Queue Length 95th (m)	4.1	#301.3		0.3	24.8			14.4		10.1	11.5	
Internal Link Dist (m)		94.3			96.7			29.5			91.4	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	477	1407		243	2657			293		284	371	
Starvation Cap Reductn	0	216		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	0.10	0.99		0.00	0.31			0.11		0.06	0.15	

Intersection Summary

Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 99.8
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 15.6 Intersection LOS: B
Intersection Capacity Utilization 79.6% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Old Lakeshore Road/Pearl Street & Lakeshore Road



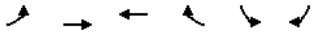
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1063	25	1	727	41	25	3	1	17	1	51
Future Volume (vph)	43	1063	25	1	727	41	25	3	1	17	1	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1608	1656		1624	3125			1630		1348	1364	
Flt Permitted	0.33	1.00		0.17	1.00			0.71		0.83	1.00	
Satd. Flow (perm)	561	1656		286	3125			1215		1178	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)	47	1155	27	1	790	45	27	3	1	18	1	55
RTOR Reduction (vph)	0	1	0	0	2	0	0	1	0	0	50	0
Lane Group Flow (vph)	47	1181	0	1	833	0	0	30	0	18	6	0
Confl. Peds. (#/hr)	20					20			2	2		
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	20%	0%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	82.0	82.0		82.0	82.0			7.0		7.0	7.0	
Effective Green, g (s)	84.0	84.0		84.0	84.0			9.0		9.0	9.0	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.09		0.09	0.09	
Clearance Time (s)	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	
Lane Grp Cap (vph)	466	1377		237	2599			108		104	121	
v/s Ratio Prot		c0.71			0.27						0.00	
v/s Ratio Perm	0.08			0.00				c0.02		0.02		
v/c Ratio	0.10	0.86		0.00	0.32			0.28		0.17	0.05	
Uniform Delay, d1	1.6	5.0		1.4	2.0			43.0		42.6	42.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	5.5		0.0	0.3			1.4		0.8	0.2	
Delay (s)	1.7	10.5		1.5	2.3			44.4		43.4	42.3	
Level of Service	A	B		A	A			D		D	D	
Approach Delay (s)		10.2			2.3			44.4			42.5	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	117	951	676	28	29	61
Future Volume (vph)	117	951	676	28	29	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.995		0.909	
Flt Protected	0.950				0.984	
Satd. Flow (prot)	1608	1676	1666	0	1530	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1608	1676	1666	0	1530	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	127.1		115.7	
Travel Time (s)		8.7	9.2		8.3	
Confl. Peds. (#/hr)	13			13		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	2%	2%	5%	0%	0%
Adj. Flow (vph)	127	1034	735	30	32	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	127	1034	765	0	98	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	117	951	676	28	29	61
Future Volume (Veh/h)	117	951	676	28	29	61
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	127	1034	735	30	32	66
Pedestrians					13	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (m)		121				
pX, platoon unblocked					0.20	
vC, conflicting volume	778				2051	763
vC1, stage 1 conf vol					763	
vC2, stage 2 conf vol					1288	
vCu, unblocked vol	778				4211	763
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	85				69	84
cM capacity (veh/h)	834				103	403

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	127	1034	765	98
Volume Left	127	0	0	32
Volume Right	0	0	30	66
cSH	834	1700	1700	207
Volume to Capacity	0.15	0.61	0.45	0.47
Queue Length 95th (m)	4.3	0.0	0.0	18.5
Control Delay (s)	10.1	0.0	0.0	37.2
Lane LOS	B			E
Approach Delay (s)	1.1		0.0	37.2
Approach LOS				E

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	17	20	124	37	6
Future Volume (vph)	25	17	20	124	37	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.946				0.980	
Flt Protected	0.971			0.993		
Satd. Flow (prot)	1525	0	0	1651	1621	0
Flt Permitted	0.971			0.993		
Satd. Flow (perm)	1525	0	0	1651	1621	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	121.9			115.7	58.9	
Travel Time (s)	8.8			8.3	4.2	
Confl. Peds. (#/hr)	2	4	7			7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	0%	8%	2%	4%	0%
Adj. Flow (vph)	27	18	22	135	40	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	0	0	157	47	0
Sign Control	Stop			Free	Free	

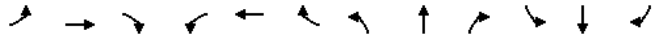
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	17	20	124	37	6
Future Volume (Veh/h)	25	17	20	124	37	6
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)	27	18	22	135	40	7
Pedestrians	7			4	2	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	232	54	54			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	232	54	54			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	96	98	99			
cM capacity (veh/h)	734	1009	1505			

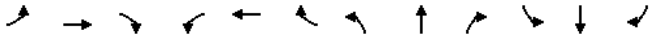
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	45	157	47
Volume Left	27	22	0
Volume Right	18	0	7
cSH	823	1505	1700
Volume to Capacity	0.05	0.01	0.03
Queue Length 95th (m)	1.4	0.4	0.0
Control Delay (s)	9.6	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	1.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization		26.4%	ICU Level of Service A
Analysis Period (min)		15	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	19	10	7	16	10	14	60	8	27	52	24
Future Volume (vph)	10	19	10	7	16	10	14	60	8	27	52	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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												
Frt		0.965			0.959			0.986			0.969	
Flt Protected		0.987			0.989			0.992			0.987	
Satd. Flow (prot)	0	1584	0	0	1560	0	0	1627	0	0	1569	0
Flt Permitted		0.987			0.989			0.992			0.987	
Satd. Flow (perm)	0	1584	0	0	1560	0	0	1627	0	0	1569	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		58.7			121.9			115.4			90.8	
Travel Time (s)		4.2			8.8			8.3			6.5	
Confl. Peds. (#/hr)	11		15	15		11	10		4	4		10
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%	11%	0%	0%	13%	8%	2%	0%	4%	4%	5%
Adj. Flow (vph)	11	21	11	8	17	11	15	65	9	29	57	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	0	0	36	0	0	89	0	0	112	0
Sign Control		Stop			Stop			Stop			Stop	

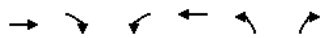
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.4%			ICU Level of Service A
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	19	10	7	16	10	14	60	8	27	52	24
Future Volume (vph)	10	19	10	7	16	10	14	60	8	27	52	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	21	11	8	17	11	15	65	9	29	57	26

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	43	36	89	112
Volume Left (vph)	11	8	15	29
Volume Right (vph)	11	11	9	26
Hadj (s)	-0.05	-0.07	0.02	-0.02
Departure Headway (s)	4.3	4.3	4.2	4.2
Degree Utilization, x	0.05	0.04	0.10	0.13
Capacity (veh/h)	790	791	826	845
Control Delay (s)	7.6	7.5	7.7	7.8
Approach Delay (s)	7.6	7.5	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.7	
Level of Service			A	
Intersection Capacity Utilization			25.4%	ICU Level of Service
Analysis Period (min)			15	



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	435	33	0	300	0	169
Future Volume (vph)	435	33	0	300	0	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	1810	1429	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1810	1429	0	1863	0	1611
Link Speed (k/h)	50			50	50	
Link Distance (m)	135.1			145.3	147.5	
Travel Time (s)	9.7			10.5	10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	13%	2%	2%	2%	2%
Adj. Flow (vph)	473	36	0	326	0	184
Shared Lane Traffic (%)						
Lane Group Flow (vph)	473	36	0	326	0	184
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	435	33	0	300	0	169
Future Volume (Veh/h)	435	33	0	300	0	169
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	473	36	0	326	0	184
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				145		
pX, platoon unblocked					0.91	
vC, conflicting volume			473		799	473
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			473		729	473
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	69
cM capacity (veh/h)			1089		354	591

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	473	36	326	184
Volume Left	0	0	0	0
Volume Right	0	36	0	184
cSH	1700	1700	1700	591
Volume to Capacity	0.28	0.02	0.19	0.31
Queue Length 95th (m)	0.0	0.0	0.0	10.6
Control Delay (s)	0.0	0.0	0.0	13.8
Lane LOS				B
Approach Delay (s)	0.0		0.0	13.8
Approach LOS				B

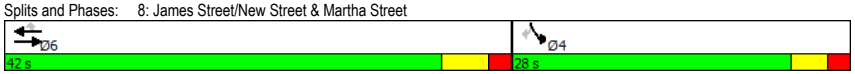
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	604	299	71	10	1
Future Volume (vph)	0	604	299	71	10	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			20.0	25.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		0.97
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1845	1810	1583	1626	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	1845	1810	1548	1626	1566
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				77		1
Link Speed (k/h)		50	50		50	
Link Distance (m)		145.3	340.2		109.6	
Travel Time (s)		10.5	24.5		7.9	
Confl. Peds. (#/hr)				2		6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	2%	11%	0%
Adj. Flow (vph)	0	657	325	77	11	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	657	325	77	11	1
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Detector Phase		6	6	6	4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0	8.0	8.0	8.0
Minimum Split (s)		42.0	42.0	42.0	28.0	28.0
Total Split (s)		42.0	42.0	42.0	28.0	28.0
Total Split (%)		60.0%	60.0%	60.0%	40.0%	40.0%
Yellow Time (s)		4.0	4.0	4.0	3.0	3.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-1.0	-1.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		Max	Max	Max	Max	Max
Act Effct Green (s)		38.0	38.0	38.0	24.0	24.0
Actuated g/C Ratio		0.54	0.54	0.54	0.34	0.34
v/c Ratio		0.66	0.33	0.09	0.02	0.00
Control Delay		15.3	10.1	2.4	15.5	12.0
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		15.3	10.1	2.4	15.5	12.0
LOS		B	B	A	B	B
Approach Delay		15.3	8.6		15.2	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach LOS		B	A		B	
Queue Length 50th (m)		58.9	22.9	0.0	1.0	0.0
Queue Length 95th (m)		93.9	38.2	5.3	4.1	1.0
Internal Link Dist (m)		121.3	316.2		85.6	
Turn Bay Length (m)				20.0	25.0	
Base Capacity (vph)		1001	982	875	557	537
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.66	0.33	0.09	0.02	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 12.8		Intersection LOS: B	
Intersection Capacity Utilization 55.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 8: James Street/New Street & Martha Street



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	604	299	71	10	1
Future Volume (vph)	0	604	299	71	10	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1845	1810	1548	1626	1566
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1845	1810	1548	1626	1566
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	657	325	77	11	1
RTOR Reduction (vph)	0	0	0	35	0	1
Lane Group Flow (vph)	0	657	325	42	11	0
Confl. Peds. (#/hr)				2		6
Heavy Vehicles (%)	0%	3%	5%	2%	11%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Actuated Green, G (s)		36.0	36.0	36.0	23.0	23.0
Effective Green, g (s)		38.0	38.0	38.0	24.0	24.0
Actuated g/C Ratio		0.54	0.54	0.54	0.34	0.34
Clearance Time (s)		6.0	6.0	6.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1001	982	840	557	536
v/s Ratio Prot		c0.36	0.18		c0.01	
v/s Ratio Perm				0.03		0.00
v/c Ratio		0.66	0.33	0.05	0.02	0.00
Uniform Delay, d1		11.4	8.9	7.5	15.2	15.1
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.4	0.9	0.1	0.1	0.0
Delay (s)		14.7	9.8	7.6	15.3	15.1
Level of Service		B	A	A	B	B
Approach Delay (s)		14.7	9.4		15.3	
Approach LOS		B	A		B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	149	0	0	31
Future Volume (vph)	0	0	149	0	0	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	1863	0	0	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	1863	0	0	1863
Link Speed (k/h)	50		50			50
Link Distance (m)	210.4		58.9			147.5
Travel Time (s)	15.1		4.2			10.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	162	0	0	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	162	0	0	34
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	11.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	149	0	0	31
Future Volume (Veh/h)	0	0	149	0	0	31
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	162	0	0	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	196	162			162	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	196	162			162	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	793	883			1417	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	162	34
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1417
Volume to Capacity	0.00	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.2%	ICU Level of Service	A
Analysis Period (min)	15		

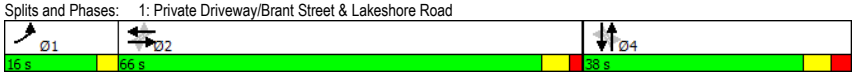
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	814	15	2	1181	156	5	8	0	192	6	376
Future Volume (vph)	222	814	15	2	1181	156	5	8	0	192	6	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	25.0		0.0	0.0		0.0	0.0		15.0
Storage Lanes	1		0	1		0	0		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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			1.00		0.99	0.95	
Frt		0.997			0.982						0.853	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1608	1652	0	1624	3072	0	0	1679	0	1518	1364	0
Flt Permitted	0.080			0.080				0.669		0.748		
Satd. Flow (perm)	135	1652	0	137	3072	0	0	1139	0	1186	1364	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			18						221	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			146.1			72.5			121.7	
Travel Time (s)		11.4			10.5			5.2			8.8	
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
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 (%)	1%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Adj. Flow (vph)	241	885	16	2	1284	170	5	9	0	209	7	409
Shared Lane Traffic (%)												
Lane Group Flow (vph)	241	901	0	2	1454	0	0	14	0	209	416	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Detector Phase	1	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.0	33.0		33.0	33.0		38.0	38.0		38.0	38.0	
Total Split (s)	16.0	66.0		66.0	66.0		38.0	38.0		38.0	38.0	
Total Split (%)	13.3%	55.0%		55.0%	55.0%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	76.3	62.2		62.2	62.2			27.1		27.1	27.1	
Actuated g/C Ratio	0.67	0.55		0.55	0.55			0.24		0.24	0.24	
v/c Ratio	0.93	0.99		0.03	0.86			0.05		0.74	0.84	
Control Delay	68.9	55.7		15.5	29.2			32.4		55.7	34.9	
Queue Delay	0.0	0.0		0.0	41.0			0.0		0.0	0.0	
Total Delay	68.9	55.7		15.5	70.2			32.4		55.7	34.9	
LOS	E	E		B	E			C		E	C	
Approach Delay		58.5			70.1			32.4			41.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			E			C			D	
Queue Length 50th (m)	37.6	~203.8		0.2	146.6			2.5		45.1	45.6	
Queue Length 95th (m)	#95.7	#325.0		1.8	#212.0			8.0		73.0	89.0	
Internal Link Dist (m)		134.0			122.1			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	260	906		75	1693			342		356	564	
Starvation Cap Reductn	0	0		0	353			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	0.93	0.99		0.03	1.09			0.04		0.59	0.74	

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 113.4
Natural Cycle: 120
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 60.4 Intersection LOS: E
Intersection Capacity Utilization 94.7% ICU Level of Service F
Analysis Period (min) 15
~ 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.

