Old Lake Shore Road Transportation Impact Study, Parking Study and TDM Options Report

Paradigm Transportation Solutions Limited

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Project Summary

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Old Lakeshore Road Transportation Impact Study, Parking Study and TDM Options Report

Signatures



Signature

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study (TIS) and Transportation Demand Management (TDM) Options Report for a mixed-use development located within the southwest corner of Lakeshore Road and Old Lakeshore Road in Burlington, Ontario. Development of the property includes consolidating 2107 and 2119 Old Lakeshore Road into a single development parcel.

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

This study evaluated the impacts of background traffic growth and projected the impacts of the development within the construction of 150 condominium units and 6,451± sf of ground floor retail uses. Access to the site is proposed via two a one-way inbound driveway connection from Lakeshore Road and an all-directional driveway to Old Lakeshore Road. The Lakeshore Road connection will accommodate garbage collection, loading and service activities of the development whereas the Old Lakeshore Road connection will facilitate access to the underground parking garage area.

Full-build out of the development is projected to generate approximately 50 new vehicle trips during the weekday AM peak hour and 59 new vehicle trips during the weekday PM peak hour.

Of importance, the development is located within a designated Anchor Mobility Hub (Downtown Bus Terminal) which is planned to integrate rapid transit, regional transit and local transit. Within the development located in an Anchor Mobility Hub, the land use lends itself to being less reliant on auto use where residents and visitors can take advantage of additional transportation choices; walking, cycling and transit. As a result, it is expected that the land use will generate reduced vehicle trips and parking demand due to the locale.

The Halton Region Transportation Master Plan (2031) – The Road to Change defines a sustainable, integrated transportation system that considers all modes of travel (automobiles, transit, cycling, walking) and supports the policies and objectives arising out of the Halton Region Official Plan Review to the year 2031 (ROPA 38).

The Region has identified aggressive transit mode share targets to be reached over the next 12 years with transit mode share seeking a target of

20% of all trips. Since the immediate study area is currently achieving half of this target, the intensification of this site as a transit-oriented development will transform the resident mode share that is needed to meet the Region's target. The intensification of the downtown will be key to moving towards the Region's mode share targets by directing growth to encourage a pedestrian, cycling and transit-first community, where dependence on the private automobile is minimized.

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.

It is acknowledged that deficiencies at the Lakeshore Road and Martha Street intersection are projected to occur in the future with anticipated growth in traffic, independent of the development. To address these deficiencies the following mitigation measure is recommended to be implemented by the City:

- **Lakeshore Road and Martha Street** – The City consider restricting the southbound approach to right turns only during the weekday AM peak hour from Monday to Friday. This improvement is recommended to address projected capacity deficiencies and potential delay, independent of the proposed development.

A left turn lane warrant analysis was conducted along Old Lakeshore Road at Driveway A and found that a left-turn lane is not warranted to service development traffic.

Parking

Zoning By-law 2020 is the current in-force By-law for the City of Burlington and stipulates a parking rate of 1.25 spaces per unit is required for the

development (i.e. 188 parking spaces). The proposed site provides for a total of 155 parking spaces; equating to a ratio of 1.03 spaces per unit.

The parking requirements outlined in Zoning By-Law 2020 is based on an approach the caters to auto oriented travel rather than transition to promote residential and visitor travel through sustainable modes. Parking ratios need to recognize empirical evidence that parking demand has many factors and varies according to household size, income, auto ownership, and locational factors such as proximity to other uses and availability of multiple transportation mobility options.

A review of actual parking demand that is likely to be generated by the proposed development has been considered to assess, independent and separate from a review of Zoning By-Law requirements. The actual demand established is based upon parking demand technical resources and information collected by Paradigm at comparable land uses. The actual parking demand for the proposed development based on this data is projected to be 149 vehicles; equating to a ratio of 0.99 spaces per unit (resident and visitor).

Based on the imperial data collected as part of this study, it is evident that parking demand at High-Rise developments are significantly lower than the rates stipulated in the City's Zoning By-law. The data collected at a local level and through industry standard data is reflected of real-world conditions and supports a lower level of parking demand than what current and proposed Zoning By-law requires.

With the development located in a future Anchor Mobility Hub, the development has the potential to be transit supportive and promote active transportation. It will also introduce the residential population of the development to maximize the benefits of the site's location to a comprehensive and integrated transit system (Burlington Transit and GO Transit). As the development promotes the use of other modes of transportation through a limited number of on-site vehicle parking, the development has a significant role in setting an example for residents to consider non-automotive travel if they chose.

The projected demand provides a statistically valid justification that the proposed parking supply of 155 spaces (1.03 spaces per unit) is sufficient for the intended use.

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 City of Burlington recognize the conclusions drawn above;
- Site Driveway operate with a single inbound and outbound travel lane with stop control provided for the minor approach;
- Optimizing select signals, if necessary, after build-out to better support the future traffic volumes and travel patterns;
- The applicant develops and implement a TDM plan with the measures identified herein to support sustainable travel modes.

Through the combination of the mitigation measures proposed to address future deficiencies, the projected future traffic volumes can be accommodated within the study area.

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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 2107 and 2119 Lakeshore Road in the City of Burlington, Ontario. **Figure 1.1** details the location of the subject site and the study area.

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 the additional traffic forecast to be generated by the redevelopment of the subject site;
- Assign the forecast traffic to the surrounding road network based on the existing traffic patterns in the study area;
- 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;
- Review and identify potential Transportation Demand Management (TDM) measures that can be implemented for the proposed development.

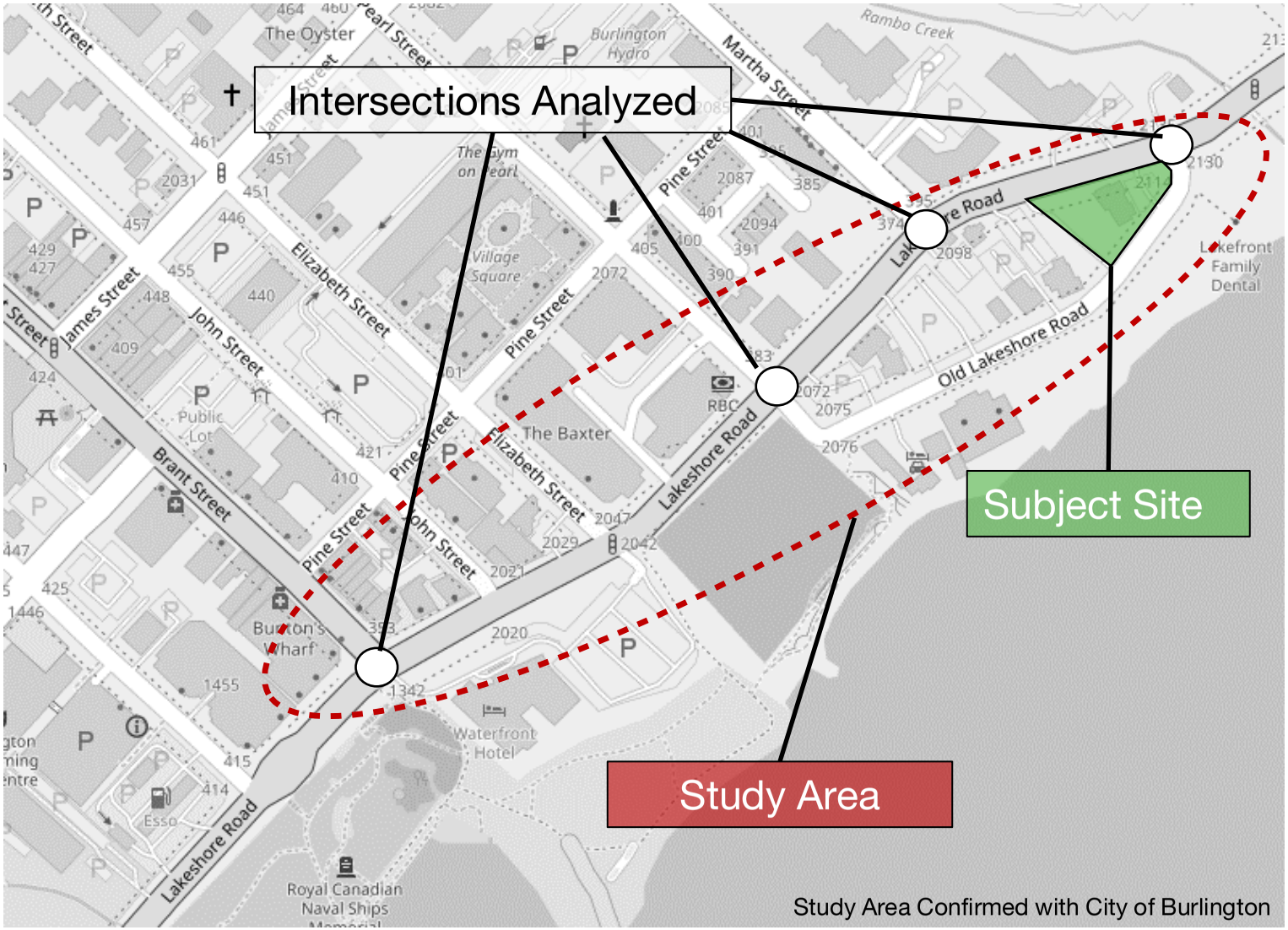
This report has been prepared to meet the Region of Halton's TIS Guidelines[1]. The report assesses the 2029 horizon (five (5) years beyond expected build-out of the site).

[1] Region of Halton. Transportation Impact Study Guidelines. January 2015.

1.3 Study Area

Based on pre-consultation with the City of Burlington, the following intersections have been identified as requiring investigation with respect to the impacts of the additional traffic due to the development of the subject site:

- Lakeshore Road at Martha Street (unsignalized);
- Lakeshore Road at Pearl Street (signalized);
- Lakeshore Road at Brant Street (signalized);
- Lakeshore Road at Old Lakeshore Road (unsignalized);



Location of Subject Site & Study Area

Figure 1.1

2 Existing Conditions

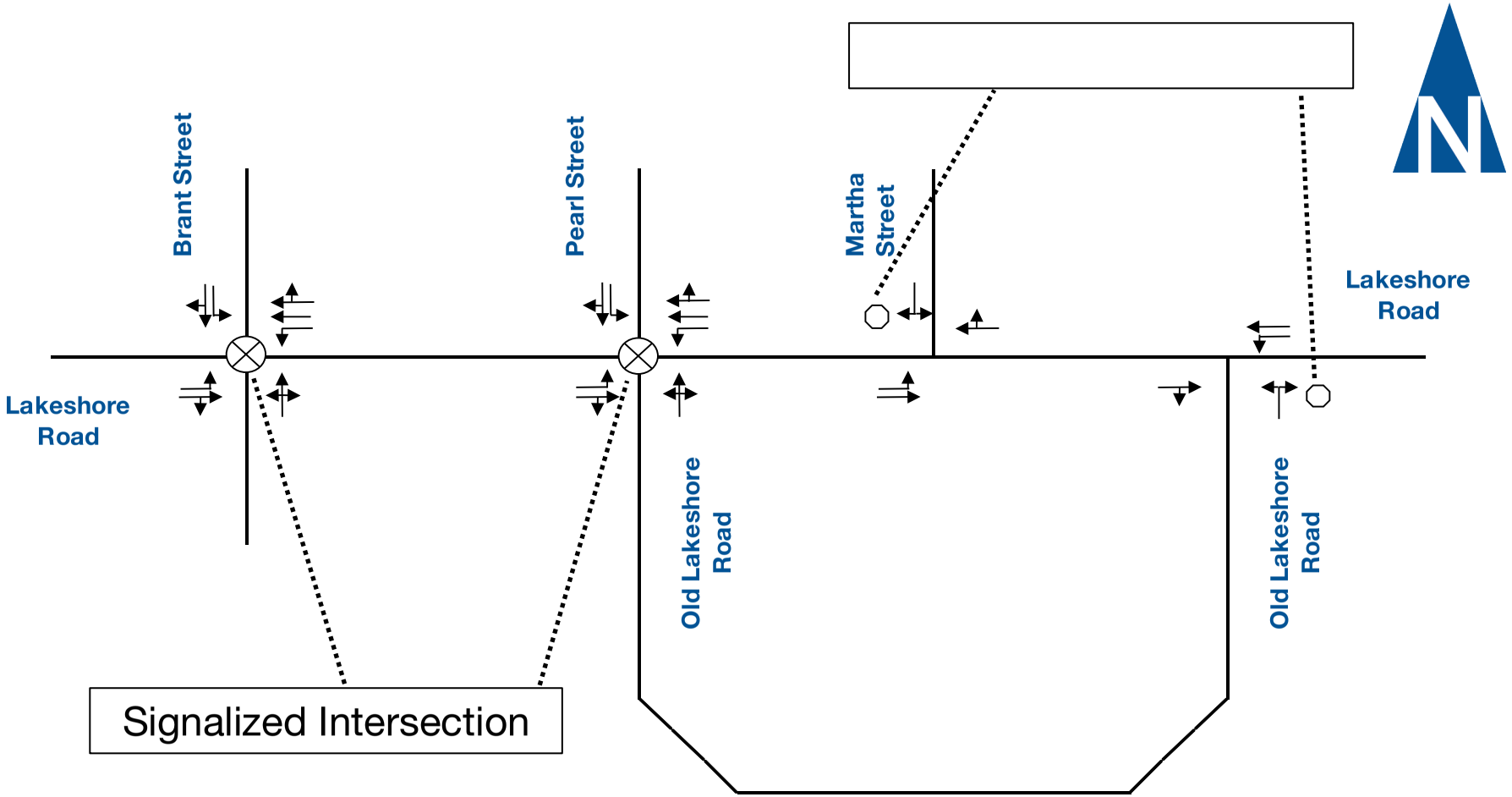
This section of the report provides an overview of the existing conditions on the roadways in the study area.

2.1 Existing Roadways

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

- **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 posted speed limit is 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.
- **Brant Street** is a north-south two-lane local 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.
- **Old 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, 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 Configuration & Traffic Control

2.2 Existing Transit Service

2.2.1 City of Burlington Transit Service

Burlington Transit (BT) is the public transit operator for the City of Burlington and operates 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.

In addition, the development is approximately a 500-metre walk to the Downtown Burlington bus terminal (Anchor Mobility Hub) which provides significant access to additional local routes.

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**.**



Existing Transit Service

Figure 2.2

2.3 Active Transportation

2.3.1 Walkability

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 the urban growth centre and is 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 85 and is considered a “Very Walkable” location which means most daily errands can be accomplished on foot without the need of a personal vehicle[2].

2.3.2 Cycling

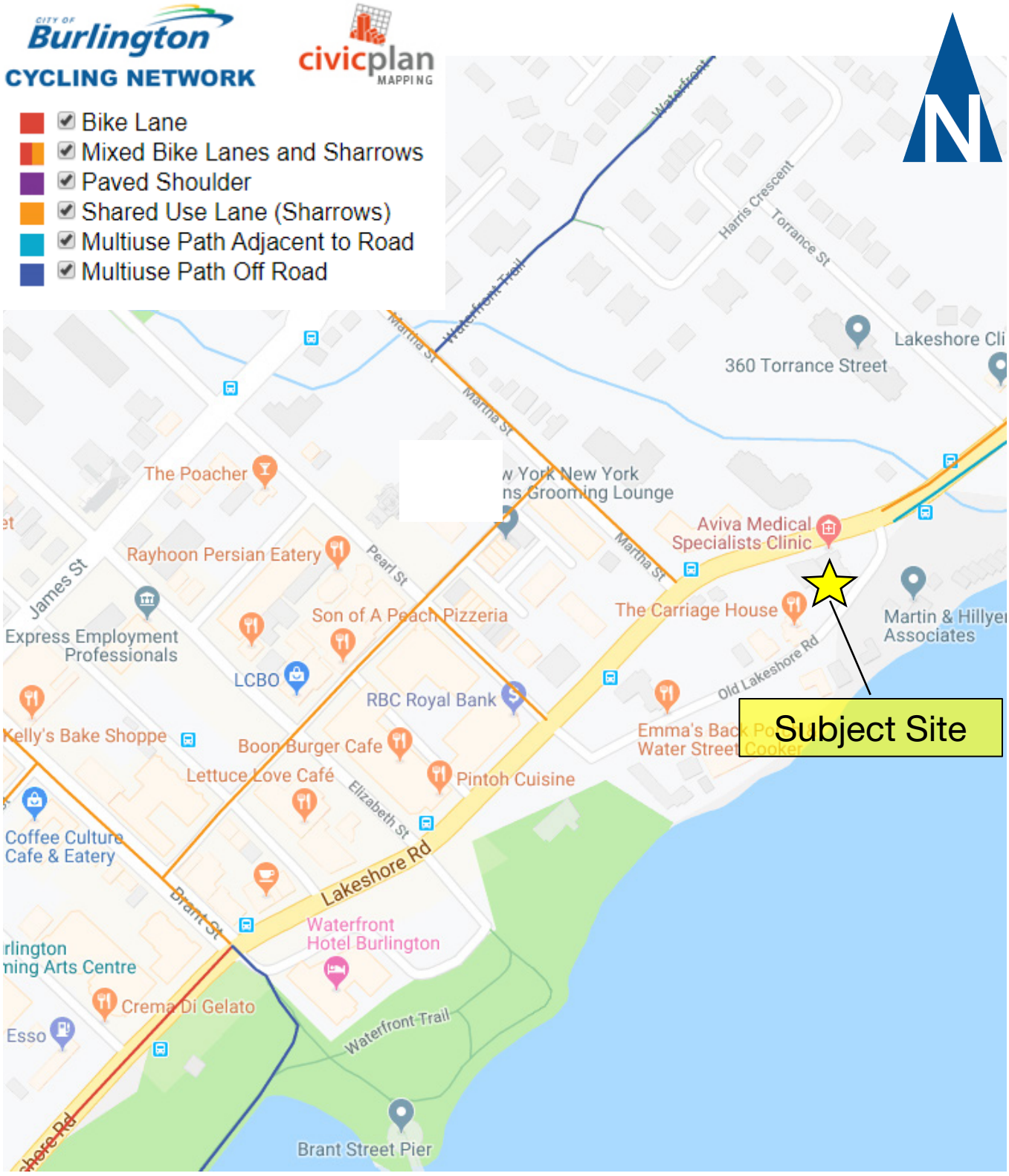
The City’s cycling infrastructure consists of on-street and off-street facilities. On-street routes are comprised of bicycle lanes, signed bicycle routes and paved shoulders. Off-street facilities are in the form of multi-use paths.