Splits and Phases: 1: Private Driveway/Brant Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	814	15	2	1181	156	5	8	0	192	6	376
Future Volume (vph)	222	814	15	2	1181	156	5	8	0	192	6	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		0.99	1.00	
Frt	1.00	1.00		1.00	0.98			1.00		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1608	1653		1624	3074			1673		1507	1366	
Flt Permitted	0.08	1.00		0.08	1.00			0.67		0.75	1.00	
Satd. Flow (perm)	135	1653		136	3074			1139		1187	1366	
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)	241	885	16	2	1284	170	5	9	0	209	7	409
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	168	0
Lane Group Flow (vph)	241	901	0	2	1446	0	0	14	0	209	248	0
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
Heavy Vehicles (%)	1%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Actuated Green, G (s)	73.2	60.2		60.2	60.2			24.1		24.1	24.1	
Effective Green, g (s)	73.2	62.2		62.2	62.2			27.1		27.1	27.1	
Actuated g/C Ratio	0.65	0.55		0.55	0.55			0.24		0.24	0.24	
Clearance Time (s)	3.0	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)	256	907		74	1687			272		283	326	
v/s Ratio Prot	c0.11	c0.54			0.47						c0.18	
v/s Ratio Perm	0.50			0.01				0.01		0.18		
v/c Ratio	0.94	0.99		0.03	0.86			0.05		0.74	0.76	
Uniform Delay, d1	32.0	25.3		11.7	21.8			33.2		39.8	40.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	40.4	28.2		0.7	5.9			0.1		9.7	10.0	
Delay (s)	72.3	53.6		12.4	27.6			33.3		49.5	50.1	
Level of Service	E	D		B	C			C		D	D	
Approach Delay (s)		57.5			27.6			33.3			49.9	
Approach LOS		E			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	113.3	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	94.7%	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)	44	859	44	39	1146	28	39	33	31	43	0	79
Future Volume (vph)	44	859	44	39	1146	28	39	33	31	43	0	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	25.0		0.0	0.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			0.99		0.99	0.98	
Frt		0.993			0.996			0.959			0.850	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1450	1678	0	1083	3169	0	0	1421	0	1504	1291	0
Flt Permitted	0.190			0.214				0.850		0.602		
Satd. Flow (perm)	290	1678	0	244	3169	0	0	1226	0	948	1291	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			5			17			98	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		146.1			118.3			58.9			56.3	
Travel Time (s)		10.5			8.5			4.2			4.1	
Confl. Peds. (#/hr)	4		18	18		4	8		3	3		8
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 (%)	12%	1%	0%	50%	2%	4%	33%	0%	0%	8%	0%	10%
Adj. Flow (vph)	48	934	48	42	1246	30	42	36	34	47	0	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	982	0	42	1276	0	0	112	0	47	86	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		33.0	33.0		33.0	33.0	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	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	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	85.8	85.8		85.8	85.8			16.9		16.9	16.9	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.15		0.15	0.15	
v/c Ratio	0.21	0.75		0.22	0.52			0.56		0.33	0.31	
Control Delay	7.0	12.6		7.8	6.1			46.5		46.3	9.1	
Queue Delay	0.0	8.7		0.0	1.7			0.0		0.0	0.0	
Total Delay	7.0	21.3		7.8	7.8			46.5		46.3	9.1	
LOS	A	C		A	A			D		D	A	
Approach Delay		20.6			7.8			46.5			22.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A			D			C	
Queue Length 50th (m)	2.4	97.0		2.1	46.0			19.5		9.3	0.0	
Queue Length 95th (m)	8.9	204.4		8.5	79.5			38.1		20.9	11.1	
Internal Link Dist (m)		122.1			94.3			34.9			32.3	
Turn Bay Length (m)				25.0						20.0		
Base Capacity (vph)	224	1301		189	2458			334		248	410	
Starvation Cap Reductn	0	289		0	956			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	0.21	0.97		0.22	0.85			0.34		0.19	0.21	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 110.7			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 73.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Lakeshore Road & Elizabeth Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	859	44	39	1146	28	39	33	31	43	0	79
Future Volume (vph)	44	859	44	39	1146	28	39	33	31	43	0	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00			0.96		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1449	1677		1078	3171			1416		1497	1292	
Flt Permitted	0.19	1.00		0.21	1.00			0.85		0.60	1.00	
Satd. Flow (perm)	290	1677		243	3171			1227		949	1292	
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)	48	934	48	42	1246	30	42	36	34	47	0	86
RTOR Reduction (vph)	0	1	0	0	1	0	0	14	0	0	73	0
Lane Group Flow (vph)	48	981	0	42	1275	0	0	98	0	47	13	0
Confl. Peds. (#/hr)	4		18	18		4	8		3	3		8
Heavy Vehicles (%)	12%	1%	0%	50%	2%	4%	33%	0%	0%	8%	0%	10%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	82.9	82.9		82.9	82.9			13.9		13.9	13.9	
Effective Green, g (s)	85.9	85.9		85.9	85.9			16.9		16.9	16.9	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.15		0.15	0.15	
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)	224	1300		188	2458			187		144	197	
v/s Ratio Prot		c0.58			0.40						0.01	
v/s Ratio Perm	0.17			0.17				c0.08		0.05		
v/c Ratio	0.21	0.75		0.22	0.52			0.52		0.33	0.07	
Uniform Delay, d1	3.4	6.7		3.4	4.7			43.2		41.9	40.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.2	4.1		2.7	0.8			2.6		1.3	0.1	
Delay (s)	5.5	10.8		6.1	5.5			45.8		43.2	40.3	
Level of Service	A	B		A	A			D		D	D	
Approach Delay (s)		10.6			5.5			45.8			41.4	
Approach LOS		B			A			D			D	

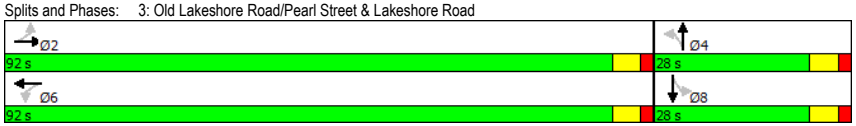
Intersection Summary					
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.72				
Actuated Cycle Length (s)	110.8	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	73.9%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

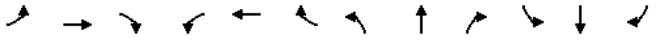
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	883	10	5	1122	57	35	10	1	35	4	56
Future Volume (vph)	41	883	10	5	1122	57	35	10	1	35	4	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	0.0		0.0	7.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			1.00		1.00	0.99	
Frt		0.998			0.993			0.997			0.859	
Flt Protected	0.950			0.950				0.963		0.950		
Satd. Flow (prot)	1624	1673	0	1624	3154	0	0	1641	0	1464	1448	0
Flt Permitted	0.200			0.250				0.735		0.776		
Satd. Flow (perm)	340	1673	0	428	3154	0	0	1250	0	1190	1448	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			11			1			61	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		118.3			120.7			53.5			115.4	
Travel Time (s)		8.5			8.7			3.9			8.3	
Confl. Peds. (#/hr)	20		3	3		20	2		2	2		2
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%	2%	0%	0%	2%	2%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	45	960	11	5	1220	62	38	11	1	38	4	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	971	0	5	1282	0	0	50	0	38	65	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		28.0	28.0		28.0	28.0	
Total Split (s)	92.0	92.0		92.0	92.0		28.0	28.0		28.0	28.0	
Total Split (%)	76.7%	76.7%		76.7%	76.7%		23.3%	23.3%		23.3%	23.3%	
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	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		Max	Max		None	None		None	None	
Act Effct Green (s)	92.0	92.0		92.0	92.0			12.0		12.0	12.0	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.11		0.11	0.11	
v/c Ratio	0.16	0.68		0.01	0.48			0.36		0.29	0.30	
Control Delay	3.9	7.5		2.4	3.6			51.3		49.9	16.4	
Queue Delay	0.0	4.6		0.0	0.0			0.0		0.0	0.0	
Total Delay	3.9	12.1		2.4	3.6			51.3		49.9	16.4	
LOS	A	B		A	A			D		D	B	
Approach Delay		11.7			3.6			51.3			28.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A			D			C	
Queue Length 50th (m)	1.6	68.5		0.1	33.2			10.2		7.9	0.8	
Queue Length 95th (m)	5.3	138.7		1.0	55.1			22.5		18.5	13.6	
Internal Link Dist (m)		94.3			96.7			29.5			91.4	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	288	1421		363	2680			278		263	368	
Starvation Cap Reductn	0	371		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	0.92		0.01	0.48			0.18		0.14	0.18	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 108.3			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 9.0		Intersection LOS: A	
Intersection Capacity Utilization 69.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Old Lakeshore Road/Pearl Street & Lakeshore Road

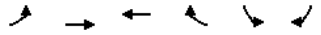




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	883	10	5	1122	57	35	10	1	35	4	56
Future Volume (vph)	41	883	10	5	1122	57	35	10	1	35	4	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1616	1674		1623	3154			1639		1457	1449	
Flt Permitted	0.20	1.00		0.25	1.00			0.74		0.78	1.00	
Satd. Flow (perm)	340	1674		428	3154			1250		1190	1449	
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)	45	960	11	5	1220	62	38	11	1	38	4	61
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	55	0
Lane Group Flow (vph)	45	971	0	5	1280	0	0	49	0	38	10	0
Confl. Peds. (#/hr)	20		3	3		20	2		2	2		2
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	0%	0%	11%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	89.1	89.1		89.1	89.1			8.3		8.3	8.3	
Effective Green, g (s)	91.1	91.1		91.1	91.1			10.3		10.3	10.3	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.09		0.09	0.09	
Clearance Time (s)	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	
Lane Grp Cap (vph)	283	1393		356	2626			117		112	136	
v/s Ratio Prot		c0.58			0.41						0.01	
v/s Ratio Perm	0.13			0.01				c0.04		0.03		
v/c Ratio	0.16	0.70		0.01	0.49			0.42		0.34	0.07	
Uniform Delay, d1	1.8	3.6		1.5	2.6			46.7		46.4	45.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.5		0.1	0.7			2.4		1.8	0.2	
Delay (s)	2.0	5.2		1.6	3.2			49.2		48.2	45.4	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		5.0			3.2			49.2			46.4	
Approach LOS		A			A			D			D	

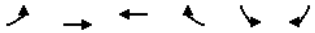
Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	97	792	1139	56	19	32
Future Volume (vph)	97	792	1139	56	19	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.994		0.916	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1624	1693	1677	0	1474	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1624	1693	1677	0	1474	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	127.1		115.7	
Travel Time (s)		8.7	9.2		8.3	
Confl. Peds. (#/hr)	12			12		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	1%	8%	0%	7%
Adj. Flow (vph)	105	861	1238	61	21	35
Shared Lane Traffic (%)						
Lane Group Flow (vph)	105	861	1299	0	56	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	97	792	1139	56	19	32
Future Volume (Veh/h)	97	792	1139	56	19	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	105	861	1238	61	21	35
Pedestrians		1			12	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.2			1.2	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (m)		121				
pX, platoon unblocked					0.77	
vC, conflicting volume	1311				2352	1282
vC1, stage 1 conf vol					1280	
vC2, stage 2 conf vol					1071	
vCu, unblocked vol	1311				2609	1282
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.4
p0 queue free %	80				87	82
cM capacity (veh/h)	529				166	195

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	105	861	1299	56
Volume Left	105	0	0	21
Volume Right	0	0	61	35
cSH	529	1700	1700	183
Volume to Capacity	0.20	0.51	0.76	0.31
Queue Length 95th (m)	5.9	0.0	0.0	9.8
Control Delay (s)	13.5	0.0	0.0	33.1
Lane LOS	B			D
Approach Delay (s)	1.5		0.0	33.1
Approach LOS				D

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	32	30	24	125	27	5
Future Volume (vph)	32	30	24	125	27	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.934				0.980	
Flt Protected	0.975			0.992		
Satd. Flow (prot)	1557	0	0	1696	1676	0
Flt Permitted	0.975			0.992		
Satd. Flow (perm)	1557	0	0	1696	1676	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	121.9			115.7	59.2	
Travel Time (s)	8.8			8.3	4.3	
Confl. Peds. (#/hr)		1	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	35	33	26	136	29	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	68	0	0	162	34	0
Sign Control	Stop			Free	Free	

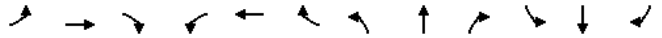
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	30	24	125	27	5
Future Volume (Veh/h)	32	30	24	125	27	5
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)	35	33	26	136	29	5
Pedestrians	5			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	224	38	39			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	224	38	39			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	98			
cM capacity (veh/h)	752	1035	1577			

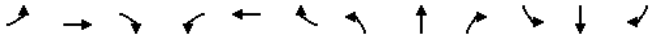
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	68	162	34
Volume Left	35	26	0
Volume Right	33	0	5
cSH	867	1577	1700
Volume to Capacity	0.08	0.02	0.02
Queue Length 95th (m)	2.0	0.4	0.0
Control Delay (s)	9.5	1.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	1.3	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		3.2		
Intersection Capacity Utilization		26.5%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	26	12	8	21	16	30	61	9	31	101	35
Future Volume (vph)	18	26	12	8	21	16	30	61	9	31	101	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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												
Frt		0.971			0.953			0.988			0.972	
Flt Protected		0.984			0.991			0.985			0.991	
Satd. Flow (prot)	0	1634	0	0	1615	0	0	1664	0	0	1647	0
Flt Permitted		0.984			0.991			0.985			0.991	
Satd. Flow (perm)	0	1634	0	0	1615	0	0	1664	0	0	1647	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		58.7			121.9			115.4			90.8	
Travel Time (s)		4.2			8.8			8.3			6.5	
Confl. Peds. (#/hr)	13		18	18		13	10		4	4		10
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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	20	28	13	9	23	17	33	66	10	34	110	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	61	0	0	49	0	0	109	0	0	182	0
Sign Control		Stop			Stop			Stop			Stop	

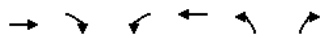
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.6%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	26	12	8	21	16	30	61	9	31	101	35
Future Volume (vph)	18	26	12	8	21	16	30	61	9	31	101	35
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	28	13	9	23	17	33	66	10	34	110	38

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	61	49	109	182
Volume Left (vph)	20	9	33	34
Volume Right (vph)	13	17	10	38
Hadj (s)	-0.06	-0.17	0.01	-0.09
Departure Headway (s)	4.5	4.5	4.4	4.2
Degree Utilization, x	0.08	0.06	0.13	0.21
Capacity (veh/h)	732	745	793	824
Control Delay (s)	7.9	7.7	8.0	8.3
Approach Delay (s)	7.9	7.7	8.0	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.1	
Level of Service			A	
Intersection Capacity Utilization			28.6%	ICU Level of Service
Analysis Period (min)			15	



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	362	32	0	823	0	137
Future Volume (vph)	362	32	0	823	0	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	1863	1538	0	1900	0	1644
Flt Permitted						
Satd. Flow (perm)	1863	1538	0	1900	0	1644
Link Speed (k/h)	50			50	50	
Link Distance (m)	110.3			205.0	191.5	
Travel Time (s)	7.9			14.8	13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	5%	0%	0%	0%	0%
Adj. Flow (vph)	393	35	0	895	0	149
Shared Lane Traffic (%)						
Lane Group Flow (vph)	393	35	0	895	0	149
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	362	32	0	823	0	137
Future Volume (Veh/h)	362	32	0	823	0	137
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	393	35	0	895	0	149
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				205		
pX, platoon unblocked					0.82	
vC, conflicting volume			393		1288	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			393		1242	393
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	77
cM capacity (veh/h)			1177		160	660

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	393	35	895	149
Volume Left	0	0	0	0
Volume Right	0	35	0	149
cSH	1700	1700	1700	660
Volume to Capacity	0.23	0.02	0.53	0.23
Queue Length 95th (m)	0.0	0.0	0.0	6.9
Control Delay (s)	0.0	0.0	0.0	12.0
Lane LOS				B
Approach Delay (s)	0.0		0.0	12.0
Approach LOS				B

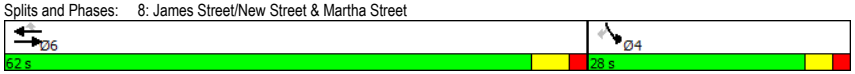
Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	499	822	99	8	1
Future Volume (vph)	0	499	822	99	8	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			20.0	25.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1881	1599	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1881	1563	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				48		1
Link Speed (k/h)		50	50		50	
Link Distance (m)		205.0	135.0		164.4	
Travel Time (s)		14.8	9.7		11.8	
Confl. Peds. (#/hr)				2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	1%	1%	0%	0%
Adj. Flow (vph)	0	542	893	108	9	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	542	893	108	9	1
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Detector Phase		6	6	6	4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0	8.0	8.0	8.0
Minimum Split (s)		42.0	42.0	42.0	28.0	28.0
Total Split (s)		62.0	62.0	62.0	28.0	28.0
Total Split (%)		68.9%	68.9%	68.9%	31.1%	31.1%
Yellow Time (s)		4.0	4.0	4.0	3.0	3.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-1.0	-1.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		Max	Max	Max	None	None
Act Effct Green (s)		76.6	76.6	76.6	9.0	9.0
Actuated g/C Ratio		0.96	0.96	0.96	0.11	0.11
v/c Ratio		0.30	0.49	0.07	0.04	0.01
Control Delay		1.1	2.0	0.6	34.4	28.0
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		1.1	2.0	0.6	34.4	28.0
LOS		A	A	A	C	C
Approach Delay		1.1	1.8		33.7	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach LOS		A	A		C	
Queue Length 50th (m)		0.0	0.0	0.0	1.3	0.0
Queue Length 95th (m)		27.9	62.8	4.0	6.1	1.5
Internal Link Dist (m)		181.0	111.0		140.4	
Turn Bay Length (m)				20.0	25.0	
Base Capacity (vph)		1793	1810	1506	546	489
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.30	0.49	0.07	0.02	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 79.6			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 1.8		Intersection LOS: A	
Intersection Capacity Utilization 56.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 8: James Street/New Street & Martha Street



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	499	822	99	8	1
Future Volume (vph)	0	499	822	99	8	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1863	1881	1563	1805	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1863	1881	1563	1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	542	893	108	9	1
RTOR Reduction (vph)	0	0	0	6	0	1
Lane Group Flow (vph)	0	542	893	102	9	0
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	2%	1%	1%	0%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Actuated Green, G (s)		71.3	71.3	71.3	1.4	1.4
Effective Green, g (s)		73.3	73.3	73.3	2.4	2.4
Actuated g/C Ratio		0.88	0.88	0.88	0.03	0.03
Clearance Time (s)		6.0	6.0	6.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1631	1647	1368	51	46
v/s Ratio Prot		0.29	c0.47		c0.00	
v/s Ratio Perm				0.07		0.00
v/c Ratio		0.33	0.54	0.07	0.18	0.00
Uniform Delay, d1		0.9	1.2	0.7	39.7	39.5
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	1.3	0.1	1.7	0.0
Delay (s)		1.5	2.5	0.8	41.3	39.5
Level of Service		A	A	A	D	D
Approach Delay (s)		1.5	2.3		41.2	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	2.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	83.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	157	0	0	18
Future Volume (vph)	0	0	157	0	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	1863	0	0	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	1863	0	0	1863
Link Speed (k/h)	50		50			50
Link Distance (m)	205.3		59.2			191.5
Travel Time (s)	14.8		4.3			13.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	171	0	0	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	171	0	0	20
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	11.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	157	0	0	18
Future Volume (Veh/h)	0	0	157	0	0	18
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	171	0	0	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	191	171			171	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	191	171			171	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	798	873			1406	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	171	20
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1406
Volume to Capacity	0.00	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G

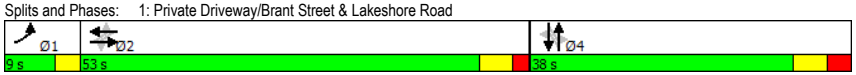
2027 Total Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	1055	8	1	762	170	5	3	1	138	1	202
Future Volume (vph)	230	1055	8	1	762	170	5	3	1	138	1	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	25.0		0.0	0.0		0.0	0.0		15.0
Storage Lanes	1		0	1		0	0		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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			0.99			1.00		0.99	0.99	
Frt		0.999			0.973			0.985			0.851	
Flt Protected	0.950			0.950				0.973		0.950		
Satd. Flow (prot)	1547	1643	0	812	2988	0	0	1402	0	1608	1381	0
Flt Permitted	0.218			0.081				0.839		0.752		
Satd. Flow (perm)	354	1643	0	69	2988	0	0	1208	0	1266	1381	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			38			1			220	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			146.1			72.5			121.7	
Travel Time (s)		11.4			10.5			5.2			8.8	
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
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 (%)	5%	4%	0%	100%	5%	5%	0%	50%	0%	1%	0%	4%
Adj. Flow (vph)	250	1147	9	1	828	185	5	3	1	150	1	220
Shared Lane Traffic (%)												
Lane Group Flow (vph)	250	1156	0	1	1013	0	0	9	0	150	221	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Detector Phase	1	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.0	33.0		33.0	33.0		38.0	38.0		38.0	38.0	
Total Split (s)	9.0	53.0		53.0	53.0		38.0	38.0		38.0	38.0	
Total Split (%)	9.0%	53.0%		53.0%	53.0%		38.0%	38.0%		38.0%	38.0%	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	56.1	49.1		49.1	49.1			18.1		18.1	18.1	
Actuated g/C Ratio	0.67	0.58		0.58	0.58			0.21		0.21	0.21	
v/c Ratio	0.78	1.21		0.03	0.58			0.03		0.55	0.47	
Control Delay	27.0	124.4		11.0	13.0			24.0		37.3	7.6	
Queue Delay	0.0	0.0		0.0	0.4			0.0		0.0	0.0	
Total Delay	27.0	124.4		11.0	13.4			24.0		37.3	7.6	
LOS	C	F		B	B			C		D	A	
Approach Delay		107.1			13.3			24.0			19.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			B			C			B	
Queue Length 50th (m)	12.7	~242.9		0.1	49.9			1.1		22.7	0.1	
Queue Length 95th (m)	#45.8	#360.5		1.0	83.3			4.8		41.1	17.0	
Internal Link Dist (m)		134.0			122.1			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	320	957		40	1756			488		511	689	
Starvation Cap Reductn	0	0		0	282			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	0.78	1.21		0.03	0.69			0.02		0.29	0.32	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 84.3			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.21			
Intersection Signal Delay: 61.3		Intersection LOS: E	
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			
~ 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.			

Splits and Phases: 1: Private Driveway/Brant Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	1055	8	1	762	170	5	3	1	138	1	202
Future Volume (vph)	230	1055	8	1	762	170	5	3	1	138	1	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97			0.98		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1546	1642		812	2988			1402		1601	1381	
Flt Permitted	0.22	1.00		0.08	1.00			0.84		0.75	1.00	
Satd. Flow (perm)	355	1642		70	2988			1209		1267	1381	
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)	250	1147	9	1	828	185	5	3	1	150	1	220
RTOR Reduction (vph)	0	0	0	0	16	0	0	1	0	0	173	0
Lane Group Flow (vph)	250	1156	0	1	997	0	0	8	0	150	48	0
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
Heavy Vehicles (%)	5%	4%	0%	100%	5%	5%	0%	50%	0%	1%	0%	4%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Actuated Green, G (s)	53.1	47.1		47.1	47.1			15.1		15.1	15.1	
Effective Green, g (s)	53.1	49.1		49.1	49.1			18.1		18.1	18.1	
Actuated g/C Ratio	0.63	0.58		0.58	0.58			0.21		0.21	0.21	
Clearance Time (s)	3.0	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)	308	957		40	1742			259		272	296	
v/s Ratio Prot	c0.06	c0.70			0.33						0.03	
v/s Ratio Perm	0.45			0.01				0.01		c0.12		
v/c Ratio	0.81	1.21		0.03	0.57			0.03		0.55	0.16	
Uniform Delay, d1	8.4	17.6		7.4	11.0			26.1		29.4	26.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	14.9	103.3		1.2	1.4			0.1		2.4	0.3	
Delay (s)	23.3	120.8		8.6	12.4			26.2		31.8	27.1	
Level of Service	C	F		A	B			C		C	C	
Approach Delay (s)		103.5			12.4			26.2			29.0	
Approach LOS		F			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	60.4	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	84.2	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	93.4%	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)	43	1074	32	40	759	12	44	40	46	14	1	44
Future Volume (vph)	43	1074	32	40	759	12	44	40	46	14	1	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	25.0		0.0	0.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			1.00			0.98	
Frt		0.996			0.998			0.952			0.853	
Flt Protected	0.950			0.950				0.983		0.950		
Satd. Flow (prot)	1504	1674	0	1015	3173	0	0	1410	0	1321	1157	0
Flt Permitted	0.317			0.093				0.876		0.565		
Satd. Flow (perm)	498	1674	0	99	3173	0	0	1253	0	785	1157	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			3			24			48	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		146.1			118.3			58.9			56.3	
Travel Time (s)		10.5			8.5			4.2			4.1	
Confl. Peds. (#/hr)	16		21	21		16	7					7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	1%	20%	60%	2%	10%	0%	0%	38%	23%	0%	24%
Adj. Flow (vph)	47	1167	35	43	825	13	48	43	50	15	1	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	1202	0	43	838	0	0	141	0	15	49	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		33.0	33.0		33.0	33.0	
Total Split (s)	77.0	77.0		77.0	77.0		33.0	33.0		33.0	33.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	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	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	76.0	76.0		76.0	76.0			17.8		17.8	17.8	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.17		0.17	0.17	
v/c Ratio	0.13	0.96		0.59	0.35			0.59		0.11	0.20	
Control Delay	5.7	32.2		46.3	5.4			41.3		34.8	12.0	
Queue Delay	0.0	42.4		0.0	0.6			0.0		0.0	0.0	
Total Delay	5.7	74.6		46.3	6.1			41.3		34.8	12.0	
LOS	A	E		D	A			D		C	B	
Approach Delay		72.0			8.0			41.3			17.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			A			D			B	
Queue Length 50th (m)	2.3	183.5		3.3	25.7			21.6		2.5	0.2	
Queue Length 95th (m)	7.9	#368.9		#27.8	47.0			41.7		8.3	9.8	
Internal Link Dist (m)		122.1			94.3			34.9			32.3	
Turn Bay Length (m)				25.0						20.0		
Base Capacity (vph)	371	1250		73	2370			375		224	364	
Starvation Cap Reductn	0	158		0	1078			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	0.13	1.10		0.59	0.65			0.38		0.07	0.13	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 101.8			
Natural Cycle: 120			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 44.5		Intersection LOS: D	
Intersection Capacity Utilization 86.5%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Lakeshore Road & Elizabeth Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1074	32	40	759	12	44	40	46	14	1	44
Future Volume (vph)	43	1074	32	40	759	12	44	40	46	14	1	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00			0.95		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1493	1674		1015	3172			1407		1321	1158	
Flt Permitted	0.32	1.00		0.09	1.00			0.88		0.57	1.00	
Satd. Flow (perm)	499	1674		99	3172			1254		786	1158	
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)	47	1167	35	43	825	13	48	43	50	15	1	48
RTOR Reduction (vph)	0	1	0	0	1	0	0	20	0	0	40	0
Lane Group Flow (vph)	47	1201	0	43	837	0	0	121	0	15	9	0
Confl. Peds. (#/hr)	16		21	21		16	7					7
Heavy Vehicles (%)	8%	1%	20%	60%	2%	10%	0%	0%	38%	23%	0%	24%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	73.0	73.0		73.0	73.0			14.7		14.7	14.7	
Effective Green, g (s)	76.0	76.0		76.0	76.0			17.7		17.7	17.7	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.17		0.17	0.17	
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)	372	1250		73	2370			218		136	201	
v/s Ratio Prot		c0.72			0.26						0.01	
v/s Ratio Perm	0.09			0.43				c0.10		0.02		
v/c Ratio	0.13	0.96		0.59	0.35			0.56		0.11	0.05	
Uniform Delay, d1	3.6	11.5		5.8	4.4			38.4		35.4	35.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.7	17.7		30.4	0.4			3.1		0.4	0.1	
Delay (s)	4.3	29.2		36.2	4.8			41.5		35.7	35.1	
Level of Service	A	C		D	A			D		D	D	
Approach Delay (s)		28.3			6.4			41.5			35.2	
Approach LOS		C			A			D			D	