The City’s 2016 Cycling Map[3] identifies several cycling facilities on the study area roadways. Brant Street, Martha Street, Pine Street and Pearl Street currently operate with shared use shoulders (sharrows). Lakeshore Road currently has a bike lane from Brant Street west to Maple Avenue. A field visit conducted in October 2016 confirmed these facilities.

A review of the City’s Cycling Master Plan[4] has identified Brant Street and Caroline Street as proposed Bicycle Priority Streets, and Elgin Street as a future location for bike lane infrastructure. The Cycling Master Plan has also identified Lakeshore Road east of Brant Street as a future location for bike lane infrastructure.

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

[2] https://www.walkscore.com/score/2069-lakeshore-rd-burlington-on-canada
[3] City of Burlington: Cycling Network. Civic Plan Mapping, 2016.
[4] City of Burlington: Cycling Master Plan. Prepared by IBI Group, July 2009.



Existing Cycling Network

Figure 2.3

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 A** 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 SUMMARY

Intersection	Date	Conduced By
Brant Street at Lakeshore Road	April 2018	City of Burlington
Lakeshore Road at Pearl Street	November 2018	Paradigm
Lakeshore Road at Martha Street	February 2020	Paradigm
Lakeshore Road at Old Lakeshore Road	February 2020	Paradigm

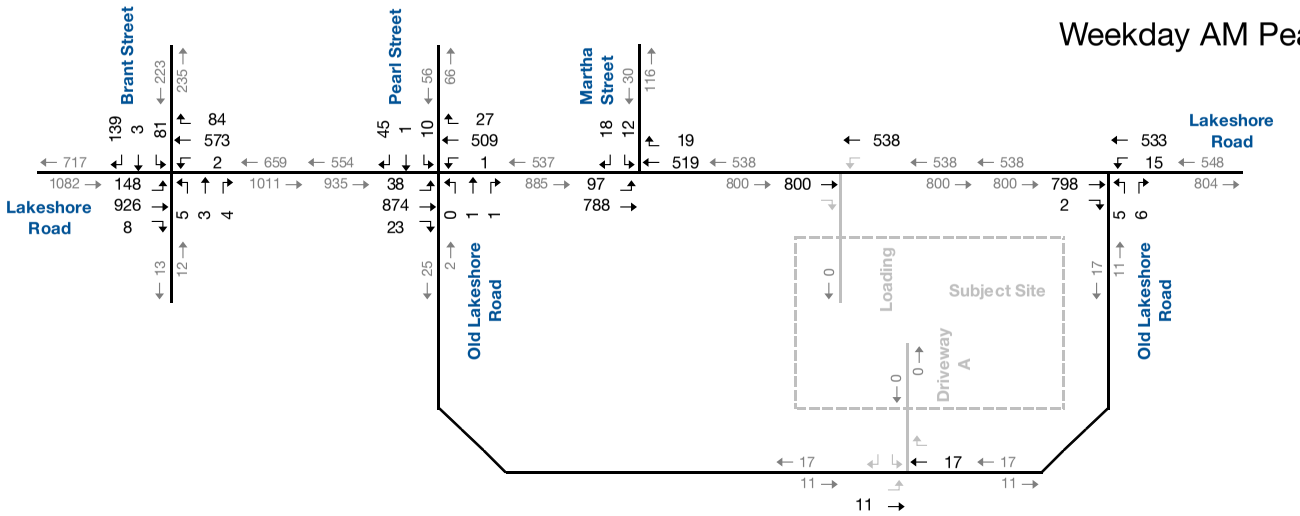
2.4.2 Base Year Adjustments

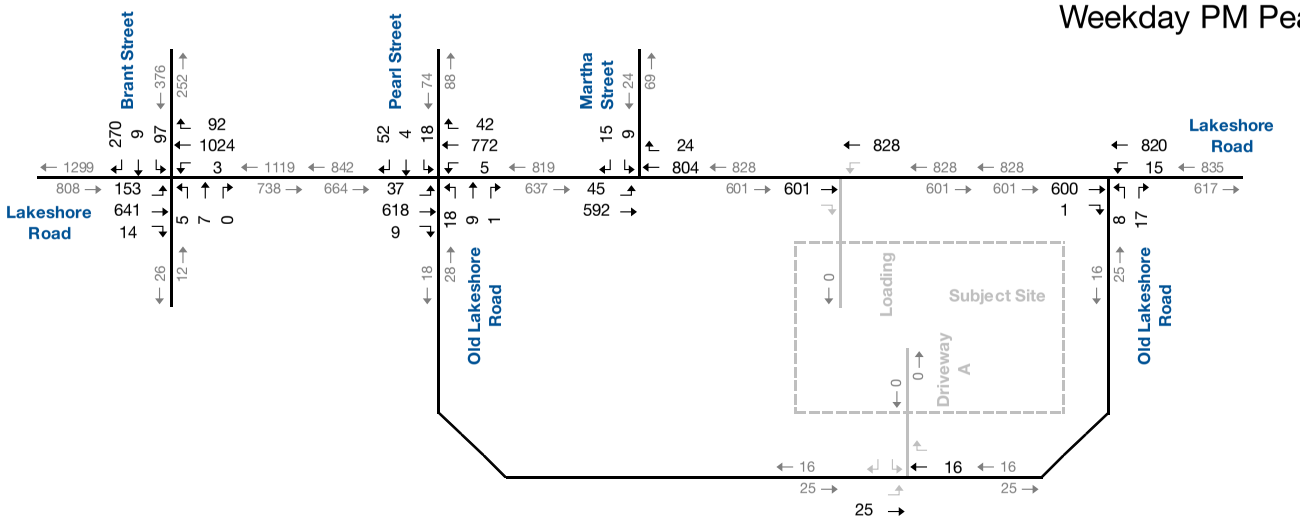
Turning movement counts conducted prior to year 2019 have been factored with the use of a 1.0 percent per annum growth rate to reflect 2019 Base Year conditions.

2.4.3 Volume Balancing

As no major intersections or access points are provided between Pearl Street and Old Lakeshore Road, volume balancing has been applied to the traffic volumes along Lakeshore Road to ensure reasonable upstream and downstream flow was maintained at these study area intersections.

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





Adjusted Base Year Weekday Peak Hour Traffic Volumes

3 Development Concept

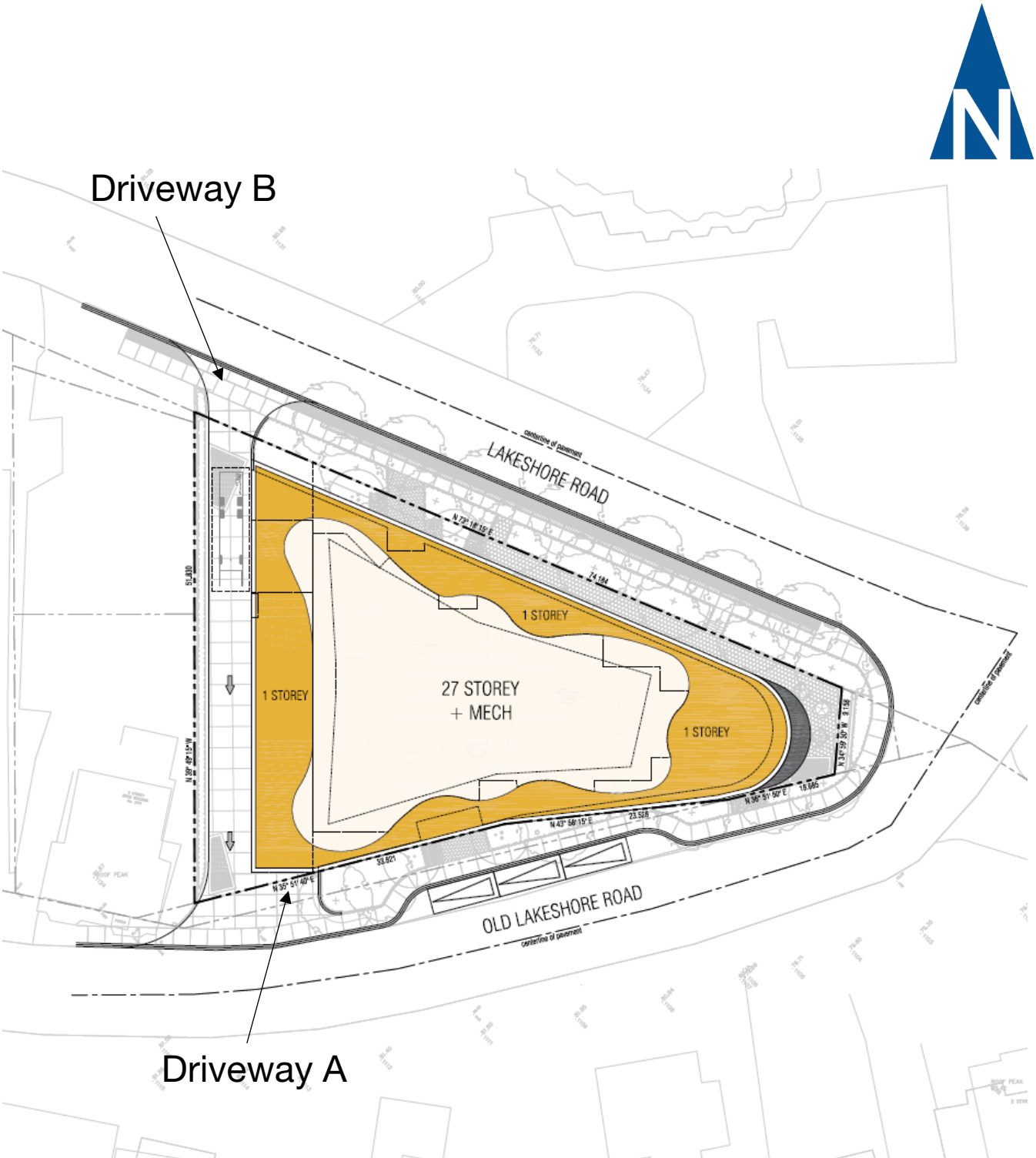
3.1 Site Description

Development of 2107 and 2119 Old Lakeshore Road will include demolishing several existing buildings and constructing a 27-storey mixed-use building that will contain 599 square metres (6,451 square feet) of retail space and 150 condominium units. A five-level underground parking garage with 155 parking stalls is provided as well as three lay-by spaces along Old Lakeshore Road for short term and pickup/drop-offs. Build out is anticipated to occur in one phase by 2023.

Vehicular access to the site is proposed via two driveway connections to Old Lakeshore Road and Lakeshore Road:

- Access to Old Lakeshore Road (Driveway) is located approximately 80 metres southwest of the Lakeshore Road and Old Lakeshore Road intersection (centreline to centreline). This connection will facilitate access to the underground parking garage.
- Access to Lakeshore Road (Loading Access) is located approximately 55 metres east of the Lakeshore Road and Martha Street intersection (centreline to centreline). This connection provides access solely to the loading area on the ground level accommodating garbage collection, loading and service activities of the development. The driveway has been designed to operate with one-way operation with travel permitted in a north-south direction. Given the limited functionality in terms of peak hour traffic, this connection has not been analyzed.

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



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Site Plan

3.2 Development 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 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[5]. The following land uses (LUC) have been utilized:

- 222 – Multi-Family Housing (High-Rise); and
- 820 – Shopping Centre.

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. If no equations were provided or satisfactory R^2 values and independent variables were unavailable, the average rates have been applied.

The resulting summation is the "raw" trip generation – unadjusted for modal split credits. The effects of these 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 Internal Capture

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

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

By way of example, it is likely that some portion of the traffic destined to and from the retail uses located within the site will originate from the on-site residential units, requiring only a walking trip. The ITE Trip Generation

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

Handbook has been utilized to account for internal trips within the development. The detailed calculations are provided in **Appendix B**.

ITE data suggests an internal capture rate of 0% for the weekday AM peak hour and 12% for the weekday PM peak hour.

3.2.3 Pass-By Trips

The estimates of pass-by trips were derived using the Trip Generation Handbook published by ITE[6]. Pass-by trips are a subset of trip generation that only apply to commercial/retail developments. These trips are made by vehicles already present on the roadway in which businesses attract them into their site as they are passing by.

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

3.2.4 Study Area 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 2011 Zones 2059-2069) was extracted from the 2016 Transportation Tomorrow Survey (TTS)[7] and is outlined in **Table 3.1**.

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%**

[6] Institute of Transportation Engineers. Trip Generation Handbook, 2nd Edition. Washington D.C. 2004.
[7] Transportation Tomorrow Survey (TTS), 2011, Summary by Traffic Zones, Data Management Group, University of Toronto.

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 for the residential component.

3.2.5 Region Modal Split Targets

The Halton Region Transportation Master Plan (2031) – The Road to Change[8] defines a sustainable, integrated transportation system that considers all modes of travel (automobiles, transit, cycling, walking) and supports the policies and objectives arising out of the Halton Region Official Plan Review to the year 2031 (ROPA 38). The vision for this plan is:

> *"The Road to Change must accommodate various travel choices and support a sustainable and multi-modal network. It must encourage people to change their travel characteristics, maximise the use of transit and other alternatives to the single occupant vehicle, and be aware of the consequences if they do not change".*

The intensification of the downtown will be key to moving towards the Region's mode share targets by directing growth to encourage a pedestrian, cycling and transit-first community, where dependence on the private automobile is minimized. The location, design, configuration and mix of uses in a transit-oriented development provide an alternative to current suburban development trends by emphasizing a pedestrian-oriented environment and reinforcing the use of transit.

The Region has identified aggressive transit mode share targets to be reached over the next 12 years with transit mode share seeking a target of 20% of all trips. Since the immediate study area is currently achieving half of this target, the intensification of this site as a transit-oriented development will transform the resident mode share that is needed to meet the Region's target.

[8] The Road to Change, Halton Regional Transportation Master Plan (2031), September 2011.

3.2.6 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 internal, pass-by and modal split credits made as noted earlier.

As shown, with build-out of the development approximately 50 net new trips during the weekday AM peak hour and 59 during the weekday PM peak hour are forecast to be added to the area roadways. With the net new forecast volume of traffic traveling within the study area being determined, these new trips can be assigned to the surrounding roadway network as described in the following sections.

TABLE 3.2: NET TRIP GENERATION SUMMARY

Land Use Code	GFA (sq. ft.)	Units	Trips	AM Peak Hour				PM Peak Hour			
				Rate	In	Out	Total	Rate	In	Out	Total
222 - Multi-Family Housing High Rise (Units)	-	150	Total	Eqn.	13	42	**55**	Eqn.	36	24	**60**
			Internal	0%	0	0	**0**	8%	4	1	**5**
			Modal Split	20%	3	8	**11**	20%	7	5	**12**
			New	80%	10	34	**44**	72%	25	18	**43**
820 - Shopping Centre (GFA)	6,451	-	Total	0.94	4	2	**6**	3.81	12	13	**25**
			Internal	0%	0	0	**0**	20%	1	4	**5**
			Modal Split	0%	0	0	**0**	0%	0	0	**0**
			Pass-By	0%	0	0	**0**	34%	4	4	**9**
			New	100%	4	2	**6**	80%	7	9	**11**
Total Trip Generation			**Total**	100%	17	44	**61**	100%	48	37	**85**
			Internal	0%	0	0	**0**	12%	5	5	**10**
			Modal Split	18%	3	8	**11**	14%	7	5	**12**
			Pass-By	0%	0	0	**0**	10%	4	4	**9**
			New	82%	14	36	**50**	69%	32	27	**59**

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)[9]. 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 C**.