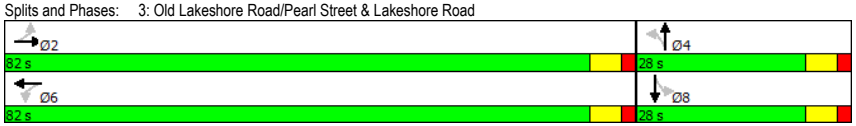
Intersection Summary					
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.88				
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	86.5%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

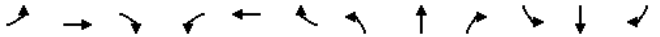
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1065	25	1	732	41	25	3	1	17	1	54
Future Volume (vph)	44	1065	25	1	732	41	25	3	1	17	1	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	0.0		0.0	7.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99				1.00			1.00		1.00		
Frt		0.997			0.992			0.996			0.852	
Flt Protected	0.950			0.950				0.958		0.950		
Satd. Flow (prot)	1624	1656	0	1624	3125	0	0	1630	0	1354	1363	0
Flt Permitted	0.329			0.166				0.711		0.831		
Satd. Flow (perm)	557	1656	0	284	3125	0	0	1210	0	1179	1363	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			13			1			59	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		118.3			120.7			53.5			115.4	
Travel Time (s)		8.5			8.7			3.9			8.3	
Confl. Peds. (#/hr)	20					20			2	2		
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%	3%	0%	0%	3%	0%	0%	0%	0%	20%	0%	7%
Adj. Flow (vph)	48	1158	27	1	796	45	27	3	1	18	1	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	1185	0	1	841	0	0	31	0	18	60	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		28.0	28.0		28.0	28.0	
Total Split (s)	82.0	82.0		82.0	82.0		28.0	28.0		28.0	28.0	
Total Split (%)	74.5%	74.5%		74.5%	74.5%		25.5%	25.5%		25.5%	25.5%	
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	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		Max	Max		None	None		None	None	
Act Effct Green (s)	84.8	84.8		84.8	84.8			10.7		10.7	10.7	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.11		0.11	0.11	
v/c Ratio	0.10	0.84		0.00	0.32			0.24		0.14	0.30	
Control Delay	2.6	13.7		2.0	2.5			43.7		41.9	15.3	
Queue Delay	0.0	10.8		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.6	24.5		2.0	2.5			43.7		41.9	15.3	
LOS	A	C		A	A			D		D	B	
Approach Delay		23.6			2.5			43.7			21.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A			D			C	
Queue Length 50th (m)	1.4	111.4		0.0	15.8			5.5		3.3	0.2	
Queue Length 95th (m)	4.2	#302.1		0.3	25.2			14.4		10.1	11.9	
Internal Link Dist (m)		94.3			96.7			29.5			91.4	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	473	1407		241	2657			292		284	373	
Starvation Cap Reductn	0	214		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	0.10	0.99		0.00	0.32			0.11		0.06	0.16	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 99.8			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 79.7%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Old Lakeshore Road/Pearl Street & Lakeshore Road

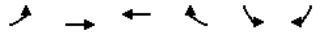




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1065	25	1	732	41	25	3	1	17	1	54
Future Volume (vph)	44	1065	25	1	732	41	25	3	1	17	1	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1608	1656		1624	3125			1630		1348	1364	
Flt Permitted	0.33	1.00		0.17	1.00			0.71		0.83	1.00	
Satd. Flow (perm)	558	1656		284	3125			1210		1178	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)	48	1158	27	1	796	45	27	3	1	18	1	59
RTOR Reduction (vph)	0	1	0	0	2	0	0	1	0	0	54	0
Lane Group Flow (vph)	48	1184	0	1	839	0	0	30	0	18	6	0
Confl. Peds. (#/hr)	20					20			2	2		
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	20%	0%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	82.0	82.0		82.0	82.0			7.0		7.0	7.0	
Effective Green, g (s)	84.0	84.0		84.0	84.0			9.0		9.0	9.0	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.09		0.09	0.09	
Clearance Time (s)	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	
Lane Grp Cap (vph)	464	1377		236	2599			107		104	121	
v/s Ratio Prot		c0.72			0.27						0.00	
v/s Ratio Perm	0.09			0.00				c0.02		0.02		
v/c Ratio	0.10	0.86		0.00	0.32			0.28		0.17	0.05	
Uniform Delay, d1	1.6	5.0		1.4	2.0			43.0		42.6	42.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	5.7		0.0	0.3			1.4		0.8	0.2	
Delay (s)	1.7	10.7		1.5	2.3			44.4		43.4	42.3	
Level of Service	A	B		A	A			D		D	D	
Approach Delay (s)		10.4			2.3			44.4			42.5	
Approach LOS		B			A			D			D	

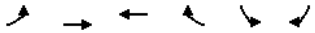
Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	119	951	676	30	42	66
Future Volume (vph)	119	951	676	30	42	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.994		0.918	
Flt Protected	0.950				0.981	
Satd. Flow (prot)	1608	1676	1664	0	1540	0
Flt Permitted	0.950				0.981	
Satd. Flow (perm)	1608	1676	1664	0	1540	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	127.1		115.7	
Travel Time (s)		8.7	9.2		8.3	
Confl. Peds. (#/hr)	13			13		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	2%	2%	5%	0%	0%
Adj. Flow (vph)	129	1034	735	33	46	72
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	1034	768	0	118	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	119	951	676	30	42	66
Future Volume (Veh/h)	119	951	676	30	42	66
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	129	1034	735	33	46	72
Pedestrians					13	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (m)		121				
pX, platoon unblocked					0.20	
vC, conflicting volume	781				2056	764
vC1, stage 1 conf vol					764	
vC2, stage 2 conf vol					1292	
vCu, unblocked vol	781				4236	764
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	84				54	82
cM capacity (veh/h)	832				101	402

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	129	1034	768	118
Volume Left	129	0	0	46
Volume Right	0	0	33	72
cSH	832	1700	1700	186
Volume to Capacity	0.16	0.61	0.45	0.63
Queue Length 95th (m)	4.4	0.0	0.0	29.2
Control Delay (s)	10.1	0.0	0.0	53.0
Lane LOS	B			F
Approach Delay (s)	1.1		0.0	53.0
Approach LOS				F

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	29	17	20	128	54	14
Future Volume (vph)	29	17	20	128	54	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.951				0.973	
Flt Protected	0.969			0.993		
Satd. Flow (prot)	1527	0	0	1651	1612	0
Flt Permitted	0.969			0.993		
Satd. Flow (perm)	1527	0	0	1651	1612	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	121.9			115.7	58.9	
Travel Time (s)	8.8			8.3	4.2	
Confl. Peds. (#/hr)	2	4	7			7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	0%	8%	2%	4%	0%
Adj. Flow (vph)	32	18	22	139	59	15
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	161	74	0
Sign Control	Stop			Free	Free	

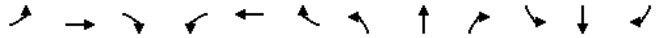
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	17	20	128	54	14
Future Volume (Veh/h)	29	17	20	128	54	14
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)	32	18	22	139	59	15
Pedestrians	7			4	2	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	258	78	81			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	258	78	81			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	95	98	99			
cM capacity (veh/h)	708	980	1471			

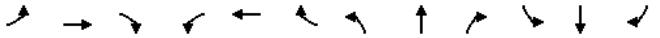
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	50	161	74
Volume Left	32	22	0
Volume Right	18	0	15
cSH	786	1471	1700
Volume to Capacity	0.06	0.01	0.04
Queue Length 95th (m)	1.6	0.4	0.0
Control Delay (s)	9.9	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.9	1.1	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		2.4		
Intersection Capacity Utilization		26.6%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	21	10	10	21	10	14	60	9	28	52	24
Future Volume (vph)	10	21	10	10	21	10	14	60	9	28	52	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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												
Frt		0.967			0.967			0.985			0.969	
Flt Protected		0.988			0.988			0.992			0.987	
Satd. Flow (prot)	0	1591	0	0	1583	0	0	1626	0	0	1569	0
Flt Permitted		0.988			0.988			0.992			0.987	
Satd. Flow (perm)	0	1591	0	0	1583	0	0	1626	0	0	1569	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		58.7			121.9			115.4			90.8	
Travel Time (s)		4.2			8.8			8.3			6.5	
Confl. Peds. (#/hr)	11		15	15		11	10		4	4		10
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%	11%	0%	0%	13%	8%	2%	0%	4%	4%	5%
Adj. Flow (vph)	11	23	11	11	23	11	15	65	10	30	57	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	45	0	0	45	0	0	90	0	0	113	0
Sign Control		Stop			Stop			Stop			Stop	

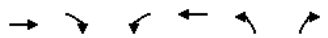
Intersection Summary				
Area Type:	CBD			
Control Type: Unsignalized				
Intersection Capacity Utilization 25.5%			ICU Level of Service A	
Analysis Period (min) 15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	21	10	10	21	10	14	60	9	28	52	24
Future Volume (vph)	10	21	10	10	21	10	14	60	9	28	52	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	23	11	11	23	11	15	65	10	30	57	26

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	45	45	90	113
Volume Left (vph)	11	11	15	30
Volume Right (vph)	11	11	10	26
Hadj (s)	-0.05	-0.04	0.01	-0.01
Departure Headway (s)	4.3	4.4	4.2	4.2
Degree Utilization, x	0.05	0.05	0.11	0.13
Capacity (veh/h)	786	775	820	837
Control Delay (s)	7.6	7.6	7.7	7.8
Approach Delay (s)	7.6	7.6	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.7	
Level of Service			A	
Intersection Capacity Utilization			25.5%	ICU Level of Service
Analysis Period (min)			15	



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	435	35	0	302	0	174
Future Volume (vph)	435	35	0	302	0	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	1810	1429	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1810	1429	0	1863	0	1611
Link Speed (k/h)	50			50	50	
Link Distance (m)	135.1			145.3	147.5	
Travel Time (s)	9.7			10.5	10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	13%	2%	2%	2%	2%
Adj. Flow (vph)	473	38	0	328	0	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	473	38	0	328	0	189
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.3%		ICU Level of Service A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	435	35	0	302	0	174
Future Volume (Veh/h)	435	35	0	302	0	174
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	473	38	0	328	0	189
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				145		
pX, platoon unblocked					0.91	
vC, conflicting volume			473		801	473
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			473		731	473
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	68
cM capacity (veh/h)			1089		353	591

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	473	38	328	189
Volume Left	0	0	0	0
Volume Right	0	38	0	189
cSH	1700	1700	1700	591
Volume to Capacity	0.28	0.02	0.19	0.32
Queue Length 95th (m)	0.0	0.0	0.0	11.0
Control Delay (s)	0.0	0.0	0.0	13.9
Lane LOS				B
Approach Delay (s)	0.0		0.0	13.9
Approach LOS				B

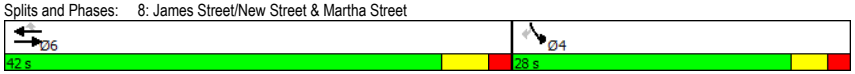
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	609	301	71	10	1
Future Volume (vph)	0	609	301	71	10	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			20.0	25.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		0.97
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1845	1810	1583	1626	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	1845	1810	1548	1626	1566
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				77		1
Link Speed (k/h)		50	50		50	
Link Distance (m)		145.3	340.2		109.6	
Travel Time (s)		10.5	24.5		7.9	
Confl. Peds. (#/hr)				2		6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	2%	11%	0%
Adj. Flow (vph)	0	662	327	77	11	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	662	327	77	11	1
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Detector Phase		6	6	6	4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0	8.0	8.0	8.0
Minimum Split (s)		42.0	42.0	42.0	28.0	28.0
Total Split (s)		42.0	42.0	42.0	28.0	28.0
Total Split (%)		60.0%	60.0%	60.0%	40.0%	40.0%
Yellow Time (s)		4.0	4.0	4.0	3.0	3.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-1.0	-1.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		Max	Max	Max	Max	Max
Act Effct Green (s)		38.0	38.0	38.0	24.0	24.0
Actuated g/C Ratio		0.54	0.54	0.54	0.34	0.34
v/c Ratio		0.66	0.33	0.09	0.02	0.00
Control Delay		15.5	10.1	2.4	15.5	12.0
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		15.5	10.1	2.4	15.5	12.0
LOS		B	B	A	B	B
Approach Delay		15.5	8.7		15.2	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach LOS		B	A		B	
Queue Length 50th (m)		59.8	23.1	0.0	1.0	0.0
Queue Length 95th (m)		95.1	38.4	5.3	4.1	1.0
Internal Link Dist (m)		121.3	316.2		85.6	
Turn Bay Length (m)				20.0	25.0	
Base Capacity (vph)		1001	982	875	557	537
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.66	0.33	0.09	0.02	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 12.9		Intersection LOS: B	
Intersection Capacity Utilization 55.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 8: James Street/New Street & Martha Street



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	609	301	71	10	1
Future Volume (vph)	0	609	301	71	10	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1845	1810	1548	1626	1566
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1845	1810	1548	1626	1566
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	662	327	77	11	1
RTOR Reduction (vph)	0	0	0	35	0	1
Lane Group Flow (vph)	0	662	327	42	11	0
Confl. Peds. (#/hr)				2		6
Heavy Vehicles (%)	0%	3%	5%	2%	11%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Actuated Green, G (s)		36.0	36.0	36.0	23.0	23.0
Effective Green, g (s)		38.0	38.0	38.0	24.0	24.0
Actuated g/C Ratio		0.54	0.54	0.54	0.34	0.34
Clearance Time (s)		6.0	6.0	6.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1001	982	840	557	536
v/s Ratio Prot		c0.36	0.18		c0.01	
v/s Ratio Perm				0.03		0.00
v/c Ratio		0.66	0.33	0.05	0.02	0.00
Uniform Delay, d1		11.4	8.9	7.5	15.2	15.1
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.4	0.9	0.1	0.1	0.0
Delay (s)		14.8	9.8	7.6	15.3	15.1
Level of Service		B	A	A	B	B
Approach Delay (s)		14.8	9.4		15.3	
Approach LOS		B	A		B	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	5	149	8	2	31
Future Volume (vph)	25	5	149	8	2	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.979		0.993			
Flt Protected	0.960					0.997
Satd. Flow (prot)	1751	0	1850	0	0	1857
Flt Permitted	0.960					0.997
Satd. Flow (perm)	1751	0	1850	0	0	1857
Link Speed (k/h)	50		50			50
Link Distance (m)	210.4		58.9			147.5
Travel Time (s)	15.1		4.2			10.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	5	162	9	2	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	171	0	0	36
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	5	149	8	2	31
Future Volume (Veh/h)	25	5	149	8	2	31
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)	27	5	162	9	2	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	204	166			171	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	204	166			171	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	783	878			1406	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	171	36
Volume Left	27	0	2
Volume Right	5	9	0
cSH	796	1700	1406
Volume to Capacity	0.04	0.10	0.00
Queue Length 95th (m)	1.0	0.0	0.0
Control Delay (s)	9.7	0.0	0.4
Lane LOS	A		A
Approach Delay (s)	9.7	0.0	0.4
Approach LOS	A		

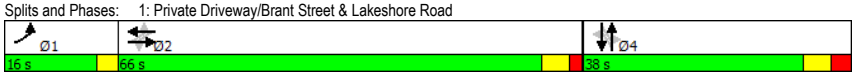
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	824	15	2	1188	156	5	8	0	192	6	376
Future Volume (vph)	223	824	15	2	1188	156	5	8	0	192	6	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	25.0		0.0	0.0		0.0	0.0		15.0
Storage Lanes	1		0	1		0	0		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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			1.00		0.99	0.95	
Frt		0.997			0.983						0.853	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1608	1652	0	1624	3075	0	0	1679	0	1518	1364	0
Flt Permitted	0.078			0.072				0.669		0.748		
Satd. Flow (perm)	132	1652	0	123	3075	0	0	1139	0	1186	1364	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			18						221	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			146.1			72.5			121.7	
Travel Time (s)		11.4			10.5			5.2			8.8	
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
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 (%)	1%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Adj. Flow (vph)	242	896	16	2	1291	170	5	9	0	209	7	409
Shared Lane Traffic (%)												
Lane Group Flow (vph)	242	912	0	2	1461	0	0	14	0	209	416	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Detector Phase	1	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.0	33.0		33.0	33.0		38.0	38.0		38.0	38.0	
Total Split (s)	16.0	66.0		66.0	66.0		38.0	38.0		38.0	38.0	
Total Split (%)	13.3%	55.0%		55.0%	55.0%		31.7%	31.7%		31.7%	31.7%	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	76.3	62.2		62.2	62.2			27.1		27.1	27.1	
Actuated g/C Ratio	0.67	0.55		0.55	0.55			0.24		0.24	0.24	
v/c Ratio	0.94	1.01		0.03	0.86			0.05		0.74	0.84	
Control Delay	71.4	58.7		15.5	29.4			32.4		55.7	34.9	
Queue Delay	0.0	0.0		0.0	42.8			0.0		0.0	0.0	
Total Delay	71.4	58.7		15.5	72.1			32.4		55.7	34.9	
LOS	E	E		B	E			C		E	C	
Approach Delay		61.4			72.1			32.4			41.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			E			C			D	
Queue Length 50th (m)	38.4	~215.5		0.2	147.8			2.5		45.1	45.6	
Queue Length 95th (m)	#97.1	#331.3		1.8	#223.2			8.0		73.0	89.0	
Internal Link Dist (m)		134.0			122.1			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	258	906		67	1695			342		356	564	
Starvation Cap Reductn	0	0		0	354			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	0.94	1.01		0.03	1.09			0.04		0.59	0.74	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 113.4			
Natural Cycle: 120			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 62.3		Intersection LOS: E	
Intersection Capacity Utilization 95.0%		ICU Level of Service F	
Analysis Period (min) 15			
~ 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.			

Splits and Phases: 1: Private Driveway/Brant Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	824	15	2	1188	156	5	8	0	192	6	376
Future Volume (vph)	223	824	15	2	1188	156	5	8	0	192	6	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		0.99	1.00	
Frt	1.00	1.00		1.00	0.98			1.00		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1608	1653		1624	3075			1673		1507	1366	
Flt Permitted	0.08	1.00		0.07	1.00			0.67		0.75	1.00	
Satd. Flow (perm)	132	1653		123	3075			1139		1187	1366	
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)	242	896	16	2	1291	170	5	9	0	209	7	409
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	168	0
Lane Group Flow (vph)	242	912	0	2	1453	0	0	14	0	209	248	0
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
Heavy Vehicles (%)	1%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Actuated Green, G (s)	73.2	60.2		60.2	60.2			24.1		24.1	24.1	
Effective Green, g (s)	73.2	62.2		62.2	62.2			27.1		27.1	27.1	
Actuated g/C Ratio	0.65	0.55		0.55	0.55			0.24		0.24	0.24	
Clearance Time (s)	3.0	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)	254	907		67	1688			272		283	326	
v/s Ratio Prot	c0.11	c0.55			0.47						c0.18	
v/s Ratio Perm	0.50			0.02				0.01		0.18		
v/c Ratio	0.95	1.01		0.03	0.86			0.05		0.74	0.76	
Uniform Delay, d1	32.5	25.5		11.7	21.8			33.2		39.8	40.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	43.3	31.1		0.8	6.0			0.1		9.7	10.0	
Delay (s)	75.8	56.7		12.5	27.9			33.3		49.5	50.1	
Level of Service	E	E		B	C			C		D	D	
Approach Delay (s)		60.7			27.8			33.3			49.9	
Approach LOS		E			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	43.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	113.3	Sum of lost time (s)	11.0
Intersection Capacity Utilization	95.0%	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)	47	866	44	39	1150	28	39	33	31	43	0	81
Future Volume (vph)	47	866	44	39	1150	28	39	33	31	43	0	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	25.0		0.0	0.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			0.99		0.99	0.98	
Frt		0.993			0.996			0.959			0.850	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1450	1678	0	1083	3169	0	0	1421	0	1504	1291	0
Flt Permitted	0.189			0.211				0.849		0.603		
Satd. Flow (perm)	288	1678	0	241	3169	0	0	1224	0	950	1291	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			5			17			98	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		146.1			118.3			58.9			56.3	
Travel Time (s)		10.5			8.5			4.2			4.1	
Confl. Peds. (#/hr)	4		18	18		4	8		3	3		8
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 (%)	12%	1%	0%	50%	2%	4%	33%	0%	0%	8%	0%	10%
Adj. Flow (vph)	51	941	48	42	1250	30	42	36	34	47	0	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	989	0	42	1280	0	0	112	0	47	88	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		33.0	33.0		33.0	33.0	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Yellow Time (s)	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	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	85.7	85.7		85.7	85.7			16.9		16.9	16.9	
Actuated g/C Ratio	0.77	0.77		0.77	0.77			0.15		0.15	0.15	
v/c Ratio	0.23	0.76		0.23	0.52			0.56		0.33	0.31	
Control Delay	7.4	12.8		7.9	6.1			46.5		46.2	9.4	
Queue Delay	0.0	9.1		0.0	1.8			0.0		0.0	0.0	
Total Delay	7.4	21.9		7.9	7.8			46.5		46.2	9.4	
LOS	A	C		A	A			D		D	A	
Approach Delay		21.2			7.8			46.5			22.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A			D			C	
Queue Length 50th (m)	2.6	98.5		2.1	46.3			19.5		9.3	0.0	
Queue Length 95th (m)	9.5	209.3		8.6	80.2			37.9		20.9	11.7	
Internal Link Dist (m)		122.1			94.3			34.9			32.3	
Turn Bay Length (m)				25.0						20.0		
Base Capacity (vph)	223	1301		186	2457			333		249	411	
Starvation Cap Reductn	0	285		0	954			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	0.23	0.97		0.23	0.85			0.34		0.19	0.21	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 110.6			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 74.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Lakeshore Road & Elizabeth Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	866	44	39	1150	28	39	33	31	43	0	81
Future Volume (vph)	47	866	44	39	1150	28	39	33	31	43	0	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00			0.96		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1449	1678		1078	3171			1416		1497	1292	
Flt Permitted	0.19	1.00		0.21	1.00			0.85		0.60	1.00	
Satd. Flow (perm)	288	1678		239	3171			1226		949	1292	
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)	51	941	48	42	1250	30	42	36	34	47	0	88
RTOR Reduction (vph)	0	1	0	0	1	0	0	14	0	0	75	0
Lane Group Flow (vph)	51	988	0	42	1279	0	0	98	0	47	13	0
Confl. Peds. (#/hr)	4		18	18		4	8		3	3		8
Heavy Vehicles (%)	12%	1%	0%	50%	2%	4%	33%	0%	0%	8%	0%	10%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	82.7	82.7		82.7	82.7			13.9		13.9	13.9	
Effective Green, g (s)	85.7	85.7		85.7	85.7			16.9		16.9	16.9	
Actuated g/C Ratio	0.77	0.77		0.77	0.77			0.15		0.15	0.15	
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)	223	1300		185	2457			187		145	197	
v/s Ratio Prot		c0.59			0.40						0.01	
v/s Ratio Perm	0.18			0.18				c0.08		0.05		
v/c Ratio	0.23	0.76		0.23	0.52			0.52		0.32	0.07	
Uniform Delay, d1	3.4	6.8		3.4	4.7			43.1		41.8	40.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.4	4.2		2.8	0.8			2.6		1.3	0.1	
Delay (s)	5.8	11.0		6.2	5.5			45.7		43.1	40.3	
Level of Service	A	B		A	A			D		D	D	
Approach Delay (s)		10.8			5.5			45.7			41.2	
Approach LOS		B			A			D			D	

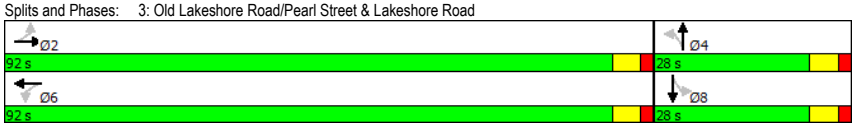
Intersection Summary					
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.72				
Actuated Cycle Length (s)	110.6	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	74.4%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

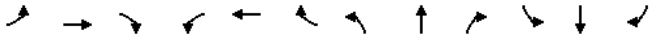
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	887	10	5	1125	57	35	10	1	35	4	58
Future Volume (vph)	44	887	10	5	1125	57	35	10	1	35	4	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	20.0		0.0	0.0		0.0	7.0		0.0
Storage Lanes	1		0	1		0	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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			1.00		1.00	0.99	
Frt		0.998			0.993			0.997			0.859	
Flt Protected	0.950			0.950				0.963		0.950		
Satd. Flow (prot)	1624	1673	0	1624	3154	0	0	1641	0	1464	1448	0
Flt Permitted	0.199			0.249				0.734		0.776		
Satd. Flow (perm)	339	1673	0	426	3154	0	0	1248	0	1190	1448	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			11			1			63	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		118.3			120.7			53.5			115.4	
Travel Time (s)		8.5			8.7			3.9			8.3	
Confl. Peds. (#/hr)	20		3	3		20	2		2	2		2
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%	2%	0%	0%	2%	2%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	48	964	11	5	1223	62	38	11	1	38	4	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	975	0	5	1285	0	0	50	0	38	67	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	37.0	37.0		37.0	37.0		28.0	28.0		28.0	28.0	
Total Split (s)	92.0	92.0		92.0	92.0		28.0	28.0		28.0	28.0	
Total Split (%)	76.7%	76.7%		76.7%	76.7%		23.3%	23.3%		23.3%	23.3%	
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	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		Max	Max		None	None		None	None	
Act Effct Green (s)	91.9	91.9		91.9	91.9			11.9		11.9	11.9	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.11		0.11	0.11	
v/c Ratio	0.17	0.69		0.01	0.48			0.36		0.29	0.31	
Control Delay	4.0	7.5		2.4	3.6			51.3		49.9	16.3	
Queue Delay	0.0	4.7		0.0	0.0			0.0		0.0	0.0	
Total Delay	4.0	12.3		2.4	3.6			51.3		49.9	16.3	
LOS	A	B		A	A			D		D	B	
Approach Delay		11.9			3.6			51.3			28.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A			D			C	
Queue Length 50th (m)	1.7	69.4		0.1	33.4			10.2		7.9	0.8	
Queue Length 95th (m)	5.7	140.2		1.0	55.3			22.5		18.5	13.9	
Internal Link Dist (m)		94.3			96.7			29.5			91.4	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	288	1421		361	2680			277		264	370	
Starvation Cap Reductn	0	369		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	0.17	0.93		0.01	0.48			0.18		0.14	0.18	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 108.2			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 9.0		Intersection LOS: A	
Intersection Capacity Utilization 69.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Old Lakeshore Road/Pearl Street & Lakeshore Road

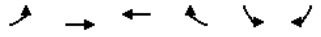




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	887	10	5	1125	57	35	10	1	35	4	58
Future Volume (vph)	44	887	10	5	1125	57	35	10	1	35	4	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1616	1674		1623	3154			1639		1457	1448	
Flt Permitted	0.20	1.00		0.25	1.00			0.73		0.78	1.00	
Satd. Flow (perm)	338	1674		425	3154			1248		1190	1448	
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)	48	964	11	5	1223	62	38	11	1	38	4	63
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	57	0
Lane Group Flow (vph)	48	975	0	5	1283	0	0	49	0	38	10	0
Confl. Peds. (#/hr)	20		3	3		20	2		2	2		2
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	0%	0%	11%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	89.1	89.1		89.1	89.1			8.3		8.3	8.3	
Effective Green, g (s)	91.1	91.1		91.1	91.1			10.3		10.3	10.3	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.09		0.09	0.09	
Clearance Time (s)	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	
Lane Grp Cap (vph)	281	1393		353	2626			117		112	136	
v/s Ratio Prot		c0.58			0.41						0.01	
v/s Ratio Perm	0.14			0.01				c0.04		0.03		
v/c Ratio	0.17	0.70		0.01	0.49			0.42		0.34	0.07	
Uniform Delay, d1	1.8	3.7		1.5	2.6			46.7		46.4	45.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.6		0.1	0.7			2.4		1.8	0.2	
Delay (s)	2.1	5.2		1.6	3.2			49.2		48.2	45.4	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		5.1			3.2			49.2			46.4	
Approach LOS		A			A			D			D	

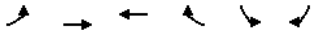
Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	792	1139	61	26	35
Future Volume (vph)	101	792	1139	61	26	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.993		0.922	
Flt Protected	0.950				0.979	
Satd. Flow (prot)	1624	1693	1675	0	1484	0
Flt Permitted	0.950				0.979	
Satd. Flow (perm)	1624	1693	1675	0	1484	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	127.1		115.7	
Travel Time (s)		8.7	9.2		8.3	
Confl. Peds. (#/hr)	12			12		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	1%	8%	0%	7%
Adj. Flow (vph)	110	861	1238	66	28	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	110	861	1304	0	66	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	792	1139	61	26	35
Future Volume (Veh/h)	101	792	1139	61	26	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	861	1238	66	28	38
Pedestrians		1			12	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.2			1.2	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (m)		121				
pX, platoon unblocked					0.77	
vC, conflicting volume	1316				2364	1284
vC1, stage 1 conf vol					1283	
vC2, stage 2 conf vol					1081	
vCu, unblocked vol	1316				2628	1284
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.4
p0 queue free %	79				83	80
cM capacity (veh/h)	527				163	194