Table 3.3 summarizes the estimated trip distribution for the development.

TABLE 3.3: TRIP DISTRIBUTION

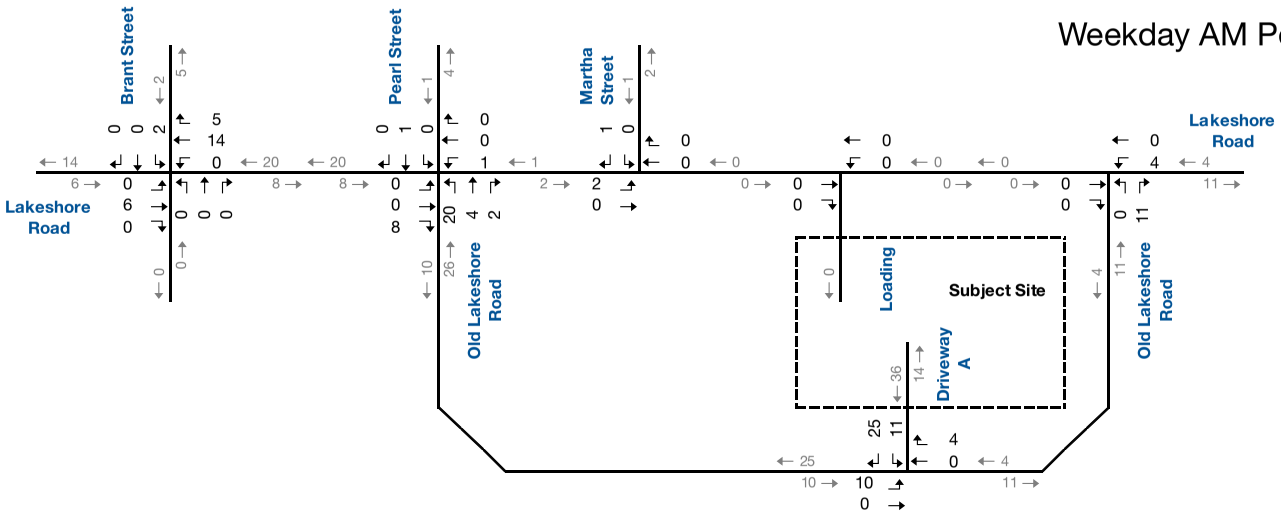
Direction (to/from)	Travel Route	Distribution
North	Brant Street	15%
North	Pearl Street	10%
North	Martha Street	5%
East	Lakeshore Road	30%
West	Lakeshore Road	40%
Total		**100%**

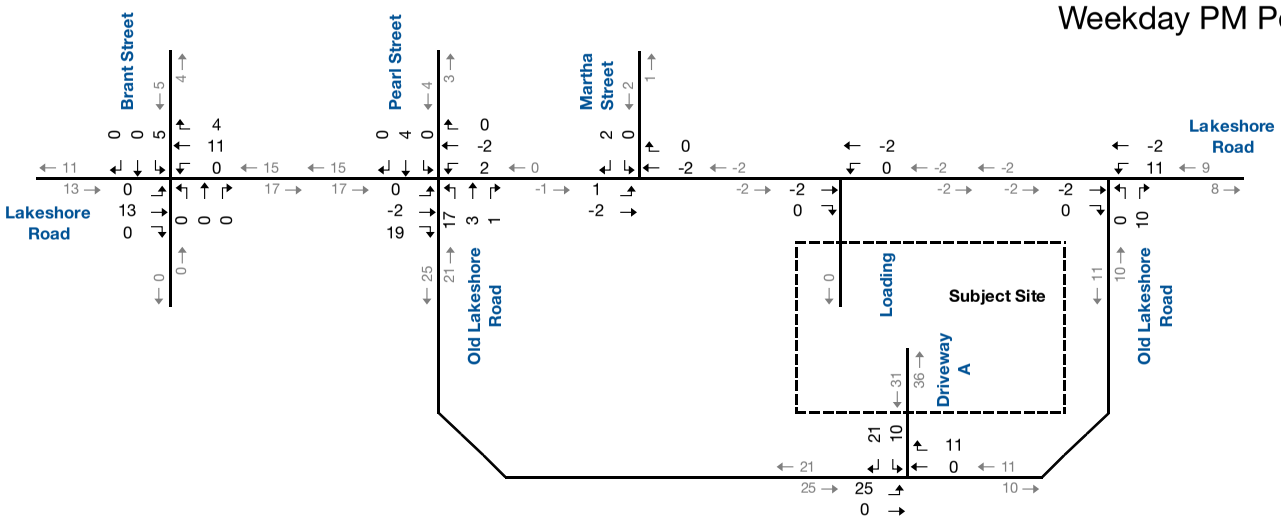
Using the trip generation data and trip distribution estimates the site traffic was assigned to the road network.

3.3.2 Assignment

The assignment of development forecasts utilized a single access to the development through Pearl Street (Site Driveway). The weekday AM and PM peak hour site generated traffic volumes are illustrated in **Figures 3.2A – 3.2B.**

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





Site Generated Weekday Peak Hour Traffic Forecast

4 Future Conditions

To be consistent with the Region of Halton's Transportation Impact Study Guidelines, a horizon year of 2029, five (5) years beyond the anticipated opening year (2024), has been used for traffic forecasting and analyses purposes.

4.1 Traffic Growth

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

4.1.1 General Growth

A general growth rate of 1.0 percent was applied to the area roadways to account for population and employment growth.

4.1.2 Area Development Growth

Paradigm prepared a TIS for 2069 Lakeshore Road[10]. The following developments are included in the 2069 Lakeshore Road TIS (501-515 John Street; 2042-2054 Lakeshore Road; 374 Martha Street; 425 Locust Street; 421-431 Brant Street; 2069 Lakeshore Road; 409 Brant Street). This TIS provides traffic forecast for a planning horizon of 2027 with a development assumption of 1,200 residential units, 150 hotel units, 108,00 square feet of office space and 30,000 square feet of commercial space.

Additionally, since this study was completed, it is understood that a number of additional developments are proposed:

- 401-417 Martha Street;
- 2085 Pine Street;
- 2082, 2086 and 2090 James Street;
- 1381 Lakeshore Road; and
- 2100 Lakeshore Road

The projections for these sites have been taken from the respective studies completed for these sites.

Appendix D contains the background development projections.

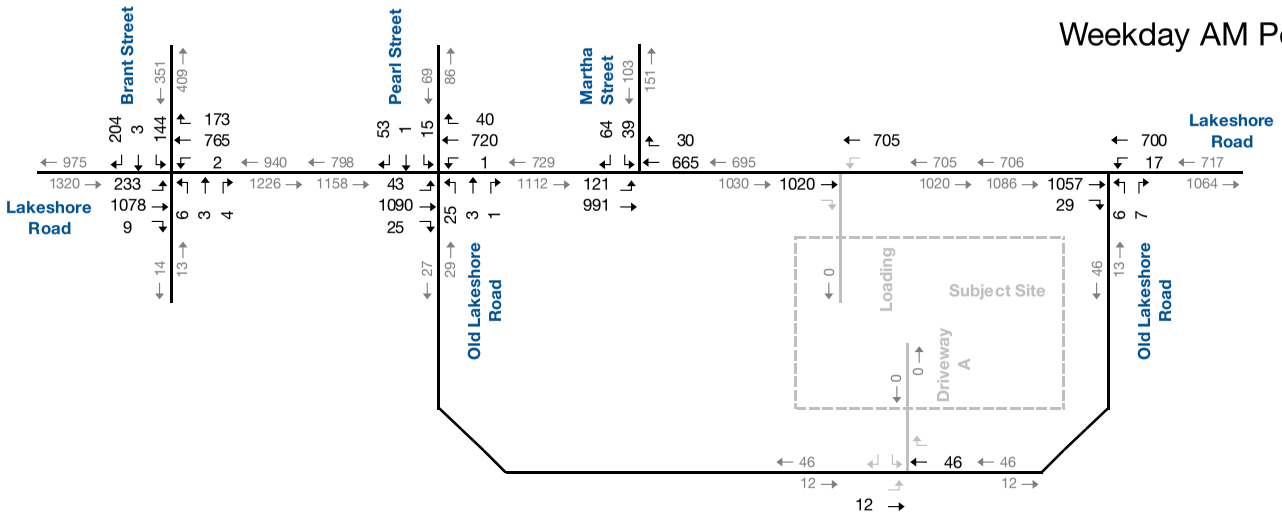
[10] 170177: 2069 Lakeshore Road Transportation Impact Study, Parking Study and TDM Options Report Paradigm, August 2018.

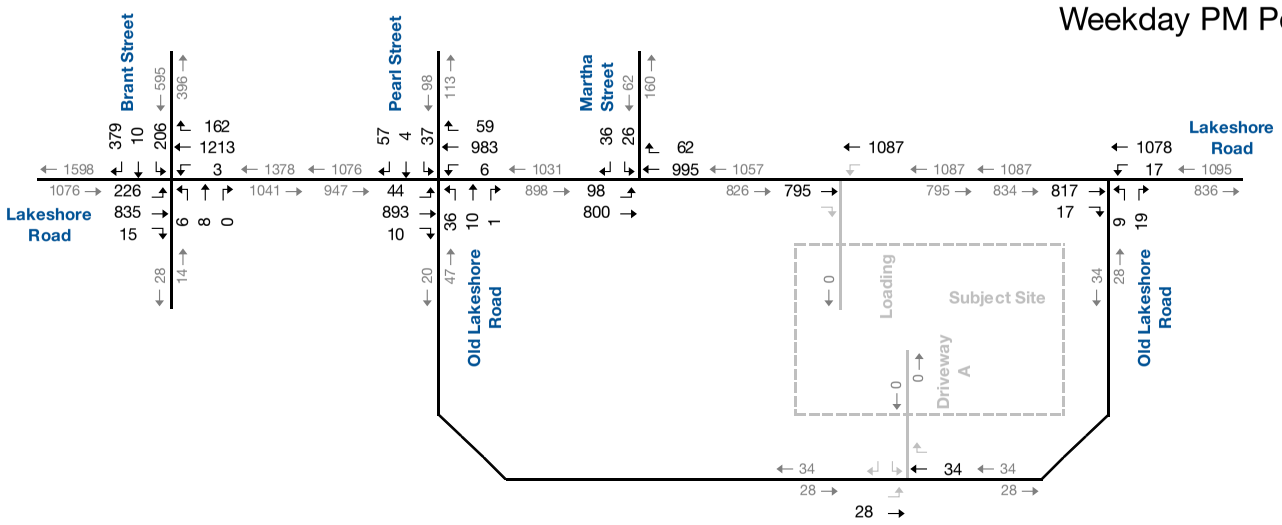
4.1.3 Background Projections

The weekday peak hour background traffic volumes for 2029 are illustrated in **Figure 4.1**.

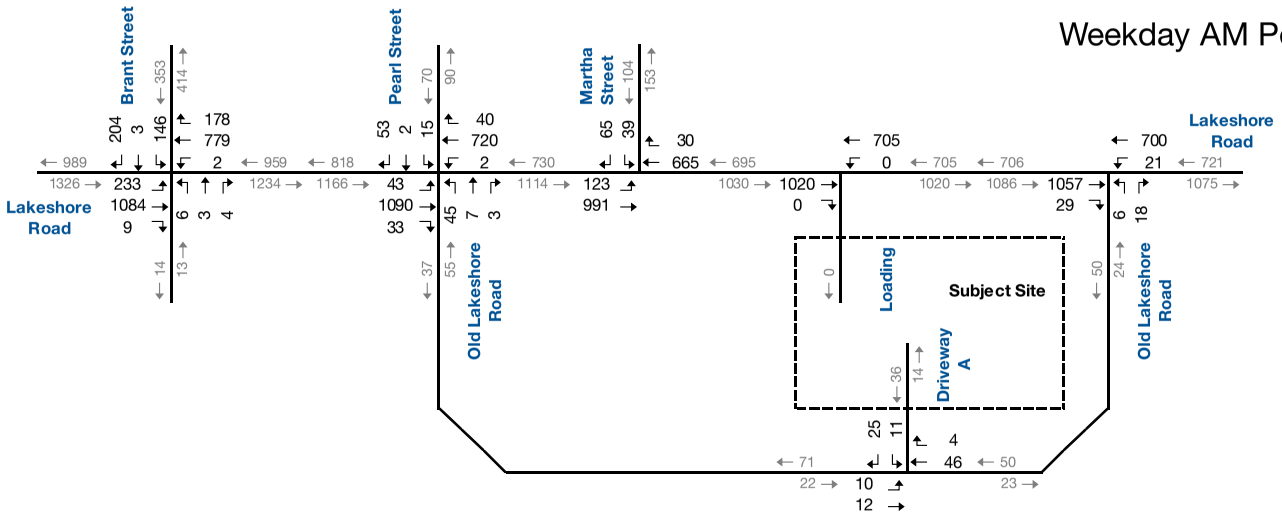
4.1.4 Total Projections

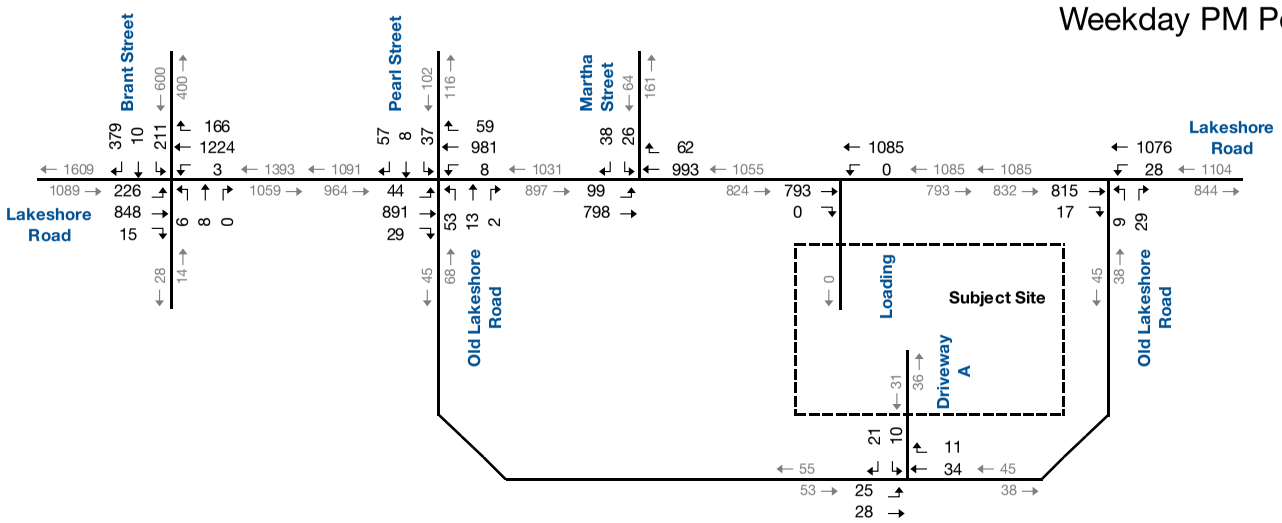
The projected site-generated traffic volumes were added to the Background projections to develop the Total traffic volumes. The weekday peak hour Total traffic volumes for 2029 are illustrated in **Figure 4.2**.





2029 Background Weekday Peak Hour Traffic Forecast





2029 Total Weekday Peak Hour Traffic Forecast

5 Operational 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 Base Conditions and projected Background and Total Conditions. Capacity analysis provides an indication of how well the roadway facilities serve the traffic demands placed on them. Calculated levels of service classify roadway operating conditions.

5.1 Level of Service Criteria

Level of service (LOS) is the term used to denote the different operating conditions that occur on a given roadway segment under various traffic volume loads. It is a qualitative measure that provides an index to the operational qualities of a roadway segment or an intersection with designations that range from LOS A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. **Table 5.1** contains the level of service criteria for signalized and unsignalized (stop-controlled) intersections.

TABLE 5.1: VEHICLE LEVEL OF SERVICE DEFINITIONS

LOS	Signalized Intersections Average Total Delay (sec/veh)	Unsignalized 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

For signalized intersections, the analysis considered the operation of each lane or lane group entering the intersection and the level of service is for the overall conditions at the intersection. For unsignalized intersections, the analysis assumes that traffic on the mainline is not affected by traffic on the side streets. The level of service is only determined for left turns from the main street and all movements from the minor street.

Unsignalized intersections use conservative analysis parameters, such as high critical gaps. A “critical gap” is defined as the minimum time, in seconds, between successive major stream vehicles, in which a minor-street vehicle can make a maneuver. Actual field observations indicate that drivers on minor streets generally accept smaller gaps in traffic than those used in the analysis procedures and therefore experience less delay than reported by the analysis software. Consequently, the analysis results tend to overstate the actual delays experienced in the field.



For this reason, the results of the unsignalized intersection analyses should be considered conservative.

The evaluation criteria used to analyze intersections are based on the 2000 Highway Capacity Manual (HCM)[11] utilizing Synchro 9.1.

5.2 Intersection Capacity Analysis

Intersection capacity analyses were conducted at all intersections in the study area. Analyses were conducted for the 2017 Base Year Conditions as well as the 2029 Background and Total Conditions.

Table 5.2 - 5.4 summarize the capacity analyses for the study area intersections, respectively. The capacity analyses results are included in **Appendix E**. The following sub-sections outlines the operations of the study area intersections.

5.2.1 Brant Street and Lakeshore Road

The intersection of Lakeshore Road and Brant Street presently operates at LOS D and B overall during the weekday peak hours. The eastbound approach currently operates at LOS E and is expected to further degrade to LOS F without the proposed development under the 2029 horizon.

The development is expected to add a negligible volume (15 or fewer vehicle trips) to the critical eastbound approach. This level of additional traffic does not change the overall operations of the intersection.

Regardless of the development's minimal impacts at this location, mitigation measures appear to be appropriate. Specific improvements have been identified in **Chapter 6** – Proposed Mitigation Measures that are aimed at improving traffic operations and capacity at the intersection.

5.2.2 Lakeshore Road and Pearl Street

Individual movements at the signalized intersection of Lakeshore Road and Pearl Street presently operate at LOS D or better under the Base Year traffic conditions. Similar levels of operation are expected under future Background and Total conditions with only negligible increases in delay resulting from site-generated traffic volumes.

[11] Transportation Research Board, Highway Capacity Manual, Washing, D.C. 2003.

5.2.3 Lakeshore Road and Martha Street

Individual movements at the unsignalized intersection of Lakeshore Road and Martha Street presently operate at LOS C or better under the Base year traffic conditions. Under the future Background traffic conditions, the stop controlled southbound approach is projected to degrade to LOS F with a v/c ratio of 0.71 during the weekday AM peak hour. Similar levels of operation are expected under future Total traffic conditions with negligible increase in delay resulting from site-generated traffic volumes.

5.2.4 Lakeshore Road and Old Lakeshore Road

Individual movements at the unsignalized intersection of Lakeshore Road and John Street currently operate at LOS B or better under the Base year traffic conditions. Similar levels of operation are expected under future Background and Total traffic conditions with only negligible increase in delay resulting from site-generated traffic volumes. It is recognized that the northbound approach is projected to operate at LOS E under the Background conditions during the AM peak hour. As a v/c ratio of 0.56 is projected, the northbound approach is operating at 56% (or less) of its available capacity, mitigation measures do not appear appropriate.

5.2.5 Lakeshore Road and Driveway A

As described previously, a single new all-turn driveway is proposed to be constructed to provide access to the underground parking garage through Old Lakeshore Road. Under future conditions with the full-build out of the development, Driveway A is expected to operate at LOS A during the critical peak hours studied.

TABLE 5.2A: INTERSECTION CAPACITY ANALYSIS – (AM PEAK HOUR)

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	1. Lakeshore Road at Brant Street	TCS	Base Year	LOS	A	E	E	E	A	A	A	A	C	C	C	C	C	C	C	C	D
				Delay	6	67	67	59	8	10	10	10	26	26	26	26	29	26	26	27	39
				V/C	0.36	1.07	1.07		0.03	0.41	0.41		0.04	0.04	0.04		0.38	0.12	0.12		
				Q	14	273	273		1	46	46		5	5	5		25	15	15		
		TCS	2029 Background	LOS	C	F	F	F	A	B	B	B	C	C	C	C	C	C	C	C	F
				Delay	21	175	175	147	10	15	15	15	25	25	25	25	30	26	26	28	83
				V/C	0.79	1.33	1.33		0.04	0.62	0.62		0.04	0.04	0.04		0.56	0.17	0.17		
				Q	45	375	375		2	91	91		6	6	6		41	17	17		
		TCS	2029 Total	LOS	C	F	F	F	A	B	B	B	C	C	C	C	C	C	C	C	F
				Delay	23	179	179	152	10	15	15	15	25	25	25	25	30	26	26	28	85
				V/C	0.81	1.34	1.34		0.04	0.63	0.63		0.04	0.04	0.04		0.56	0.17	0.17		
				Q	47	378	378		2	94	94		6	6	6		42	17	17		
	2. Lakeshore Road at Pearl Street	TCS	Base Year	LOS	A	A	A	A	A	A	A	A	D	D	D	D	D	D	D	D	A
				Delay	2	5	5	5	0	0	0	0	44	44	44	44	43	42	42	42	5
				V/C	0.07	0.74	0.71		0.00	0.22	0.22		0.01	0.01	0.01		0.12	0.04	0.04		
				Q	3	114	114		0	15	15		2	2	2		7	11	11		
		TCS	2029 Background	LOS	A	B	B	B	A	A	A	A	D	D	D	D	D	D	D	D	A
				Delay	2	13	13	12	2	2	2	2	44	44	44	44	42	41	41	41	10
				V/C	0.10	0.89	0.89		0.00	0.32	0.32		0.27	0.27	0.27		0.17	0.05	0.05		
				Q	4	308	308		0	24	24		11	11	11		9	12	12		
		TCS	2029 Total	LOS	A	B	B	B	A	A	A	A	D	D	D	D	D	D	D	D	B
				Delay	2	16	16	16	2	3	3	3	42	42	42	42	40	39	39	40	12
				V/C	0.10	0.91	0.91		0.01	0.33	0.33		0.44	0.44	0.44		0.14	0.06	0.06		
				Q	5	332	332		1	30	30		19	19	19		9	12	12		
	3. Lakeshore Road at Martha Street	TWSC	Base Year	LOS	A	A		A		A	A	A					C		C	C	
				Delay	9	0		1		0	0	0					17		17	17	
				V/C	0.11	0.50				0.34	0.34						0.10		0.10		
				Q	3	0				0	0						3		3		
		TWSC	2029 Background	LOS	A	A		A		A	A	A					F		F	E	
				Delay	10	0		1		0	0	0					69		69	43	
				V/C	0.16	0.63				0.44	0.44						0.71		0.71		
				Q	5	0				0	0						34		34		
		TWSC	2029 Total	LOS	A	A		A		A	A	A					F		F	F	
				Delay	10	0		1		0	0	0					70		70	70	
				V/C	0.16	0.63				0.44	0.44						0.71		0.71		
				Q	5	0				0	0						34		34		
	4. Lakeshore Road at Old Lakeshore Road	TWSC	Base Year	LOS		A	A	A	A	A		A	C		C	C					
				Delay		0	0	0	10	0		0	16		16	16					
				V/C		0.51	0.51		0.02	0.34			0.04		0.04						
				Q		0	0		0	0			1		1						
		TWSC	2029 Background	LOS		A	A	A	C	A		A	C		C	C					
				Delay		0	0	0	16	0		0	24		24	24					
				V/C		0.69	0.69		0.05	0.45			0.07		0.07						
				Q		0	0		1	0			2		2						
		TWSC	2029 Total	LOS		A	A	A	C	A		A	D		D	D					
				Delay		0	0	0	16	0		0	25		25	25					
				V/C		0.69	0.69		0.07	0.45			0.13		0.13						
				Q		0	0		2	0			4		4						
	5. Old Lakeshore Road at Driveway A	TWSC	2028 Total	LOS	A	A		A		A	A	A					A		A	A	
				Delay	3	3		3		0	0	0					9		9	9	
				V/C	0.01	0.01				0.03	0.03						0.04		0.04		
				Q	0	0				0	0						1		1		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
Q - 95th Percentile Queue Length
V/C - Volume to Capacity Ratio

TABLE 5.2B: INTERSECTION CAPACITY ANALYSIS – (PM PEAK HOUR)

Analysis Period	Intersection	Control Type	Horizon	MOE	Direction / Movement / Approach																
					Eastbound				Westbound				Northbound				Southbound				
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Overall
PM Peak Hour	1. Lakeshore Road at Brant Street	TCS	Base Year	LOS	B	B	B	**B**	A	B	B	**B**	C	C	C	**C**	D	D	D	**D**	**B**
				Delay	11	16	16	**15**	7	13	13	**13**	34	34	34	**34**	38	42	42	**41**	**18**
				V/C	0.56	0.69	0.69		0.01	0.62	0.62		0.06	0.06	0.06		0.47	0.61	0.61		
				Q	22	180	180		2	129	129		7	7	7		36	56	56		
		TCS	2029 Background	LOS	F	D	D	**F**	B	C	C	**C**	C	C	C	**C**	D	D	D	**D**	**D**
				Delay	213	53	53	**87**	12	27	27	**27**	31	31	31	**31**	44	54	54	**51**	**53**
				V/C	1.34	1.00	1.00		0.04	0.86	0.86		0.05	0.05	0.05		0.70	0.84	0.84		
				Q	116	330	330		2	211	211		8	8	8		76	118	118		
		TCS	2029 Total	LOS	F	E	E	**F**	B	C	C	**C**	C	C	C	**C**	D	D	D	**D**	**D**
				Delay	223	57	57	**92**	13	28	28	**28**	31	31	31	**31**	45	54	54	**51**	**54**
				V/C	1.36	1.01	1.01		0.05	0.87	0.87		0.05	0.05	0.05		0.72	0.84	0.84		
				Q	118	338	338		2	221	221		8	8	8		78	118	118		
	2. Lakeshore Road at Pearl Street	TCS	Base Year	LOS	A	A	A	**A**	A	A	A	**A**	D	D	D	**D**	D	D	D	**D**	**A**
				Delay	2	3	3	**3**	1	2	2	**2**	48	48	48	**48**	47	46	46	**46**	**5**
				V/C	0.09	0.48	0.48		0.01	0.33	0.33		0.28	0.28	0.28		0.18	0.07	0.07		
				Q	4	53	53		1	26	26		15	15	15		12	13	13		
		TCS	2029 Background	LOS	A	A	A	**A**	A	A	A	**A**	D	D	D	**D**	D	D	D	**D**	**A**
				Delay	2	5	5	**5**	2	3	3	**3**	47	47	47	**47**	47	44	44	**45**	**7**
				V/C	0.14	0.70	0.70		0.02	0.43	0.43		0.42	0.42	0.42		0.35	0.07	0.07		
				Q	5	140	140		1	45	45		20	20	20		19	14	14		
		TCS	2029 Total	LOS	A	A	A	**A**	A	A	A	**A**	D	D	D	**D**	D	D	D	**D**	**A**
				Delay	2	7	7	**6**	2	4	4	**3**	48	48	48	**48**	46	43	43	**44**	**8**
				V/C	0.15	0.73	0.73		0.03	0.44	0.44		0.53	0.53	0.53		0.31	0.10	0.10		
				Q	6	175	175		2	53	53		28	28	28		19	15	15		
	3. Lakeshore Road at Martha Street	TWSC	Base Year	LOS	A	A		**A**		A	A	**A**					C		C	**C**	
				Delay	10	0		**1**		0	0	**0**					18		18	**18**	
				V/C	0.07	0.38				0.53	0.53						0.08		0.08		
				Q	2	0				0	0						2		2		
		TWSC	2029 Background	LOS	B	A		**A**		A	A	**A**					D		D	**D**	
				Delay	12	0		**1**		0	0	**0**					30		30	**30**	
				V/C	0.18	0.51				0.68	0.68						0.32		0.32		
				Q	5	0				0	0						11		11		
		TWSC	2029 Total	LOS	B	B		**A**		A	A	**A**					D		D	**D**	
				Delay	12	12		**1**		0	0	**0**					30		30	**30**	
				V/C	0.18	0.51				0.67	0.67						0.33		0.33		
				Q	5	0				0	0						11		11		
	4. Lakeshore Road at Old Lakeshore Road	TWSC	Base Year	LOS		A	A	**A**	A	A		**A**	C		C	**C**					
				Delay		0	0	**0**	9	0		**0**	15		15	**15**					
				V/C		0.38	0.38		0.02	0.52			0.07		0.07						
				Q		0	0		0	0			2		2						
		TWSC	2029 Background	LOS		A	A	**A**	B	A		**A**	C		C	**C**					
				Delay		0	0	**0**	11	0		**0**	19		19	**19**					
				V/C		0.53	0.53		0.03	0.69			0.11		0.11						
				Q		0	0		1	0			3		3						
		TWSC	2029 Total	LOS		A	A	**A**	B	A		**A**	C		C	**C**					
				Delay		0	0	**0**	11	0		**0**	20		20	**20**					
				V/C		0.53	0.53		0.05	0.69			0.14		0.14						
				Q		0	0		2	0			4		4						
	5. Old Lakeshore Road at Driveway A	TWSC	2028 Total	LOS	A	A		**A**		A	A	**A**					A		A	**A**	
				Delay	4	4		**4**		0	0	**0**					9		9	**9**	
				V/C	0.02	0.02				0.03	0.03						0.04		0.04		
				Q	0	0				0	0						1		1		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
Q - 95th Percentile Queue Length
V/C - Volume to Capacity Ratio

5.3 Sight Distance Evaluation

Sight distance analysis, in conformance with guidelines of the Transportation Association of Canada Geometric Design Guide for Canadian Roads (TAC-GDGCR)[12] was performed along Old Lakeshore Road at Driveway A. The posted speed on Old Lakeshore Road is assumed to be 50 km/h, thus a design speed of 60 km//h has been used to calculate the required sight distance for traffic approaching the proposed Driveway.

Stopping Sight Distance is the distance required for a vehicle approaching an intersection from either direction 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 visibility criterion for the safe operation of an unsignalized intersection. TAC-GDGCR outlines for a design speed of 60 km/h, 85 metres is required.

Driveway A has more than adequate sight distance to the west to meet the stopping sight distance criteria. To the east of Driveway, A; Old Lakeshore Road terminates at Lakeshore Road. This section with unobstructed sight lines in 75 metres in length. Given the short segment length to the stop-controlled intersection with Lakeshore Road, sight distance to the east of Driveway A is noted to be adequate based on the following:

- Vehicles entering the site from the east will be doing so from a right turn manoeuvre. Right turn manoeuvres are generally made more efficiently than left turn movements, thus the presence of a stopped vehicle is unlikely to occur.
- Vehicles travelling from the east along Old Lakeshore Road through the curve will be negotiating the turn at a lower speed than the posted speed limit. The available stopping sight distance is sufficient for a design speed of 50 kilometres per hour which requires 60 metres;

Overall, as Old Lakeshore Road southwest of Lakeshore Road can be considered to be non-ideal roadway geometrics, drivers will ultimately adjust their speeds to the physical limitations and the prevailing traffic conditions[13]. As a result, the speeds through the horizontal curvature are expected to be in line and even less that the posted speed limit which provides for sufficient decision and turning sight distance.

[12] Transportation Association of Canada Geometric Design Guide for Canadian Roads, 2017
[13] Transportation Association of Canada, Geometric Design Guide for Canadian Road, Updated December 20017, Section 1.2.3.3

5.4 Queue Assessment

SimTraffic was utilized rather than Synchro in this assessment as microscopic models, such as Sim Traffic, individually track each vehicle in the traffic system through the model and collect comprehensive operational measures of effectiveness for every vehicle during each 0.1 second of the simulation. Unlike Synchro, SimTraffic measures the full impact of queuing and blocking. Synchro is best used to determine level of service and delay at the macro level but is not ideal for assessments simulating real-world conditions.

The analysis consisted of ten (10) iterations of sixty (60) minute simulations to forecast the delay per vehicle in seconds. **Appendix F** provides the SimTraffic results. The following sub-sections discusses the queue assessment.

5.4.1 Site Driveway Blockage

Approximately 70 metres of queue storage from Driveway A to the northbound stop bar at Old Lakeshore Road and Lakeshore Road is available. Reviewing the SimTraffic results indicates that during the respective peak hours, the 95th percentile queue length of 14 metres is expected for the northbound approach at Old Lakeshore Road and Lakeshore Road. Driveway A is not anticipated to encounter vehicle blockages.

5.4.2 Lakeshore Road and Old Lakeshore Road

The intersection of Lakeshore Road and Old Lakeshore Road presently has 40 metres of storage for the westbound left turn lane. A review of the SimTraffic results indicates the 95th percentile queue length for the westbound left turn lane is projected to be 12 metres. Overall, the present storage is sufficient to accommodate the future left turn requirements based on the analysis contained herein.