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	110	861	1304	66
Volume Left	110	0	0	28
Volume Right	0	0	66	38
cSH	527	1700	1700	180
Volume to Capacity	0.21	0.51	0.77	0.37
Queue Length 95th (m)	6.2	0.0	0.0	12.5
Control Delay (s)	13.6	0.0	0.0	36.2
Lane LOS	B			E
Approach Delay (s)	1.5		0.0	36.2
Approach LOS				E

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	43	30	24	134	37	10
Future Volume (vph)	43	30	24	134	37	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.944				0.971	
Flt Protected	0.971			0.992		
Satd. Flow (prot)	1567	0	0	1696	1660	0
Flt Permitted	0.971			0.992		
Satd. Flow (perm)	1567	0	0	1696	1660	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	121.9			115.7	59.2	
Travel Time (s)	8.8			8.3	4.3	
Confl. Peds. (#/hr)		1	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	47	33	26	146	40	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	0	0	172	51	0
Sign Control	Stop			Free	Free	

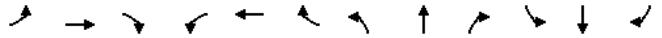
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	30	24	134	37	10
Future Volume (Veh/h)	43	30	24	134	37	10
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)	47	33	26	146	40	11
Pedestrians	5			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	248	52	56			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	248	52	56			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	98			
cM capacity (veh/h)	729	1017	1555			

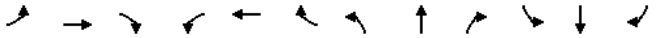
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	80	172	51
Volume Left	47	26	0
Volume Right	33	0	11
cSH	825	1555	1700
Volume to Capacity	0.10	0.02	0.03
Queue Length 95th (m)	2.6	0.4	0.0
Control Delay (s)	9.8	1.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	1.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		3.3	
Intersection Capacity Utilization		27.7%	ICU Level of Service A
Analysis Period (min)		15	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	30	12	10	24	16	30	61	12	35	101	35
Future Volume (vph)	18	30	12	10	24	16	30	61	12	35	101	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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												
Frt		0.973			0.957			0.984			0.972	
Flt Protected		0.985			0.990			0.985			0.990	
Satd. Flow (prot)	0	1639	0	0	1620	0	0	1657	0	0	1645	0
Flt Permitted		0.985			0.990			0.985			0.990	
Satd. Flow (perm)	0	1639	0	0	1620	0	0	1657	0	0	1645	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		58.7			121.9			115.4			90.8	
Travel Time (s)		4.2			8.8			8.3			6.5	
Confl. Peds. (#/hr)	13		18	18		13	10		4	4		10
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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	20	33	13	11	26	17	33	66	13	38	110	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	66	0	0	54	0	0	112	0	0	186	0
Sign Control		Stop			Stop			Stop			Stop	

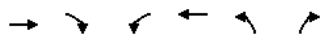
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.9%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	30	12	10	24	16	30	61	12	35	101	35
Future Volume (vph)	18	30	12	10	24	16	30	61	12	35	101	35
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	33	13	11	26	17	33	66	13	38	110	38

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	66	54	112	186
Volume Left (vph)	20	11	33	38
Volume Right (vph)	13	17	13	38
Hadj (s)	-0.06	-0.15	-0.01	-0.08
Departure Headway (s)	4.6	4.5	4.4	4.2
Degree Utilization, x	0.08	0.07	0.14	0.22
Capacity (veh/h)	726	737	788	815
Control Delay (s)	8.0	7.8	8.1	8.4
Approach Delay (s)	8.0	7.8	8.1	8.4
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.2	
Level of Service			A	
Intersection Capacity Utilization			28.9%	ICU Level of Service
Analysis Period (min)			15	



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	362	38	0	827	0	140
Future Volume (vph)	362	38	0	827	0	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	1863	1538	0	1900	0	1644
Flt Permitted						
Satd. Flow (perm)	1863	1538	0	1900	0	1644
Link Speed (k/h)	50			50	50	
Link Distance (m)	110.3			205.0	191.5	
Travel Time (s)	7.9			14.8	13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	5%	0%	0%	0%	0%
Adj. Flow (vph)	393	41	0	899	0	152
Shared Lane Traffic (%)						
Lane Group Flow (vph)	393	41	0	899	0	152
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	362	38	0	827	0	140
Future Volume (Veh/h)	362	38	0	827	0	140
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	393	41	0	899	0	152
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				205		
pX, platoon unblocked					0.82	
vC, conflicting volume			393		1292	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			393		1246	393
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	77
cM capacity (veh/h)			1177		158	660

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	393	41	899	152
Volume Left	0	0	0	0
Volume Right	0	41	0	152
cSH	1700	1700	1700	660
Volume to Capacity	0.23	0.02	0.53	0.23
Queue Length 95th (m)	0.0	0.0	0.0	7.1
Control Delay (s)	0.0	0.0	0.0	12.1
Lane LOS				B
Approach Delay (s)	0.0		0.0	12.1
Approach LOS				B

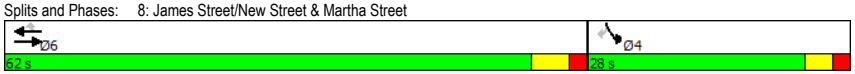
Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	502	826	99	8	1
Future Volume (vph)	0	502	826	99	8	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			20.0	25.0	0.0
Storage Lanes	0			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1881	1599	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1881	1563	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				47		1
Link Speed (k/h)		50	50		50	
Link Distance (m)		205.0	135.0		164.4	
Travel Time (s)		14.8	9.7		11.8	
Confl. Peds. (#/hr)				2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	1%	1%	0%	0%
Adj. Flow (vph)	0	546	898	108	9	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	546	898	108	9	1
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Detector Phase		6	6	6	4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0	8.0	8.0	8.0
Minimum Split (s)		42.0	42.0	42.0	28.0	28.0
Total Split (s)		62.0	62.0	62.0	28.0	28.0
Total Split (%)		68.9%	68.9%	68.9%	31.1%	31.1%
Yellow Time (s)		4.0	4.0	4.0	3.0	3.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-1.0	-1.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		Max	Max	Max	None	None
Act Effct Green (s)		76.6	76.6	76.6	9.0	9.0
Actuated g/C Ratio		0.96	0.96	0.96	0.11	0.11
v/c Ratio		0.30	0.50	0.07	0.04	0.01
Control Delay		1.2	2.0	0.6	34.4	28.0
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		1.2	2.0	0.6	34.4	28.0
LOS		A	A	A	C	C
Approach Delay		1.2	1.9		33.7	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach LOS		A	A		C	
Queue Length 50th (m)		0.0	0.0	0.0	1.3	0.0
Queue Length 95th (m)		28.2	63.3	4.0	6.1	1.5
Internal Link Dist (m)		181.0	111.0		140.4	
Turn Bay Length (m)				20.0	25.0	
Base Capacity (vph)		1793	1810	1506	546	489
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.30	0.50	0.07	0.02	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 79.6			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.50			
Intersection Signal Delay: 1.8		Intersection LOS: A	
Intersection Capacity Utilization 56.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 8: James Street/New Street & Martha Street



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	502	826	99	8	1
Future Volume (vph)	0	502	826	99	8	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1863	1881	1563	1805	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1863	1881	1563	1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	546	898	108	9	1
RTOR Reduction (vph)	0	0	0	6	0	1
Lane Group Flow (vph)	0	546	898	102	9	0
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	2%	1%	1%	0%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		6	6		4	
Permitted Phases				6		4
Actuated Green, G (s)		71.3	71.3	71.3	1.4	1.4
Effective Green, g (s)		73.3	73.3	73.3	2.4	2.4
Actuated g/C Ratio		0.88	0.88	0.88	0.03	0.03
Clearance Time (s)		6.0	6.0	6.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1631	1647	1368	51	46
v/s Ratio Prot		0.29	c0.48		c0.00	
v/s Ratio Perm				0.07		0.00
v/c Ratio		0.33	0.55	0.07	0.18	0.00
Uniform Delay, d1		0.9	1.2	0.7	39.7	39.5
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.6	1.3	0.1	1.7	0.0
Delay (s)		1.5	2.5	0.8	41.3	39.5
Level of Service		A	A	A	D	D
Approach Delay (s)		1.5	2.4		41.2	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	2.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	83.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	14	3	157	20	6	18
Future Volume (vph)	14	3	157	20	6	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.977		0.985			
Flt Protected	0.960					0.987
Satd. Flow (prot)	1747	0	1835	0	0	1839
Flt Permitted	0.960					0.987
Satd. Flow (perm)	1747	0	1835	0	0	1839
Link Speed (k/h)	50		50			50
Link Distance (m)	205.3		59.2			191.5
Travel Time (s)	14.8		4.3			13.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	3	171	22	7	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	193	0	0	27
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	3	157	20	6	18
Future Volume (Veh/h)	14	3	157	20	6	18
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)	15	3	171	22	7	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	216	182			193	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216	182			193	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			99	
cM capacity (veh/h)	768	861			1380	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	18	193	27
Volume Left	15	0	7
Volume Right	3	22	0
cSH	782	1700	1380
Volume to Capacity	0.02	0.11	0.01
Queue Length 95th (m)	0.6	0.0	0.1
Control Delay (s)	9.7	0.0	2.0
Lane LOS	A		A
Approach Delay (s)	9.7	0.0	2.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix H

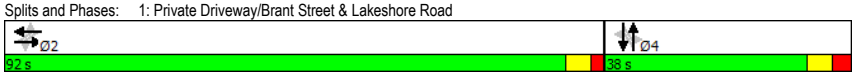
Sensitivity Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	1055	8	1	762	170	5	3	1	138	1	202
Future Volume (vph)	230	1055	8	1	762	170	5	3	1	138	1	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	25.0		0.0	0.0		0.0	0.0		15.0
Storage Lanes	1		0	1		0	0		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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99			1.00		0.99	0.99	
Frt		0.999			0.973			0.985			0.851	
Flt Protected	0.950			0.950				0.973		0.950		
Satd. Flow (prot)	1547	1643	0	812	2984	0	0	1402	0	1608	1381	0
Flt Permitted	0.254			0.112				0.848		0.752		
Satd. Flow (perm)	411	1643	0	96	2984	0	0	1221	0	1264	1381	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			46			1			210	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		304.4			146.1			72.5			121.7	
Travel Time (s)		21.9			10.5			5.2			8.8	
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
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 (%)	5%	4%	0%	100%	5%	5%	0%	50%	0%	1%	0%	4%
Adj. Flow (vph)	250	1147	9	1	828	185	5	3	1	150	1	220
Shared Lane Traffic (%)												
Lane Group Flow (vph)	250	1156	0	1	1013	0	0	9	0	150	221	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2	2		2			4			4		
Detector Phase	2	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		38.0	38.0		38.0	38.0	
Total Split (s)	92.0	92.0		92.0	92.0		38.0	38.0		38.0	38.0	
Total Split (%)	70.8%	70.8%		70.8%	70.8%		29.2%	29.2%		29.2%	29.2%	
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		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	6.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	86.2	88.2		88.2	88.2			22.2		22.2	22.2	
Actuated g/C Ratio	0.73	0.74		0.74	0.74			0.19		0.19	0.19	
v/c Ratio	0.84	0.94		0.01	0.45			0.04		0.64	0.52	
Control Delay	40.1	31.1		6.0	6.9			36.1		56.6	10.8	
Queue Delay	0.0	0.0		0.0	0.7			0.0		0.0	0.0	
Total Delay	40.1	31.1		6.0	7.6			36.1		56.6	10.8	
LOS	D	C		A	A			D		E	B	
Approach Delay		32.7			7.6			36.1			29.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A			D			C	
Queue Length 50th (m)	37.1	208.9		0.1	40.8			1.6		34.1	2.2	
Queue Length 95th (m)	#115.4	#407.7		0.8	70.9			6.4		56.6	23.9	
Internal Link Dist (m)		280.4			122.1			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	299	1224		71	2235			352		363	547	
Starvation Cap Reductn	0	0		0	813			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	0.84	0.94		0.01	0.71			0.03		0.41	0.40	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 130			
Actuated Cycle Length: 118.4			
Natural Cycle: 130			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 23.2		Intersection LOS: C	
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Private Driveway/Brant Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	1055	8	1	762	170	5	3	1	138	1	202
Future Volume (vph)	230	1055	8	1	762	170	5	3	1	138	1	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		0.99	1.00	
Frt	1.00	1.00		1.00	0.97			0.98		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1539	1642		812	2984			1401		1597	1381	
Flt Permitted	0.25	1.00		0.11	1.00			0.85		0.75	1.00	
Satd. Flow (perm)	412	1642		96	2984			1221		1264	1381	
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)	250	1147	9	1	828	185	5	3	1	150	1	220
RTOR Reduction (vph)	0	0	0	0	12	0	0	1	0	0	171	0
Lane Group Flow (vph)	250	1156	0	1	1001	0	0	8	0	150	50	0
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
Heavy Vehicles (%)	5%	4%	0%	100%	5%	5%	0%	50%	0%	1%	0%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2	2		2			4			4		
Actuated Green, G (s)	86.2	86.2		86.2	86.2			19.2		19.2	19.2	
Effective Green, g (s)	86.2	88.2		88.2	88.2			22.2		22.2	22.2	
Actuated g/C Ratio	0.73	0.74		0.74	0.74			0.19		0.19	0.19	
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)	299	1223		71	2222			228		237	258	
v/s Ratio Prot		c0.70			0.34						0.04	
v/s Ratio Perm	0.61			0.01				0.01		c0.12		
v/c Ratio	0.84	0.95		0.01	0.45			0.04		0.63	0.20	
Uniform Delay, d1	11.2	13.0		3.9	5.8			39.3		44.3	40.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	23.3	15.5		0.4	0.7			0.1		5.4	0.4	
Delay (s)	34.5	28.5		4.3	6.5			39.4		49.8	40.9	
Level of Service	C	C		A	A			D		D	D	
Approach Delay (s)		29.6			6.5			39.4			44.5	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