6 Proposed Mitigation Measures

As summarized in the analysis tables in the previous chapter, a single study area intersection is projected to experience, operational deficiencies independent of the development. The analysis also concludes that the development would have minimal impacts on traffic conditions in the study area. Regardless, the Applicant intends to advance improvements at these study area intersections through the City's Development Charge program to help ensure that development traffic does not adversely affect the study area.

This chapter includes a summary of potential improvement measures that have been identified to address the limited impacts of the development and to improve existing deficiencies.

6.1 Intersection / Roadway Mitigation

As summarized in the analysis tables in the previous chapter, a single study area intersection is projected to experience, operational deficiencies independent of the development. The analysis also concludes that the development would have minimal impacts on traffic conditions in the study area

6.1.1 Lakeshore Road and Brant Street

The intersection of Lakeshore Road and Brant Street presently operates with high delays during peak hour periods. Development impacts at this location are minor.

The development is not expected to have any significant impact on operations at this intersection as development related traffic has a negligible volume increase (i.e. less 1%) to the critical movement during the weekday peak hours.

As a general guideline, the lane capacity of an arterial lane is about 900 vehicles per hour. The peak hour, peak direction base year traffic volumes indicates volumes exceeding 900 vehicles per hour along Lakeshore Road in the eastbound direction which exceeds the capacity of single lane. With background traffic growth accounted for, this volume is expected to increase to well over 1,000 vehicles per hour.

Widening existing roads or building new ones, in most circumstances, will encroach on private property, impact mature trees and green space or compromise the existing public realm (e.g. sidewalks, boulevards). A more sustainable transportation strategy is to move more people per kilometre by walking, cycling and transit or in combination with high occupancy vehicles. It is generally acknowledged that the future travel needs of Burlington residents and workers cannot be met solely by improving the road system alone as echoed in the Region's Transportation Master Plan.

Burlington's current Capital Projects Plan does not indicate any roadway improvements to the Lakeshore Road within the study area. Due to the high levels of congestion occurring today at the intersection and the expected future growth in population and employment for Burlington, remedial measures to improve intersection capacity are not likely to be implemented. Rather, future improvements to the transportation network are expected to largely focus on public transit infrastructure.

The basic goal of future transit planning is to create a network that will serve all segments of Burlington and more importantly Halton Region. It is anticipated that the future transit network will be largely based on mobility hubs, and particular, the Anchor Mobility Hub proposed at the Downtown Terminal. The mobility hub concept is an important aspect to the overall transit plan as it provides residents and works as a centralized location that has several transportation options and is a concentrated point for a mix of uses such as transit, employment, housing, recreation and shopping.

By focusing on shifting commuter travel to public transit, intersection operations could be expected to maintain the status quo (capacity conditions during peak hours) or to possibly improve if fewer vehicles traverse the intersections during the peak hours of a typical weekday. It is also worthwhile to note that increased traffic congestion encourages drivers to consider other modes of transportation. The City's OP[14] states that,

> *"At some locations, such as Mixed-Use Intensification Areas and Areas of Employment, increased tolerance for at-capacity conditions."*

To accommodate future travel to, from, and within the downtown, a full-spectrum multi-modal transportation system is required. However, until improvements to the multi-modal system is established, and a greater portion of the population utilizes transit to a greater degree, 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 with optimized signal timings and indicates 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 G** contains the detailed Synchro reports and signal timings.

[14] Burlington Official Plan, Adopted on April 26, 2018.

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 at Brant Street	TCS	2029 Total	LOS	C	F	F	**F**	A	B	B	**B**	C	C	C	**C**	C	C	C	**C**	**F**
				Delay	23	179	179	**152**	10	15	15	**15**	25	25	25	**25**	30	26	26	**28**	**85**
				V/C	0.81	1.34	1.34		0.04	0.63	0.63		0.04	0.04	0.04		0.56	0.17	0.17		
				Q	47	378	378		2	94	94		6	6	6		42	17	17		
		TCS	2029 Total (Optimized)	LOS	C	D	D	**D**	A	B	B	**B**	D	D	D	**D**	E	D	D	**E**	**D**
				Delay	21	54	54	**48**	8	11	11	**11**	50	50	50	**50**	68	52	52	**58**	**36**
				V/C	0.77	1.02	1.02		0.04	0.49	0.49		0.05	0.05	0.05		0.72	0.17	0.17		
				Q	43	515	515		2	97	97		10	10	10		73	25	25		
PM Peak Hour	Lakeshore Road at Brant Street	TCS	2029 Total	LOS	F	E	E	**F**	B	C	C	**C**	C	C	C	**C**	D	D	D	**D**	**D**
				Delay	223	57	57	**92**	13	28	28	**28**	31	31	31	**31**	45	54	54	**51**	**54**
				V/C	1.36	1.01	1.01		0.05	0.87	0.87		0.05	0.05	0.05		0.72	0.84	0.84		
				Q	118	338	338		2	221	221		8	8	8		78	118	118		
		TCS	2029 Total (Optimized)	LOS	E	D	D	**E**	B	C	C	**C**	D	D	D	**D**	E	E	E	**E**	**D**
				Delay	77	54	54	**59**	14	30	30	**30**	42	42	42	**42**	73	66	66	**68**	**47**
				V/C	0.94	0.98	0.98		0.04	0.85	0.85		0.07	0.07	0.07		0.85	0.82	0.82		
				Q	103	369	369		2	227	227		10	10	10		107	122	122		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
Q - 95th Percentile Queue Length
V/C - Volume to Capacity Ratio

6.1.2 Lakeshore Road and Martha Street

The intersection of Lakeshore Road and Martha Street is projected to operate with increased delay for the stop controlled southbound approach during the Weekday AM peak hour. The development is not expected to have any significant impact on operations at this intersection as development related traffic has a negligible volume increase (i.e. less 1%) to the critical movement during the weekday peak hours.

Consideration for signals at this intersection is not recommended as there is reduced spacing (120 metres centreline to centreline) between the existing signalized intersection of Lakeshore Road and Pearl Street. The minimum spacing prescribed by the Ontario Traffic Manual, which is the Provincial standard applying to traffic signals, is 215 meres.

The most feasible improvement option to the intersection would be to restrict southbound left turns during the weekday AM peak hour from Monday to Friday. This would reduce the amount of delay significantly. The restricted vehicles would most likely re-route north to travel east along New Street.

6.2 Left Turn Lanes

The proposed driveway connection to Old Lakeshore Road was assessed to determine if the future traffic volumes warrant installation of a left turn lane along the major roadway.

The warrants for left-turn lanes follow the requirements in the Ministry of Transportation's (MTO) Geometric Design Standards[15]. A design speed of 10 kilometres per hour over the posted speed limit has been utilized. The percentages of left-turning vehicles in the approaching volume were rounded to the nearest 5 percent, as nomographs are only provided for 5 percent increments. **Table 6.2** summarizes the results of the left-turn lane warrant analyses. The following is noted:

- An eastbound left turn lane along Old Lakeshore Road at Driveway A is not warranted.

TABLE 6.2: LEFT-TURN LANE ANALYSIS

	Old Lakeshore Road at Driveway A	
Approach Direction Design Speed	Eastbound 60 km/h	
Horizon	2029 Total	
Peak Hour	AM	PM
Advancing Volume	22	53
Opposing Volumes	50	45
Left Turning Traffic	10	25
% of Left Turning Traffic	45.5%	47.2%
Figure Used*	9A-9	9A-9
Warranted	**No**	**No**
Storage Length Required	n/a	n/a

Based on MTO Design Supplement for TAC Geometric Design Guide for Canadian Road - June 2017

6.3 Right of Way (ROW)

According to the analysis contained herein, there are no current or projected capacity deficiencies along Lakeshore Road adjacent to the proposed development. Additionally, no increases in storage requirement for auxiliary turn lanes along the Lakeshore Road corridor between Martha Street and Old Lakeshore Road is required.

Therefore, there is no need for widening of the ROW along Lakeshore Road along the development's frontage required for capacity reasons.

[15] MTO Design Supplement for TAC Geometric Design Guide for Canadian Road, 2017

7 Parking Review

7.1 Zoning By-Law Requirements

7.1.1 Vehicle Parking

Zoning By-law 2020 is the current in-force By-law for the City of Burlington. The requirements stipulated in the Zoning By-law are outlined in **Appendix H.** Based on the City Zoning By-law, the subject site is within the Defined Parking Area which exempts all non-residential properties from providing on-site parking.

The minimum parking rates for the proposed development are as follows:

- Apartment Dwelling Units: 1.25 spaces per unit.

Table 7.1 summarizes Zoning By-law 2020 minimum parking standard calculations for the development.

TABLE 7.1: EXISTING ZONING REQUIREMENTS

Use	Units	Parking Rate[a]	Spaces Required
Residential	150	1.25 per unit	187.5
Total Parking Required			**187.5**

a - Zoning By-law 2020 - Downton Defined Area Rates

As indicated, under the City's Zoning By-Law, the proposed development requires 188 parking spaces. The proposed parking supply of 155 spaces (1.03 spaces per unit) results in a reduction of 33 spaces.

7.1.2 Bicycle Parking

The City's Zoning By-Law stipulates the development be required to provide bicycle parking for the retail component only. The minimum bicycle parking rates are as follows:

- Two spaces plus one space per 1,000 m^2 GFA

Based on this requirement, the development is required to provide a total of 3 bicycle parking spaces, preferably at street level. The development is proposing to supply 24 ground level bicycle spaces meeting the Zoning By-law requirements as well as an additional 55 bicycle parking spaces for residential use.

7.1.3 Burlington City-Wide Parking Standards Review

IBI Group conducted a City-Wide Parking Standards Review (CWPSR) for the City of Burlington in July 2017[16] that reviewed the "Parking Requirements" contained within By-law 2020. This review provided detailed recommendations on how the requirements should be modified to better reflect the transportation and land use realities and objectives across Burlington.

As Zoning-By law 2020 is still in effect and does not require any visitor requirements, a review of the residential component has been compared. The rates in the CWPSR considers a minimum of 1.00 space per unit for residents be provided in intensification areas such as the downtown. Applying the recommended rate to the development, 150 parking spaces would be required, meeting the proposed residential supply.

The current zoning for residential requirements in the Downton Exemption Area is significantly higher than what the CWPSR proposes. A parking rate of 1.00 space per unit is sufficient to accommodate the residential requirements.

7.2 Official Plan

The criteria provided in the By-law 2020, particularly with minimum parking requirements should have some flexibility with granting a lower parking obligation to reflect the policies set out in Burlington's Official Plan (OP) [17] which states:

Policy 8.1.(2) f)

> *"Transportation demand management (TDM) measures shall be addressed, and form part of the City's evaluation of opportunities for reduced parking standards in proposed development within mobility hubs."*

Policy 6.2.1(1) k)

> *"To implement a range of transportation demand management (TDM) strategies to reduce single-occupancy vehicle trips, to encourage more frequent travel by sustainable modes and outside of peak periods."*

[16] Final Report Burlington City-Wide Parking Standards Review Consolidated Report, IBI Group, July 2017

[17] Burlington Official Plan, Adopted on April 26, 2018.



Policy 6.2.1(1) l)

> *"To recognize parking management as a tool to influence mode choice, affect housing costs and shape the public realm."*

Policy 8.1.1.(3.11)

> *"Development will support and enhance the Downtown as a lively, vibrant and people-oriented place and support the Downtown's role as a major transit station area and mobility hub within the city and region."*

The manner in which intensification within the urban growth centre can be accommodated is contemplated in a number of Policies within the OP. There is a strong focus on the pedestrian environment and an emphasis on active transportation and transit.

As the development proposal places a focus on accommodating a suitable pedestrian environment, one that would encourage active transportation based on the de-emphasis on parking, the site's location relative to employment, retail, and recreational opportunities, along with a design emphasis on-street activity is consistent with the goals set out in the OP.

As the OP is a guiding document, it is important to look at the future requirements as opposed to the past requirements to maintain and implement the policies developed and to provide a paradigm shift in encouraging residents of the development as well as citizens to consider sustainable mode choices.

Currently in the Downtown urban growth centre, restaurants, drinking establishments and theaters do not require parking (though they may choose to provide it). Consideration to expanding the list of uses to include other land use types to provide flexibility and to encourage sustainable travel modes is encouraged. Since the Downtown is the best-served multi—modal location in Burlington, it makes sense to give new developments this level of flexibility.

The proposed development will create and support a better environment for walking, cycling and transit use by improving the pedestrian environment, and adding density to the Downtown. Moreover, residents of the proposed development will be a short walking distance from the existing amenities of the Downtown, while at the same time creating new amenities at grade along the street fronts.



7.3 Mobility Hub

The Big Move is the regional transportation plan (RTP) published by Metrolinx for the Greater Toronto and Hamilton Area (GTHA). It makes specific recommendations for transit projects. Since its publication, it has been Metrolinx mandate to implement the RTP, which includes new and improved GO Transit service, local rapid transit, stations, and fare payment systems.

The City's four designated Mobility Hubs include the Burlington GO Station, Downtown Burlington (Anchor Mobility Hub), Appleby GO Station, and Aldershot GO Station. All four areas designated as "Mobility Hubs" encompass an approximately 800 metre radii around the transit station. Downtown Burlington's Mobility Hub is planned to integrate rapid transit, regional transit, and local transit.

Anchor hubs are primary major transit stations in an urban growth centre. These Anchor hubs have strategic importance due to their relationship with urban growth centres and/or their role as major international gateways. Anchor hubs contain current or planned major regional destinations and they have significant potential to attract and accommodate new growth and development. These hubs have the potential to transform the regional urban structure and act as anchors of the regional transportation system.

Burlington envisions a significant increase in density at each of the four designated Mobility Hubs particularly in the downtown and a shift to compact, higher density, more intense mixed-use developments is encouraged through the revitalization of these areas. The Mobility Hubs are to place emphasis on modes of transportation, including walking, cycling, and transit. Preliminary estimates from the Regional Transportation Plan (RTP) carried out by Metrolinx indicates the Downtown Burlington Anchor Hub is projected to carry 2,800 transit passengers and serve up to 25,000 people and job within an 800-metre radius of the Anchor Hub.

The Big Move has developed strategies that will contribute to the transformation of the GTHA transportation system. One of these strategies focuses on building communities that are pedestrian, cycling, and transit-How we design our communities is a major factor in determining how we choose to travel. People who live in a higher density neighborhood with a variety of stores and services near their home are more likely to walk, cycle or take transit. Lower density area's that are far from shops and services, and lacks sidewalks and bike lanes are much more likely to drive[18].

[18] The Big Move, Metrolinx, November 2008

The City's transportation system and land use development are intended to achieve the following minimum transit modal shares when "mature-state" of urban development is reached:

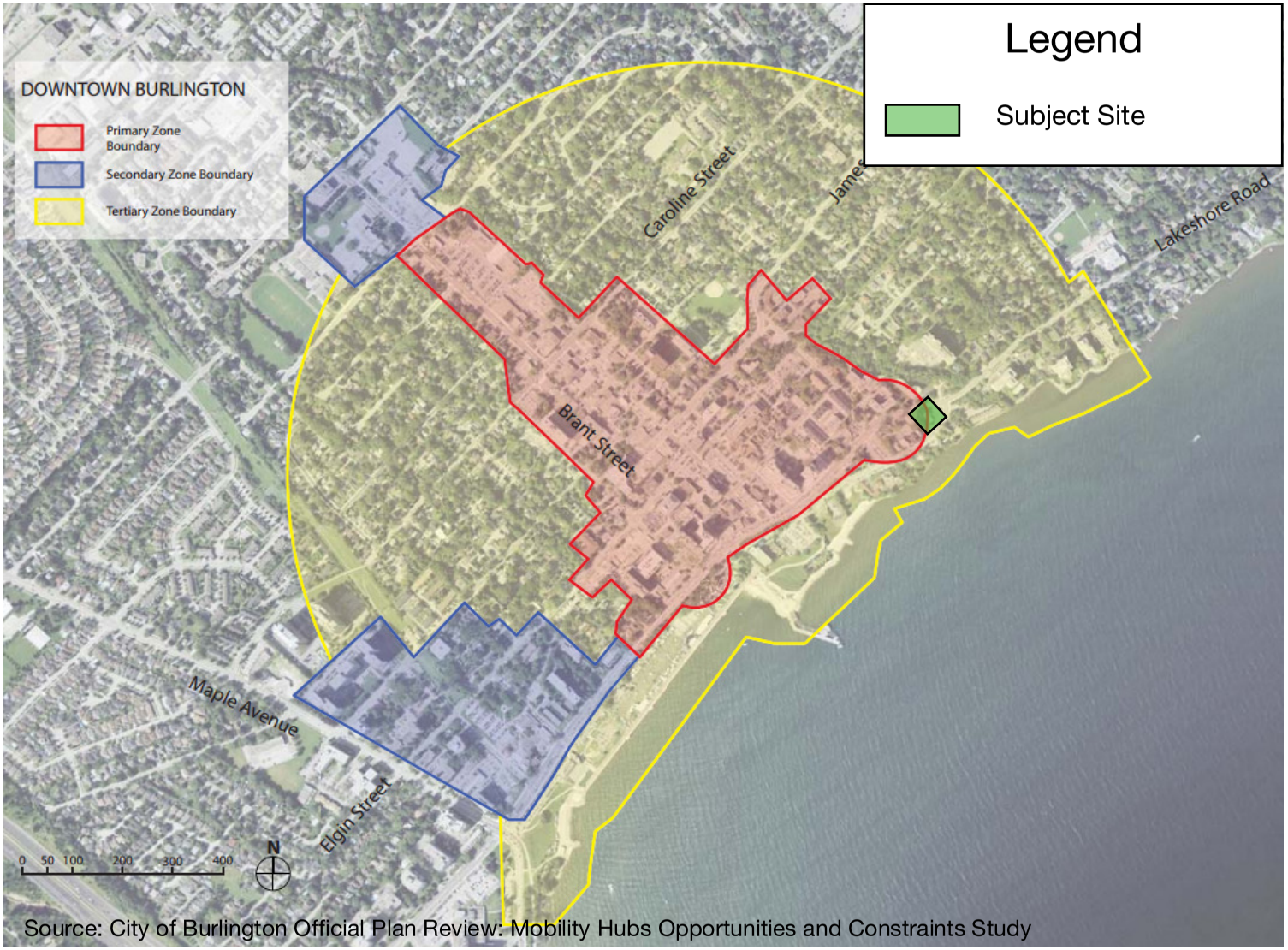
- 15 percent of all trips within Burlington by transit;
- 30 percent of all eastbound trips leaving the City by transit; and
- 10 percent of all westbound trips leaving the City by transit[19].

Based on this projected shift, the demand for automobile parking is also expected to decrease. To contribute to the shift from automobile trips to other modes, reduced parking requirements in and around Mobility Hubs will help contribute to meeting the City's transit modal share targets.

Transit-oriented development does much more than just shift automobile trips to transit. People who live or work in communities with high-quality public transit tend to own fewer automobiles and drive fewer annual miles than they otherwise would. Given the proximity of the subject property to local transit service within and a future Mobility Hub, the reduced parking rate is consistent with the policies set out in the OP. These policies support reduced parking standards in Mixed-Use Activity Areas to encourage the use of alternative forms of transportation including transit, walking and cycling.

Figure 7.1 illustrates the location of the Downtown Mobility Hub in relation to the development.

[19] Discussion Paper 1 – Current State of Transportation in Burlington, Prepared by City of Burlington, June 2014



Downtown Mobility Hub (Anchor Mobility Hub) Location

7.4 Travel Characteristics

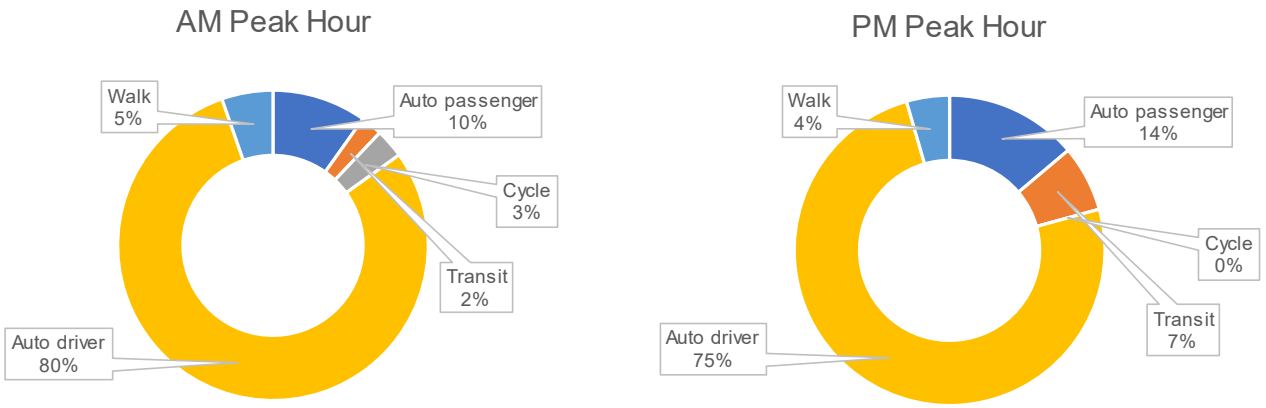
A review of travel characteristics provided by the 2016 Transportation Tomorrow Survey (TTS) for residents living in the area surrounding the site confirms that a significant proportion of travel undertaken during the morning and afternoon peak periods is by non-auto means.

Information provided by the TTS program for the site area (GTA 2006 Zone 4060) suggests that the proportion of people who choose to drive (including drivers and motorcycles) in the area during the morning and afternoon peak weekday periods is on average 78%. The balance of travel is undertaken as passengers in a car (12%), using transit (5%) or by bicycle/walking (5%).

Based on this data it is reasonable to assume that only 80% of unit owners would require the use of an automobile for everyday travel whereas the remainder of the trips are fulfilled through transit and active modes.

Chart 7.2 outlines the 2016 peak period commuting trip characteristics within the study area.

CHART 7.2: COMMUTING TRIPS IN STUDY AREA



With the development located adjacent to a future Mobility Hub, it is expected that the subject development will further attract residents and visitors that will utilize transit as a primary mode choice for commuting with limited reliance on utilizing or even owning a vehicle. This will create less demand for vehicle parking requirements; including visitor demand.

7.5 Visitor Parking Supply

The current requirements for visitor parking in the Zoning By-law requires no spaces to be provided. By providing limited parking on-site, the development provides a further incentive to change and shape the travel choices of visitors to the development.

In the event that visitors are unable to use sustainable mode choices, there are on-street parking and metred spaces along Old Lakeshore Road visitors can utilize as the purpose of these spaces is to provide short-stay parking.

7.6 Parking Rates

Encouraging compact communities, sustainable transportation choices, and housing affordability are well-established objectives. However, parking is at the centre of these objectives. Given that high-density represents a large portion of new housing starts in the downtown area and will remain so over the long term as the population grows, having current and efficient parking requirements are critical to the achievement of a sustainable region and livable neighbourhoods.

The amount of parking required in new high-density developments should reflect current and emerging trends. Transit ridership continues to increase year after year, in part from improved transit service levels as well as future network improvements such as the proposed Downtown Mobility Hub.

A review of actual parking demands that are likely to be generated by the proposed development has been considered to assess, independent and separate from a review of Zoning By-Law requirements.

The “real” demands established are based upon a review of parking demand technical resources and information collected by Paradigm and others at comparable land uses. The established demands consider a number of influencing factors that are in-play including market demands and the effects of interaction between uses.

7.6.1 ITE

There are numerous industry associations and institutions that are dedicated to the survey and review of parking requirements related to various land uses. These associations, such as the Institute of Transportation Engineers (ITE), collect, review and disseminate information related to parking demand, supply, and appropriate design standards. This data is useful in establishing a typical range of requirements. In addition to industry standard rates, a review of local parking demand was undertaken to determine if the proposed supply is representative of demand at similar sites.

ITE produces a periodic report titled Parking Generation, which is the prevailing national standard in determining parking demand for a development. ITE standards are based on parking demand studies



submitted to ITE by a variety of parties, including public agencies, developers and consulting firms. The most recent parking generation manual available is the 5th edition[20] and is a comparative starting point to determine baseline assumptions.

This study includes ITE peak period parking demand rates as guidelines to benchmark how the proposed supply compares to Multi-Family (High-Rise) developments. The following ITE Land Use Code (LUC) was reviewed:

- LUC 222 – Multi-family Housing (High-Rise): High-rise multifamily housing includes apartments and condominiums that have more than 10 levels (floors) of residence. They are likely to have one or more elevators. The weekday peak parking demand ratio is 0.98 per dwelling unit (residential and visitor demand).

7.6.2 Local Parking Surveys

To better understand the actual parking demand that can be expected for a development of this type, a parking utilization survey was reviewed at two different sites with similar land uses to the proposed development with the City of Burlington.

Available information about each site, such as the number of units, walking distance to the Downtown Bus Terminal, peak parking demand and demand rates is outlined in **Table 7.3**. Parking surveys are provided in **Appendix I**.

TABLE 7.3: RESIDENTIAL PARKING SURVEY RESULTS

Municipality	Address	Distance to Bus Terminal	Number of Storeys	Number of Units	Type	Demand	
						Peak Parking Demand	Rater Per Unit
Burlington	360 Pearl	0.3 km	17	75	Resident	57	0.76
					Visitor	10	0.13
					Total	**67**	**0.89**
Burlington	551 Maple Avenue	1.2 km	21	186	Resident	149	0.80
					Visitor	36	0.19
					Total	**185**	**0.99**

It should be noted that the proposed development is located within 0.4 km of the Downtown Bus Terminal and is within a similar distance as the residential sites surveyed.

Parking demand rates ranged from 0.76 to 0.80 spaces per unit, which indicates high-rise developments within the City of Burlington generally generate less than 1.00 parking space per unit to meet residential and visitor demand. **Chart 7.4 – 7.5** outlines the parking demand trend of the surveyed sites

[20] ITE Parking Generation 5th Edition, Washington DC, 2019.

CHART 7.4: 360 PEARL STREET PARKING DEMAND TREND

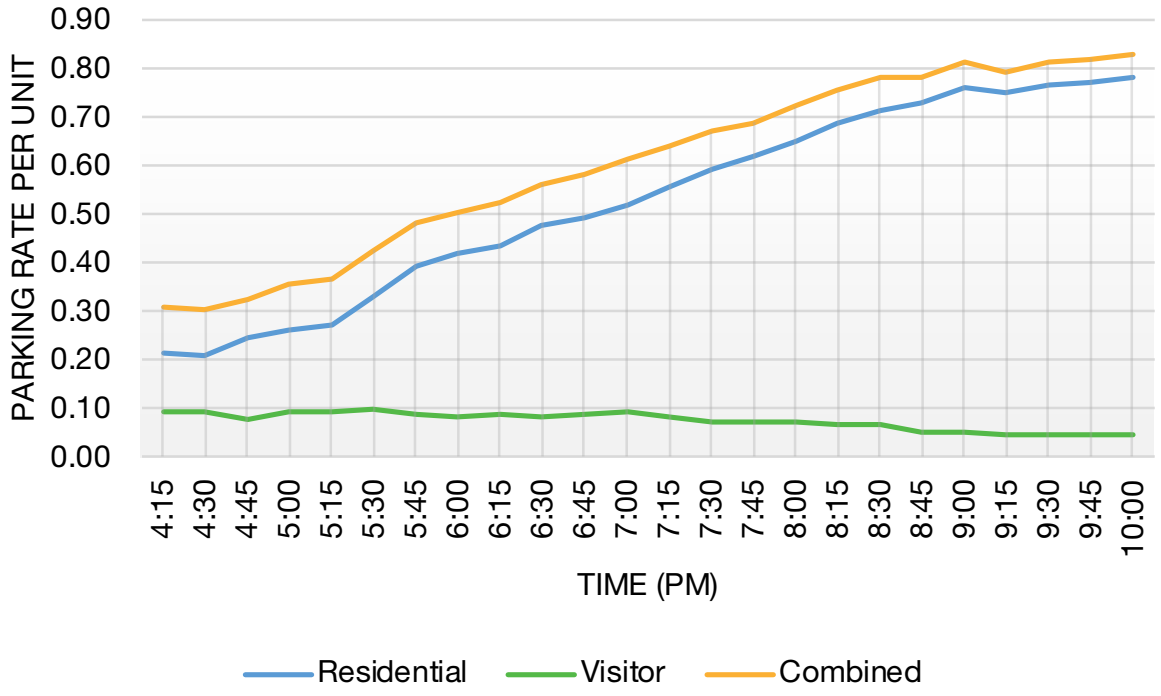
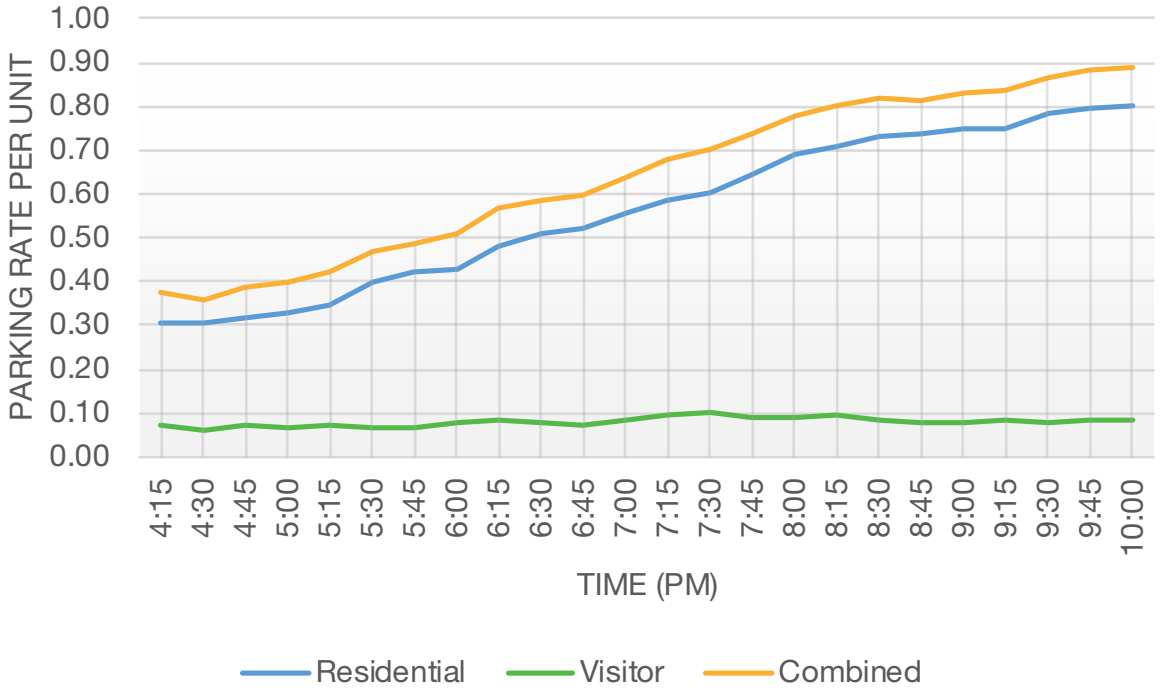


CHART 7.5: 551 MAPLE AVENUE PARKING DEMAND TREND



7.7 Parking Demand

A summary of the peak parking demand expected for the proposed development based on the rates provided within ITE and the local rates observed is provided in **Table 7.6**. The following summarizes the parking demand rates utilized:

- The ITE parking demand rates suggest that high-rise sites were observed with a peak parking demand of 0.98 spaces per unit (resident and visitor).
- The surveyed parking demand suggested that high-rise sites within the City of Burlington observed a peak parking demand of 0.99 spaces per unit (resident and visitor).

The projected demand is forecast to be in the order of 149 spaces.

TABLE 7.6: PROJECTED PARKING DEMAND

Methodology	Units	Parking Rate	Projected Demand
ITE Parking Demand	150	0.98 spaces per unit	147.0
Proxy Parking Demand	150	0.99 spaces per unit	148.5

The projected demand indicates the “real” demand for a Multi-Family (High-Rise) development is considerably lower than the parking requirements outlined by the City’s Zoning By-Law and the CWPSR. The development proposes a parking supply of 155 spaces that is in excess of the projected demand.

7.8 Provincial Policy Statement

The Provincial Policy Statement 2014 (PPS 2014)[21] is a broad policy document that applies Province-wide. The plan is made up of several plans that cover geographic areas. In this case, the Growth Plan for the Greater Golden Horseshoe 2017 (GGH 2017)[22] applies to the proposed development.

Both these plans emphasize transit use and intensification as part of their overall mandate on complete communities, environmental sustainability, healthy lifestyles and the importance of providing a full range of housing opportunities for a diverse population.

As the development is located within an Anchor Mobility Hub, such hubs have strategic importance for their relationship to urban growth centres; intended to be the focus for significant high-density employment and population growth.

[21] Provincial Policy Statement 2014, Ministry of Municipal Affairs and Housing, 2014
[22] Growth Plan for the Greater Golden Horseshoe (2017), Ministry of Municipal Affairs and Housing 2017

As the Province has steadily emphasized, and then required, intensification within settlement areas, the Province has now placed additional importance on supporting transit when considering proposed developments, and as such will need to consider parking reductions.

7.9 Precedent

The Ontario Municipal Board (OMB) decision regarding 374-380 Martha Street; to the northwest of 2107-2119 Old Lakeshore Road, identified that the required parking standard of 1.00 parking spaces per unit is reasonable and fully in keeping with the direction of PPS 2014 and GGH 2017 for developments that emphasize transit use and are transit-supportive.