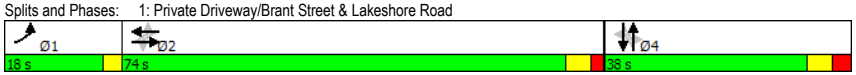
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	824	15	2	1188	156	5	8	0	192	6	376
Future Volume (vph)	223	824	15	2	1188	156	5	8	0	192	6	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	25.0		0.0	0.0		0.0	0.0		15.0
Storage Lanes	1		0	1		0	0		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	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			1.00		0.99	0.95	
Frt		0.997			0.983						0.853	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1608	1652	0	1624	3073	0	0	1679	0	1518	1360	0
Flt Permitted	0.084			0.086				0.616		0.748		
Satd. Flow (perm)	142	1652	0	147	3073	0	0	1048	0	1185	1360	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			17						228	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			146.1			72.5			121.7	
Travel Time (s)		11.4			10.5			5.2			8.8	
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
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 (%)	1%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Adj. Flow (vph)	242	896	16	2	1291	170	5	9	0	209	7	409
Shared Lane Traffic (%)												
Lane Group Flow (vph)	242	912	0	2	1461	0	0	14	0	209	416	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Detector Phase	1	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.0	33.0		33.0	33.0		38.0	38.0		38.0	38.0	
Total Split (s)	18.0	74.0		74.0	74.0		38.0	38.0		38.0	38.0	
Total Split (%)	13.8%	56.9%		56.9%	56.9%		29.2%	29.2%		29.2%	29.2%	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		-2.0	-2.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Max		Max	Max		None	None		None	None	
Act Effct Green (s)	86.1	70.1		70.1	70.1			28.3		28.3	28.3	
Actuated g/C Ratio	0.69	0.56		0.56	0.56			0.23		0.23	0.23	
v/c Ratio	0.88	0.98		0.02	0.84			0.06		0.78	0.86	
Control Delay	59.8	52.8		15.0	28.8			37.2		65.1	38.2	
Queue Delay	0.0	0.0		0.0	47.5			0.0		0.0	0.0	
Total Delay	59.8	52.8		15.0	76.3			37.2		65.1	38.2	
LOS	E	D		B	E			D		E	D	
Approach Delay		54.3			76.2			37.2			47.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			E			D			D	
Queue Length 50th (m)	40.2	227.0		0.2	161.4			2.8		50.8	49.9	
Queue Length 95th (m)	#94.5	#343.6		1.7	211.8			8.5		80.7	#103.8	
Internal Link Dist (m)		134.0			122.1			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	275	931		82	1740			287		324	538	
Starvation Cap Reductn	0	0		0	418			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	0.88	0.98		0.02	1.11			0.05		0.65	0.77	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 130			
Actuated Cycle Length: 124.4			
Natural Cycle: 120			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 62.7		Intersection LOS: E	
Intersection Capacity Utilization 95.0%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Private Driveway/Brant Street & Lakeshore Road



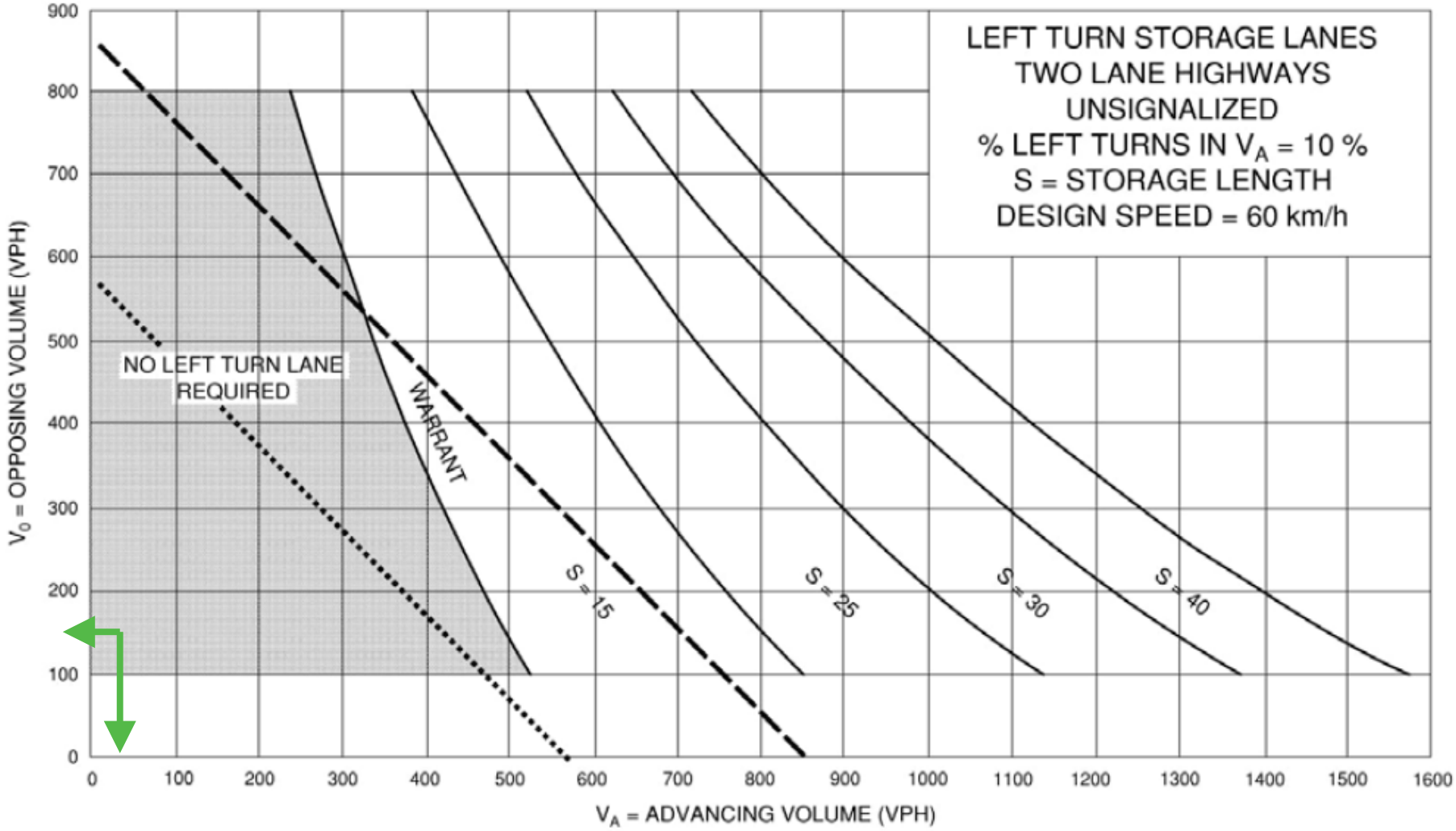
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	824	15	2	1188	156	5	8	0	192	6	376
Future Volume (vph)	223	824	15	2	1188	156	5	8	0	192	6	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	0.95	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		0.99	1.00	
Frt	1.00	1.00		1.00	0.98			1.00		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1608	1653		1624	3073			1672		1506	1361	
Flt Permitted	0.08	1.00		0.09	1.00			0.62		0.75	1.00	
Satd. Flow (perm)	142	1653		147	3073			1049		1186	1361	
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)	242	896	16	2	1291	170	5	9	0	209	7	409
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	176	0
Lane Group Flow (vph)	242	912	0	2	1454	0	0	14	0	209	240	0
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
Heavy Vehicles (%)	1%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	2			2			4			4	
Permitted Phases	2	2		2			4			4		
Actuated Green, G (s)	83.2	68.2		68.2	68.2			25.3		25.3	25.3	
Effective Green, g (s)	83.2	70.2		70.2	70.2			28.3		28.3	28.3	
Actuated g/C Ratio	0.67	0.56		0.56	0.56			0.23		0.23	0.23	
Clearance Time (s)	3.0	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)	271	932		82	1732			238		269	309	
v/s Ratio Prot	c0.11	c0.55			0.47						0.18	
v/s Ratio Perm	0.49			0.01				0.01		c0.18		
v/c Ratio	0.89	0.98		0.02	0.84			0.06		0.78	0.78	
Uniform Delay, d1	33.2	26.4		12.0	22.5			37.7		45.1	45.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	28.6	24.6		0.5	5.1			0.1		13.1	11.6	
Delay (s)	61.9	51.0		12.6	27.5			37.8		58.3	56.7	
Level of Service	E	D		B	C			D		E	E	
Approach Delay (s)		53.3			27.5			37.8			57.2	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	124.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		

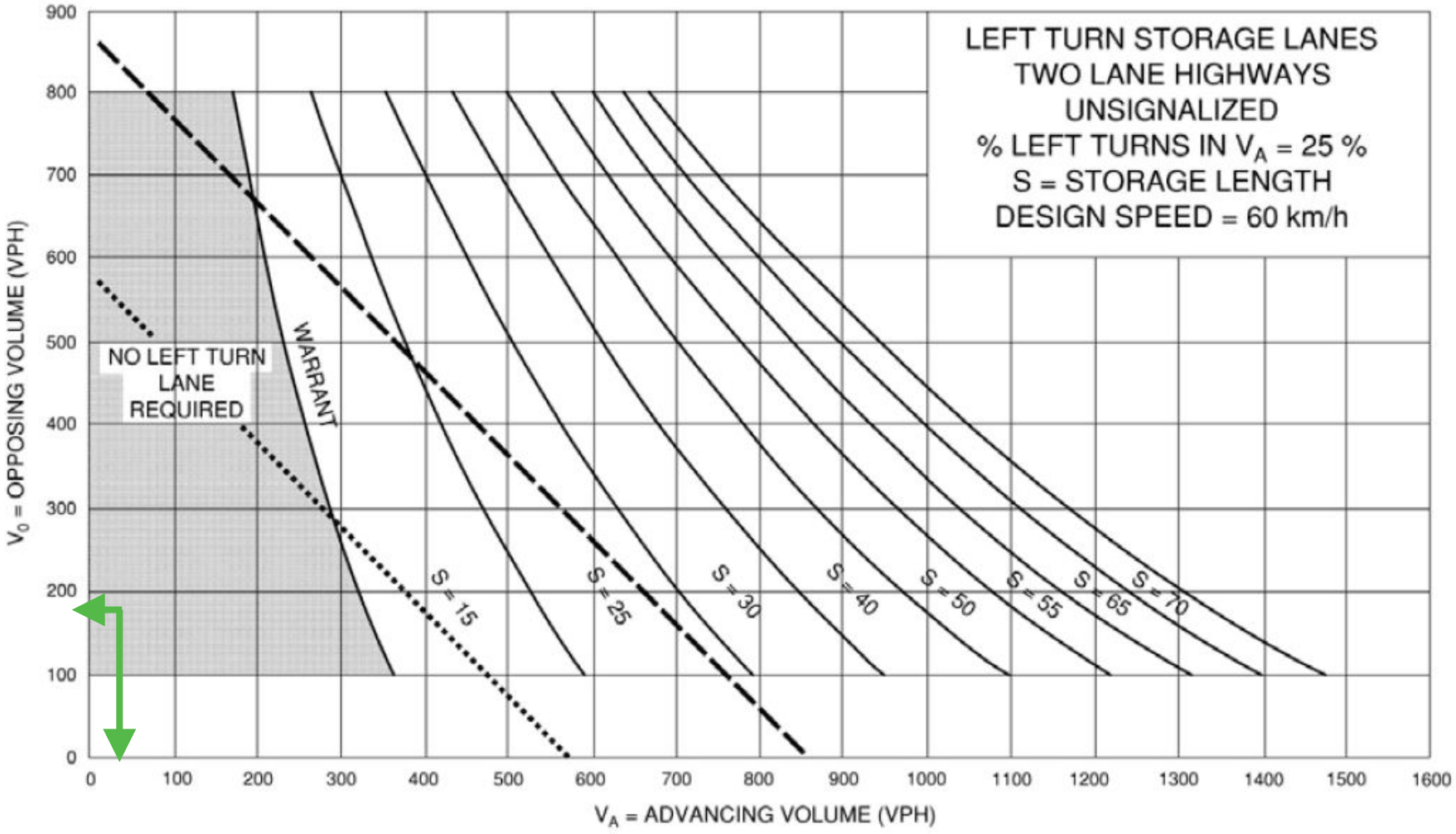
c Critical Lane Group

Appendix I

Left-Turn Lane Warrant Nomographs



Martha Street at Site Driveway
2027 Total – Southbound Left Turn Lane Warrant
AM Peak



Martha Street at Site Driveway
2026 Total – Southbound Left Turn Lane Warrant
PM Peak

Appendix J

Zoning By-Law 2020

CITY OF Burlington

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6.0 DRH ZONE REGULATIONS (DOWNTOWN HIGH DENSITY RESIDENTIAL)

6.1 Lot Width, Area, Yards, Density, Height and Amenity Area

Table 6.6.1

Regulation	Apartment Building, Retirement Home
Lot Width	30 m
Lot Area	0.1 ha
Front Yard and Street Side Yard	6 m; 7.5 m abutting a street having a deemed width of 26 m or more
Rear Yard	7.5 m
Side Yard	6 m
Yard abutting R1, R2, R3, DRL Zones	15 m
Density	50 units per hectare minimum, 185 units per hectare maximum
Height	22 m maximum
Amenity Area	20 m2 per unit
Building setback abutting a creek block	7.5 m, 4.5 m if block includes a 3 m buffer
Yard abutting a pipeline easement	7 metres rear yard; 3 metres side yard

6.2 Parking

a) Parking shall be provided in accordance with Part 1, Subsection 2.25 "Off Street Parking and Loading Requirements" except as amended by the following:

- 1.00 occupant spaces per unit
- 0.25 visitor parking spaces per unit

b) Enclosed Occupant Parking: 100% of occupant parking shall be enclosed

c) Parking Lots, Parking Spaces, Driveways

[i] Notwithstanding Part 2, Subsection 6.2, "Landscape Area and Buffer" a parking lot may be setback 1 m from a street line provided a decorative wall or fence having a height of 1m to 1.2 m screens the parking lot from the street.

[ii] Parking spaces and driveways shall be setback 3 m from a wall of a building containing windows of habitable rooms in dwellings units located on the ground floor or basement.

6.3 Landscape Area and Buffer

Landscape Area:

Abutting a street having a deemed width up to 26 m: 3 m
Abutting a street having a deemed width greater than 26 m: 4.5 m
Abutting a creek block or 03 zone: 3 m

Landscape Buffer:

Abutting R1, R2, R3, DRL Residential zones: 6 m
Abutting other Residential zones: 3 m

6.4 Outside Storage

Waste stored outside shall be kept within a solid screened enclosure.