The OMB's decision of the parking variance for 374 Martha Street serves as precedent in seeking approval of a parking reduction for the proposed development.

As a parking variance of 1.00 spaces per dwelling unit has been deemed appropriate for 374 Martha Street based on the OMB, a reduced parking supply rate of 1.03 spaces per dwelling unit for the proposed development is considered to be supportable based on the previous approval[23].

[23] Ontario Municipal Board, Case No: PL150274, ADI Development Group Inc., 374 Martha Street, Burlington, Ontario, Decision Data February 13, 2018

8 Transportation Demand Management

The goal of Transportation Demand Management (TDM) is to reduce the Project's overall traffic and parking impact through the implementation of strategies that are aimed at affecting the transportation demand rather than the transportation supply (ex. Improving bus service rather than increasing the number of lanes on a road). By their very nature, TDM strategies attempt to change people's behavior, and to be successful, they must rely on incentives or disincentives to encourage the use of alternative modes of travel.

Strategies can also influence when trips are made. For example, alternative work hours (compressed work weeks, flex time, and telecommuting) can affect what time of day trips are made, or if trips occur at all on certain days. On an area-wide basis, the provision of park and ride facilities and transit services can also provide a competitive alternative to drive-alone commuting.

There are several reasons why incorporating TDM into a site is important:

- Reduces auto ownership levels, therefore reducing private vehicle trips and congestion;
- Creates safe and attractive environments that encourage travel by walking, cycling and transit over auto; and
- Supports the development of healthy communities.

The following section outlines potential TDM strategies available to the site to enhance the site's overall convenience, safety and traffic flow by reducing vehicle trips.

8.1 Commitment

The applicant has committed to TDM strategies for the development. It is a significant investment and demonstration of their commitment to meet the City's transportation goals for the site. The applicant recognizes they are part of a larger Burlington community and that the development has significant implications for the future of Burlington.

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 utilize the current and proposed transportation infrastructure. The plan should also be actionable through a set of strategies that are operationally and financially realistic, enabling the plan to be implemented.

It is also important to consider not just the individual strategies, but how they complement each other in a coordinate package. The plan is designed with the understanding that each strategy is needed to maximize trip reductions.



8.1.2 Approach

The applicant is submitting a TDM plan to mitigate potential traffic and parking impacts and minimize trips to and from the development. To provide the most successful implementation, the plan outlines ways in which the applicant can provide a seamless level of service for residents and employees, while supporting large City objectives and policies.

The plan falls into four basic areas that are outlined in the following sections; Multimodal Infrastructure, Management and Marketing, Employee/Resident Strategies and Parking Management.

8.2 Multimodal Infrastructure

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

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.

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

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



8.2.2 Bicycle Facilities

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.

As outlined in **Section 2.2.2**, the City's Cycling Master Plan identifies opportunities for the site to be adequately served by bicycle infrastructure.

A review of the City's Cycling Master Plan has identified Brant Street and Caroline Street as proposed Bicycle Priority Streets, and Elgin Street as a future location for bike lane infrastructure. The Cycling Master Plan has also identified Lakeshore Road east of Brant Street as a future location for bike lane infrastructure. The site has the potential to be well served by bicycle infrastructure.

8.2.3 Secure Bicycle Parking

The City's Zoning By-Law stipulates that the development is required to provide bicycle parking for the retail component only. The minimum bicycle parking rates are as follows:

- 2 spaces plus 1 space per 1,000 m^2 GFA

Based on this requirement, the development is required to provide a total of 3 bicycle parking spaces, preferably at street level.

Commuting by bicycle can be a significant financial investment for many making even a small chance of bicycle theft enough of a reason 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 current cycling mode split for the area is noted to be 1% with walking noted to be 6%. To promote and help in achieving a greater reliance on cycling, the TDM Plan proposes to adopt the following cycling-oriented strategies:

- Provision of 24 ground level bicycle racks located adjacent to the main entrances to provide adequate and secure bicycle parking for visitors;
- Provision of 55 indoor bicycle parking spaces located within the underground parking garage for use by residents;
- Monitor and evaluate cycling use as required with potential to increase bicycle parking based on demand.

With the proposed bicycle parking spaces, residents and commercial staff/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 and thus a reduction in vehicle parking demand.



8.2.4 Transit

The 2016 TTS data identified that 8% of residents within Burlington use transit as a mode of travel. However, the majority of this transit usage is a result of commuters using their automobile to travel to the GO Station rather than using Burlington Transit for the first and last mile trip in Burlington. If residents are favouring an automobile to access regional transit, improvements that make our communities safer, more environmentally friendly and better connected are not realized at the local municipal level.

Creating a transit improvement plan focused on improvements tailored to the needs to improve speed, reliability, comfort and accessibility of transit service is recommended to be undertaken by the Burlington Transit to improve first and last mile trips by local municipal transit use. Some initiatives that could be considered include:

- Expanded service
- New shelters (weather protected waiting and sitting area);
- Improved signage posted route;
- Electronic scheduling information;
- On-street transit priority measures;
- Improved headways;
- Wired Smart bus stations (Wi-Fi, USB ports).

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



8.3 Management and Marketing

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

8.3.1 Transportation Information

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

8.4 Employee and Resident TDM

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

The following strategies are applicable to residential and commercial (sitewide) and, in some cases, commercial only. For each strategy, an explanation is given, as well as a detailed description of what the applicant proposes to provide.

8.4.1 Complete Street (Sitewide)

In the past, non-automotive modes have not been prioritized. Instead, many performance measures of the roadways have focused on moving automobiles. Complete Streets refers to design concepts and principles that focus more specifically on design of the street for all potential users – transit, cyclists, pedestrians and cars.

The proposed development provides several opportunities for increasing accessibility and safety for all modes of transportation and emphasizing modes that are sustainable:

- The front of the building is oriented toward Lakeshore Road;
- The parking lot is located at the back of the development, away from major street frontage of Lakeshore Road; and
- Vehicular access to the development is provided through the minor street network (i.e. Old Lakeshore Road).

By adopting these strategies, the development adheres to the complete streets strategy.



8.4.2 Density (Sitewide)

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

8.4.3 Land-Use Mix (Sitewide)

Having different types of land uses in close proximity can decrease vehicle mode share since trips between land use types are shorter and may be accommodated by non-automotive transportation. The mix of high-density housing and commercial uses provides land use diversity that should reduce the number of automobile trips that residents or employees make.

8.4.4 On-Site Bicycle Repair Facilities (Sitewide)

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 keep bicycles in circulation and maximize bicycle trips.

Do-it-yourself bicycle repair stands are should be considered, including tire gauges, air pumps, wrenches and other tools for minor repairs. At a minimum, a repair facility should be located within the underground parking garage for use by residents and a secondary facility be located adjacent the commercial block for use by employees/visitors.

8.4.5 End of Trip Facilities (Commercial)

End of trip facilities for employees is an important supportive measure to encourage bicycling as a commute mode, offering bicyclists a place to change and store their biking clothes.

As the commercial use proposed is small in scale and expected to have a limited number of employees, the provision of locker facilities for the storage of active wear and a private washroom in lieu of a change room are expected to be sufficient for the subject commercial building.

The applicant should determine the feasibility of this measure as part of the final design scheme.

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 the City's goals is critical, particularly, given that parking is an expensive resource.

The role of parking management is also a key element to helping Burlington meet its trip reduction goals. If free and unregulated parking is provided, there is little incentive for many employees and residents 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. Balancing these factors should help achieve trip reduction goals, reduce development costs, and support the success of a pedestrian friendly development.

8.5.1 Parking Supply

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 the Towns' goals is critical, particularly, given that parking is an expensive resource.

The role of parking management is also a key element to helping Milton meet its trip reduction goals. If free and unregulated parking is provided, there is little incentive for many residents and visitors to use alternative modes of transportation. Free and abundant parking encourages people to drive alone rather than car or van pool, be dropped off or picked up, walk, cycle or take transit. 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 however, the uses proposed on the site require a certain amount of base parking supply in order to be successful. Per the current development plan, 155 parking spaces are provided for the overall development program whereas the Zoning requirements suggest 188 parking spaces are required. Based on the imperial data collected as part of this study, it is evident that parking demand at typical apartments are significantly lower than the rates stipulated in the City's Zoning By-law and suggest a parking supply of 155 spaces is sufficient for the development.

8.3 Summary

The proposed development represents a compact, transit-supportive built form that maximizes the utility of the land and will create additional housing choices and new retail opportunities and employment uses in Downtown Burlington. Further realization of a complete community will be achieved by promoting transit use through its location in proximity to the John Street Transit Terminal. Facilities for active transportation will be provided creating a high quality and safe pedestrian environment to promote activity throughout the day.

To further promote sustainable modes of travel, a TDM plan is recommended for the development and should reference the above for inclusion. The existence of these options does not necessarily ensure they will be utilized. However, these alternatives are considered to provide significant encouragement to those residents willing to make the change to sustainable transportation.

9 Conclusions and Recommendations

9.1 Conclusions

Transportation

This study evaluated the impacts of background traffic growth and projected the impacts of the development within the construction of 150 condominium units and 6,451± sf of ground floor retail uses. Access to the site is proposed via two a one-way inbound driveway connection from Lakeshore Road and an all-directional driveway to Old Lakeshore Road. The Lakeshore Road connection will accommodate garbage collection, loading and service activities of the development whereas the Old Lakeshore Road connection will facilitate access to the underground parking garage area.

Full-build out of the development is projected to generate approximately 50 new vehicle trips during the weekday AM peak hour and 59 new vehicle trips during the weekday PM peak hour.

Of importance, the development is located within a designated Anchor Mobility Hub (Downtown Bus Terminal) which is planned to integrate rapid transit, regional transit and local transit. Within the development located in an Anchor Mobility Hub, the land use lends itself to being less reliant on auto use where residents and visitors can take advantage of additional transportation choices; walking, cycling and transit. As a result, it is expected that the land use will generate reduced vehicle trips and parking demand due to the locale.

The Halton Region Transportation Master Plan (2031) – The Road to Change defines a sustainable, integrated transportation system that considers all modes of travel (automobiles, transit, cycling, walking) and supports the policies and objectives arising out of the Halton Region Official Plan Review to the year 2031 (ROPA 38).

The Region has identified aggressive transit mode share targets to be reached over the next 12 years with transit mode share seeking a target of 20% of all trips. Since the immediate study area is currently achieving half of this target, the intensification of this site as a transit-oriented development will transform the resident mode share that is needed to meet the Region's target. The intensification of the downtown will be key to moving towards the Region's mode share targets by directing growth to encourage a pedestrian, cycling and transit-first community, where dependence on the private automobile is minimized.

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.

It is acknowledged that deficiencies at the Lakeshore Road and Martha Street intersection are projected to occur in the future with anticipated growth in traffic, independent of the development. To address these deficiencies the following mitigation measure is recommended to be implemented by the City:

- **Lakeshore Road and Martha Street** – The City consider restricting the southbound approach to right turns only during the weekday AM peak hour from Monday to Friday. This improvement is recommended to address projected capacity deficiencies and potential delay, independent of the proposed development.

A left turn lane warrant analysis was conducted along Old Lakeshore Road at Driveway A and found that a left-turn lane is not warranted to service development traffic.

Parking

Zoning By-law 2020 is the current in-force By-law for the City of Burlington and stipulates a parking rate of 1.25 spaces per unit is required for the development (i.e. 188 parking spaces). The proposed site provides for a total of 155 parking spaces; equating to a ratio of 1.03 spaces per unit.

The parking requirements outlined in Zoning By-Law 2020 is based on an approach the caters to auto oriented travel rather than transition to promote residential and visitor travel through sustainable modes. Parking ratios need to recognize empirical evidence that parking demand has many factors and varies according to household size, income, auto ownership, and locational factors such as proximity to other uses and availability of multiple transportation mobility options.

A review of actual parking demand that is likely to be generated by the proposed development has been considered to assess, independent and separate from a review of Zoning By-Law requirements. The actual demand established is based upon parking demand technical resources and information collected by Paradigm at comparable land uses. The actual parking demand for the proposed development based on this data is



projected to be 149 vehicles; equating to a ratio of 0.99 spaces per unit (resident and visitor).

Based on the imperial data collected as part of this study, it is evident that parking demand at High-Rise developments are significantly lower than the rates stipulated in the City's Zoning By-law. The data collected at a local level and through industry standard data is reflected of real-world conditions and supports a lower level of parking demand than what current and proposed Zoning By-law requires.

With the development located in a future Anchor Mobility Hub, the development has the potential to be transit supportive and promote active transportation. It will also introduce the residential population of the development to maximize the benefits of the site's location to a comprehensive and integrated transit system (Burlington Transit and GO Transit). As the development promotes the use of other modes of transportation through a limited number of on-site vehicle parking, the development has a significant role in setting an example for residents to consider non-automotive travel if they chose.

The projected demand provides a statistically valid justification that the proposed parking supply of 155 spaces (1.03 spaces per unit) is sufficient for the intended use.

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 City of Burlington recognize the conclusions drawn above;
- Site Driveway operate with a single inbound and outbound travel lane with stop control provided for the minor approach;
- Optimizing select signals, if necessary, after build-out to better support the future traffic volumes and travel patterns;
- The applicant develops and implement a TDM plan with the measures identified herein to support sustainable travel modes.

Through the combination of the mitigation measures proposed to address future deficiencies, the projected future traffic volumes can be accommodated within the study area.

Appendix A

Traffic 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

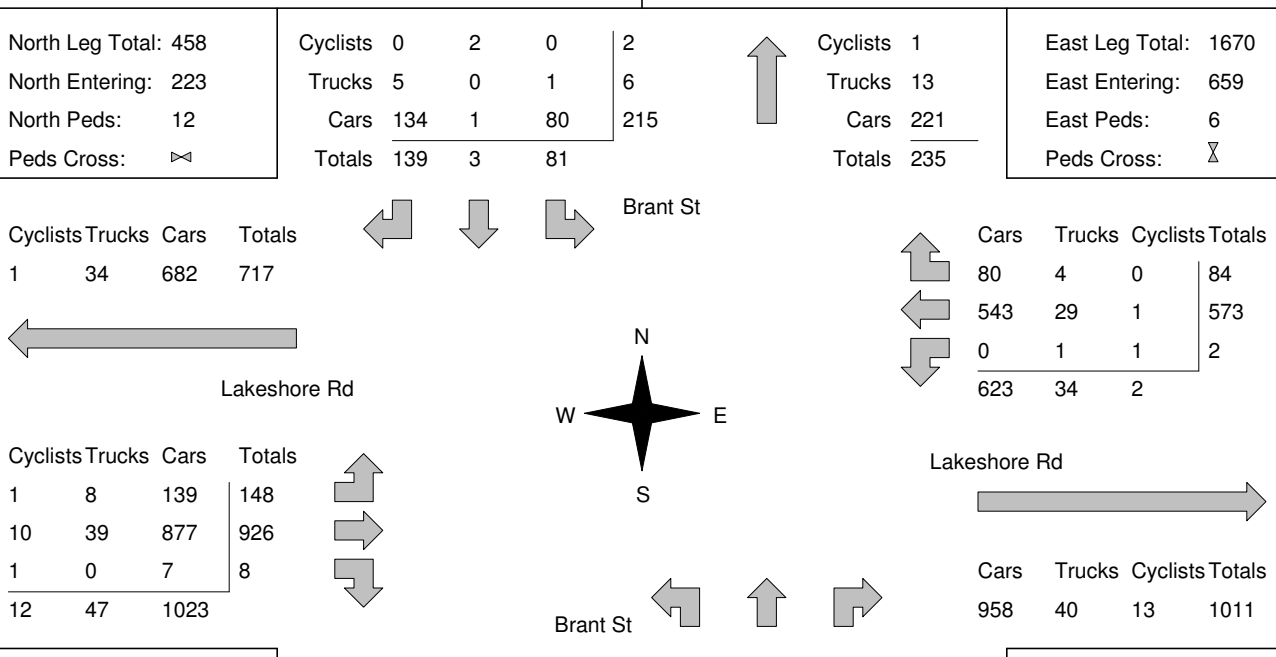
Municipality: Burlington
Site #: 0000200266
Intersection: Lakeshore Rd & Brant St
TFR File #: 1
Count date: 24-Apr-2018