6.5 Fencing

On lands abutting a residential, DRM or DRL zone, fencing shall be installed along the common boundary with the residential zone and shall have a minimum height of 1.8 m, which may be a solid screen fence or a combination of chain link fence and landscape planting to form a dense year-round screen.

This page last updated December 15, 2015

Contacts:

Contact Department

Numbers

Links

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Burlington, ON L7R 3Z6

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Burlington, Ontario L7R 3Z6

Customer Service Button

Appendix K

Off-Site Parking Survey Data

Time	# Stalls	9:00		9:20		9:40		10:00		10:20		10:40		11:00		11:20		11:40	
Lot 5 Brant St Lot	60	10	17%	16	27%	22	37%	29	48%	29	48%	27	45%	29	48%	37	62%	34	57%
John St west side between Pine & Lot 5	3	0	0%	2	67%	0	0%	1	33%	1	33%	0	0%	0	0%	1	33%	2	67%
John St west side between Lakeshore & Pine	5	0	0%	0	0%	1	20%	2	40%	3	60%	2	40%	4	80%	4	80%	4	80%
John St east side between Lakehsore & Pine	6	0	0%	0	0%	1	17%	3	50%	3	50%	3	50%	5	83%	4	67%	4	67%
Brant St east side between Lakeshore & Pine	2	1	50%	1	50%	0	0%	2	100%	3	150%	2	100%	3	150%	3	150%	3	150%
Brant St west side between Lakeshore & Elgin	8	7	88%	8	100%	6	75%	6	75%	8	100%	8	100%	9	113%	6	75%	10	125%
Pine St north side between Brant & John	3	2	67%	1	33%	1	33%	1	33%	1	33%	2	67%	2	67%	2	67%	1	33%
Brant St east side between Pine & Elgin/Lot 5	8	3	38%	3	38%	3	38%	6	75%	7	88%	6	75%	8	100%	8	100%	6	75%
Lakeshore Rd south side between Elizabeth & Pearl	7	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	2	29%	2	29%	2	29%
Elizabeth St west side between Pine & Lot 4	6	0	0%	3	50%	3	50%	4	67%	4	67%	3	50%	5	83%	5	83%	7	117%
Lot 4 Elizabeth St Lot	97	42	43%	46	47%	59	61%	74	76%	75	77%	73	75%	72	74%	75	77%	75	77%
Lot 1 Pearl St Lot	39	19	49%	14	36%	17	44%	22	56%	26	67%	27	69%	30	77%	31	79%	29	74%
Pearl St west side between Pine & Lot 1	8	3	38%	3	38%	3	38%	4	50%	6	75%	6	75%	4	50%	7	88%	5	63%
Pine St north side between Elizabeth & Pearl	9	9	100%	9	100%	9	100%	7	78%	8	89%	6	67%	4	44%	4	44%	8	89%
Pine St north side between Pearl & Martha	4	2	50%	3	75%	3	75%	6	150%	6	150%	6	150%	6	150%	4	100%	5	125%
Lot 4 Martha St Lot	11	0	0%	2	18%	3	27%	4	36%	4	36%	5	45%	5	45%	5	45%	5	45%
Martha St west side between Lakeshore & Pine	6	0	0%	0	0%	1	17%	4	67%	3	50%	2	33%	3	50%	2	33%	2	33%
Old Lakeshore Rd south side between Lakeshore & Lakeshore	12	1	8%	3	25%	4	33%	4	33%	3	25%	3	25%	3	25%	2	17%	2	17%
Pearl St east side between Lakeshore & Pine	7	1	14%	3	43%	7	100%	7	100%	7	100%	2	29%	5	71%	3	43%	4	57%

Time	# Stalls	12:00		12:20		12:40		13:00		13:20		13:40		14:00		14:20		14:40	
Lot 5 Brant St Lot	60	37	62%	35	58%	39	65%	47	78%	56	93%	50	83%	51	85%	43	72%	34	57%
John St west side between Pine & Lot 5	3	3	100%	3	100%	3	100%	3	100%	0	0%	2	67%	2	67%	3	100%	3	100%
John St west side between Lakeshore & Pine	5	5	100%	5	100%	5	100%	5	100%	4	80%	4	80%	5	100%	5	100%	5	100%
John St east side between Lakehsore & Pine	6	5	83%	5	83%	6	100%	6	100%	6	100%	5	83%	6	100%	5	83%	2	33%
Brant St east side between Lakeshore & Pine	2	3	150%	2	100%	2	100%	3	150%	1	50%	1	50%	2	100%	1	50%	1	50%
Brant St west side between Lakeshore & Elgin	8	10	125%	8	100%	10	125%	8	100%	7	88%	7	88%	7	88%	8	100%	8	100%
Pine St north side between Brant & John	3	3	100%	3	100%	3	100%	3	100%	2	67%	3	100%	3	100%	3	100%	2	67%
Brant St east side between Pine & Elgin/Lot 5	8	7	88%	7	88%	8	100%	7	88%	8	100%	8	100%	6	75%	7	88%	6	75%
Lakeshore Rd south side between Elizabeth & Pearl	7	2	29%	2	29%	2	29%	5	71%	3	43%	4	57%	3	43%	3	43%	1	14%
Elizabeth St west side between Pine & Lot 4	6	7	117%	5	83%	5	83%	6	100%	5	83%	6	100%	6	100%	5	83%	4	67%
Lot 4 Elizabeth St Lot	97	79	81%	81	84%	80	82%	83	86%	72	74%	73	75%	70	72%	67	69%	64	66%
Lot 1 Pearl St Lot	39	33	85%	31	79%	33	85%	30	77%	29	74%	31	79%	30	77%	29	74%	31	79%
Pearl St west side between Pine & Lot 1	8	7	88%	7	88%	6	75%	7	88%	7	88%	6	75%	7	88%	8	100%	8	100%
Pine St north side between Elizabeth & Pearl	9	9	100%	9	100%	7	78%	7	78%	9	100%	8	89%	9	100%	9	100%	9	100%
Pine St north side between Pearl & Martha	4	5	125%	3	75%	4	100%	2	50%	2	50%	3	75%	4	100%	5	125%	5	125%
Lot 4 Martha St Lot	11	5	45%	5	45%	7	64%	5	45%	4	36%	4	36%	4	36%	4	36%	5	45%
Martha St west side between Lakeshore & Pine	6	4	67%	4	67%	1	17%	2	33%	2	33%	3	50%	1	17%	1	17%	2	33%
Old Lakeshore Rd south side between Lakeshore & Lakeshore	12	2	17%	1	8%	1	8%	1	8%	2	17%	2	17%	2	17%	1	8%	2	17%
Pearl St east side between Lakeshore & Pine	7	5	71%	4	57%	7	100%	7	100%	5	71%	7	100%	6	86%	7	100%	8	114%

Time	# Stalls	15:00		15:20		15:40		16:00		16:20		16:40		17:00		17:20		17:40	
Lot 5 Brant St Lot	60	36	60%	35	58%	32	53%	32	53%	34	57%	31	52%	31	52%	22	37%	26	43%
John St west side between Pine & Lot 5	3	3	100%	2	67%	0	0%	0	0%	0	0%	0	0%	1	33%	3	100%	0	0%
John St west side between Lakeshore & Pine	5	2	40%	3	60%	3	60%	5	100%	3	60%	3	60%	4	80%	5	100%	5	100%
John St east side between Lakehsore & Pine	6	2	33%	0	0%	1	17%	2	33%	3	50%	5	83%	5	83%	6	100%	6	100%
Brant St east side between Lakeshore & Pine	2	3	150%	3	150%	3	150%	3	150%	3	150%	2	100%	3	150%	3	150%	3	150%
Brant St west side between Lakeshore & Elgin	8	6	75%	9	113%	5	63%	8	100%	5	63%	6	75%	7	88%	8	100%	8	100%
Pine St north side between Brant & John	3	1	33%	2	67%	1	33%	2	67%	3	100%	1	33%	3	100%	3	100%	3	100%
Brant St east side between Pine & Elgin/Lot 5	8	5	63%	6	75%	6	75%	3	38%	4	50%	7	88%	7	88%	8	100%	8	100%
Lakeshore Rd south side between Elizabeth & Pearl	7	1	14%	1	14%	1	14%	2	29%	1	14%	1	14%	2	29%	2	29%	2	29%
Elizabeth St west side between Pine & Lot 4	6	4	67%	3	50%	5	83%	3	50%	3	50%	5	83%	6	100%	14	233%	6	100%
Lot 4 Elizabeth St Lot	97	63	65%	57	59%	58	60%	58	60%	53	55%	53	55%	52	54%	57	59%	59	61%
Lot 1 Pearl St Lot	39	32	82%	31	79%	33	85%	38	97%	36	92%	37	95%	37	95%	26	67%	36	92%
Pearl St west side between Pine & Lot 1	8	8	100%	7	88%	6	75%	7	88%	6	75%	8	100%	8	100%	7	88%	7	88%
Pine St north side between Elizabeth & Pearl	9	6	67%	8	89%	9	100%	6	67%	6	67%	7	78%	9	100%	9	100%	9	100%
Pine St north side between Pearl & Martha	4	6	150%	6	150%	6	150%	4	100%	6	150%	6	150%	5	125%	5	125%	5	125%
Lot 4 Martha St Lot	11	5	45%	5	45%	5	45%	5	45%	5	45%	5	45%	5	45%	5	45%	5	45%
Martha St west side between Lakeshore & Pine	6	2	33%	2	33%	2	33%	1	17%	2	33%	1	17%	0	0%	0	0%	0	0%
Old Lakeshore Rd south side between Lakeshore & Lakeshore	12	3	25%	4	33%	4	33%	5	42%	4	33%	4	33%	5	42%	7	58%	10	83%
Pearl St east side between Lakeshore & Pine	7	7	100%	7	100%	6	86%	6	86%	5	71%	4	57%	4	57%	7	100%	7	100%

Time	# Stalls	18:00		18:20		18:40		19:00		19:20		19:40		20:00		20:20		20:40		Max
Lot 5 Brant St Lot	60	28	47%	40	67%	41	68%	42	70%	41	68%	38	63%	34	57%	35	58%	33	55%	**93%**
John St west side between Pine & Lot 5	3	2	67%	2	67%	3	100%	3	100%	3	100%	1	33%	1	33%	0	0%	1	33%	**100%**
John St west side between Lakeshore & Pine	5	5	100%	5	100%	5	100%	5	100%	5	100%	4	80%	3	60%	3	60%	1	20%	**100%**
John St east side between Lakehsore & Pine	6	6	100%	6	100%	6	100%	6	100%	3	50%	3	50%	2	33%	1	17%	1	17%	**100%**
Brant St east side between Lakeshore & Pine	2	3	150%	3	150%	3	150%	3	150%	2	100%	2	100%	2	100%	2	100%	2	100%	**150%**
Brant St west side between Lakeshore & Elgin	8	8	100%	8	100%	9	113%	10	125%	10	125%	10	125%	9	113%	9	113%	5	63%	**125%**
Pine St north side between Brant & John	3	3	100%	2	67%	3	100%	3	100%	3	100%	3	100%	4	133%	4	133%	3	100%	**133%**
Brant St east side between Pine & Elgin/Lot 5	8	9	113%	9	113%	9	113%	9	113%	7	88%	8	100%	8	100%	7	88%	6	75%	**113%**
Lakeshore Rd south side between Elizabeth & Pearl	7	1	14%	2	29%	4	57%	3	43%	5	71%	4	57%	4	57%	3	43%	2	29%	**71%**
Elizabeth St west side between Pine & Lot 4	6	6	100%	5	83%	6	100%	6	100%	6	100%	6	100%	6	100%	5	83%	6	100%	**233%**
Lot 4 Elizabeth St Lot	97	71	73%	73	75%	74	76%	73	75%	70	72%	69	71%	57	59%	58	60%	54	56%	**86%**
Lot 1 Pearl St Lot	39	38	97%	39	100%	38	97%	39	100%	37	95%	34	87%	35	90%	34	87%	36	92%	**100%**
Pearl St west side between Pine & Lot 1	8	8	100%	8	100%	7	88%	8	100%	8	100%	7	88%	5	63%	3	38%	3	38%	**100%**
Pine St north side between Elizabeth & Pearl	9	9	100%	9	100%	9	100%	9	100%	9	100%	7	78%	9	100%	7	78%	9	100%	**100%**
Pine St north side between Pearl & Martha	4	6	150%	6	150%	6	150%	6	150%	4	100%	4	100%	4	100%	3	75%	2	50%	**150%**
Lot 4 Martha St Lot	11	5	45%	4	36%	4	36%	4	36%	4	36%	4	36%	4	36%	3	27%	3	27%	**64%**
Martha St west side between Lakeshore & Pine	6	0	0%	0	0%	0	0%	2	33%	2	33%	1	17%	2	33%	1	17%	0	0%	**67%**
Old Lakeshore Rd south side between Lakeshore & Lakeshore	12	11	92%	11	92%	12	100%	12	100%	12	100%	11	92%	11	92%	12	100%	10	83%	**100%**
Pearl St east side between Lakeshore & Pine	7	7	100%	6	86%	8	114%	8	114%	8	114%	8	114%	4	57%	3	43%	1	14%	**114%**

Time	# Stalls	Avg
Lot 5 Brant St Lot	60	57%
John St west side between Pine & Lot 5	3	50%
John St west side between Lakeshore & Pine	5	73%
John St east side between Lakehsore & Pine	6	62%
Brant St east side between Lakeshore & Pine	2	114%
Brant St west side between Lakeshore & Elgin	8	98%
Pine St north side between Brant & John	3	79%
Brant St east side between Pine & Elgin/Lot 5	8	83%
Lakeshore Rd south side between Elizabeth & Pearl	7	29%
Elizabeth St west side between Pine & Lot 4	6	85%
Lot 4 Elizabeth St Lot	97	68%
Lot 1 Pearl St Lot	39	80%
Pearl St west side between Pine & Lot 1	8	78%
Pine St north side between Elizabeth & Pearl	9	88%
Pine St north side between Pearl & Martha	4	114%
Lot 4 Martha St Lot	11	39%
Martha St west side between Lakeshore & Pine	6	25%
Old Lakeshore Rd south side between Lakeshore & Lakeshore	12	43%
Pearl St east side between Lakeshore & Pine	7	80%