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

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

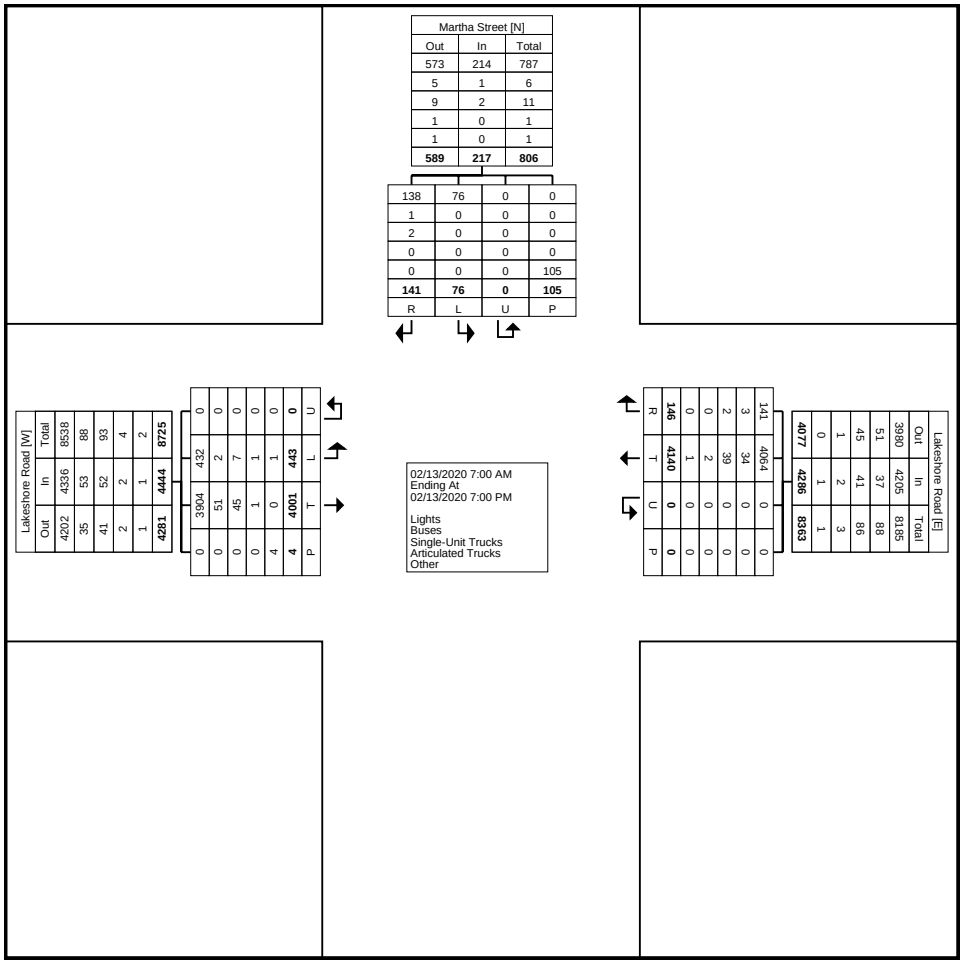
Start Time	Lakeshore Road Eastbound					Lakeshore Road Westbound					Martha Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	10	157	0	0	167	52	0	0	0	52	2	3	0	4	5	224
7:15 AM	12	165	0	0	177	75	1	0	0	76	2	3	0	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
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Count Name: Lakeshore Road & Martha Street
Site Code: 170176
Start Date: 02/13/2020



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
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Count Name: Lakeshore Road & Martha Street
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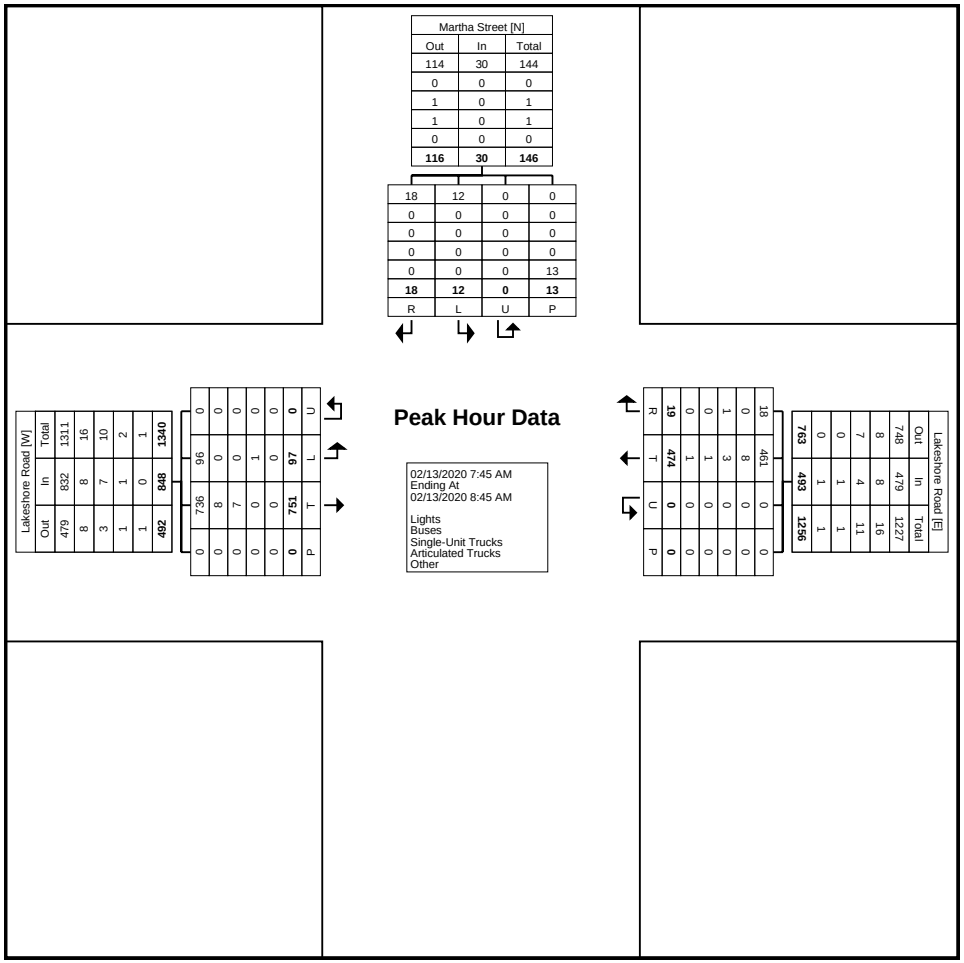
Turning Movement Peak Hour Data (7:45 AM)

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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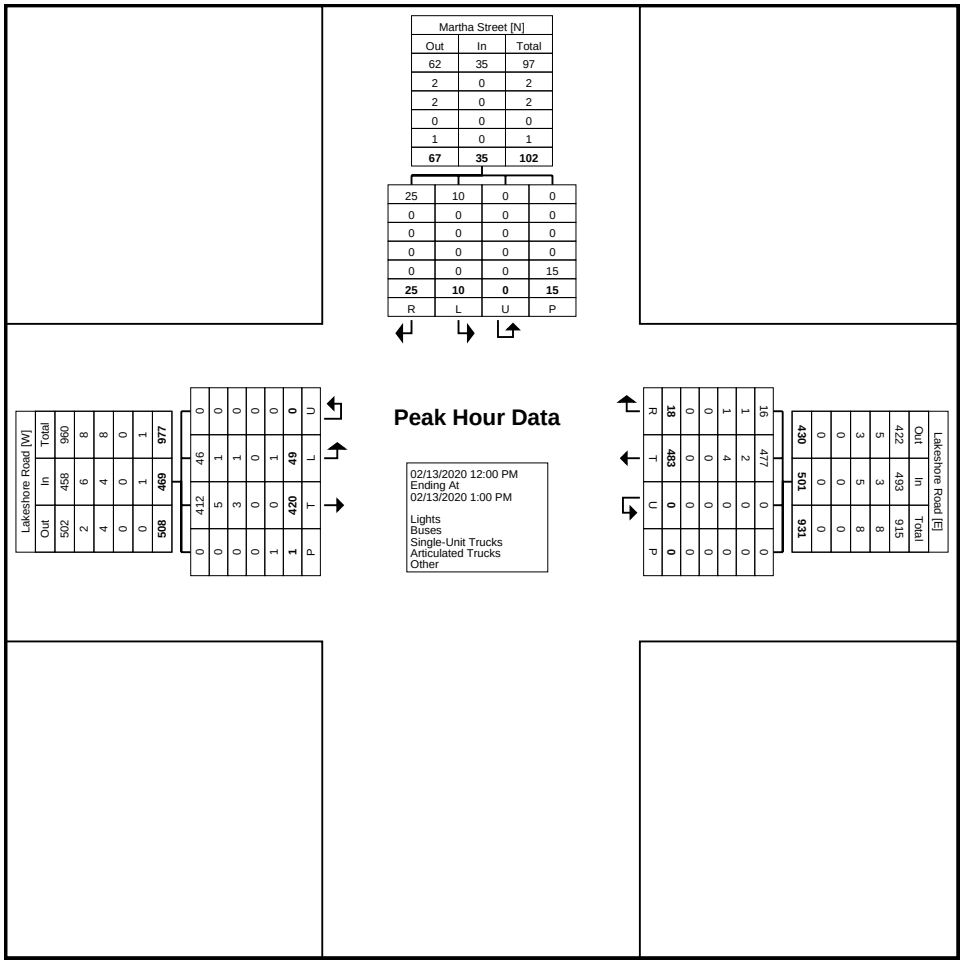
Turning Movement Peak Hour Data (12:00 PM)

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	-	-

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 (12:00 PM)

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5A-150 Pinebush Rd

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Count Name: Lakeshore Road & Martha Street
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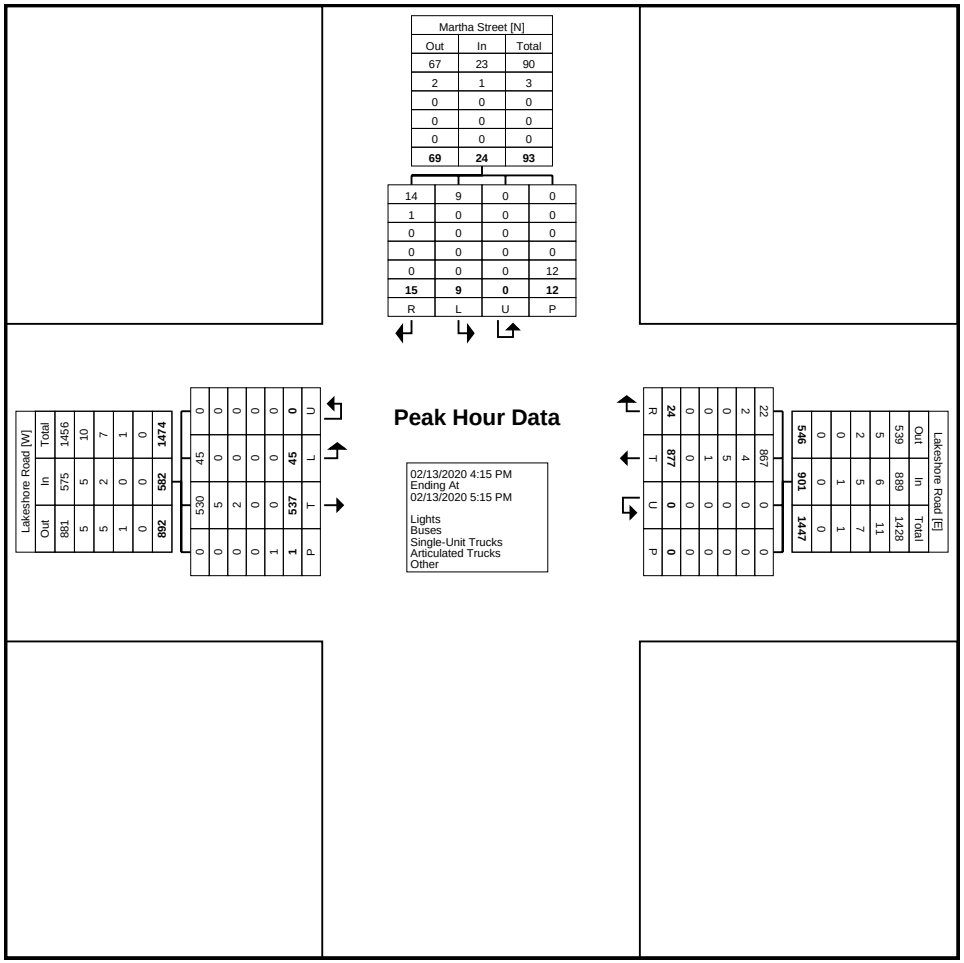
Turning Movement Peak Hour Data (4:15 PM)

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

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



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

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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

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519-896-3163 cbowness@ptsl.com

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

Turning Movement Data

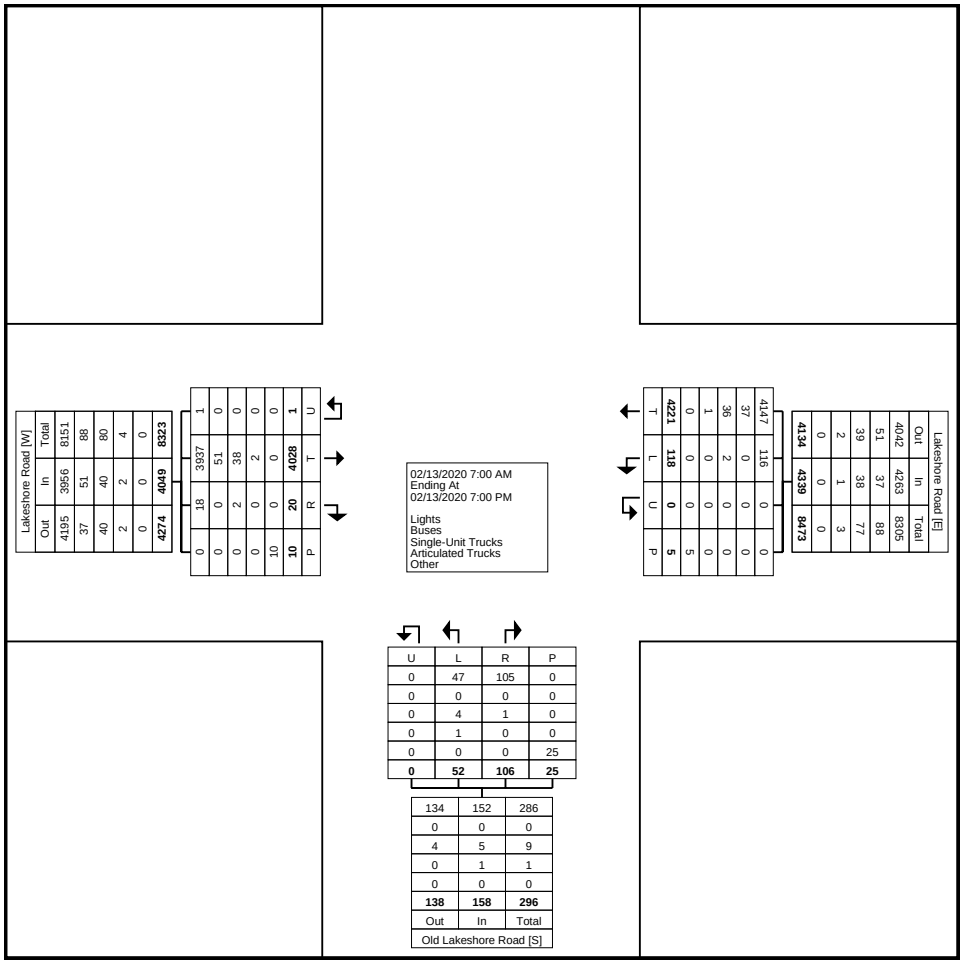
Start Time	Lakeshore Road Eastbound					Lakeshore Road Westbound					Old Lakeshore Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	160	0	0	1	160	0	52	0	0	52	0	1	0	1	1	213
7:15 AM	166	0	0	0	166	1	79	0	0	80	0	0	0	0	0	246
7:30 AM	198	0	0	0	198	4	98	0	0	102	2	1	0	2	3	303
7:45 AM	200	0	0	2	200	2	99	0	0	101	2	0	0	2	2	303
Hourly Total	724	0	0	3	724	7	328	0	0	335	4	2	0	5	6	1065
8:00 AM	199	1	0	0	200	3	131	0	0	134	1	4	0	0	5	339
8:15 AM	206	1	0	0	207	6	118	0	1	124	0	1	0	0	1	332
8:30 AM	165	0	0	0	165	1	135	0	0	136	0	0	0	0	0	301
8:45 AM	159	0	0	0	159	8	121	0	0	129	1	5	0	2	6	294
Hourly Total	729	2	0	0	731	18	505	0	1	523	2	10	0	2	12	1266
9:00 AM	145	0	0	0	145	2	113	0	0	115	3	0	0	0	3	263
9:15 AM	118	0	0	0	118	5	112	0	0	117	0	1	0	1	1	236
9:30 AM	107	1	0	0	108	3	126	0	0	129	1	1	0	1	2	239
9:45 AM	97	1	0	0	98	4	87	0	0	91	2	3	0	0	5	194
Hourly Total	467	2	0	0	469	14	438	0	0	452	6	5	0	2	11	932
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	73	2	0	0	75	4	101	0	1	105	3	4	0	2	7	187
11:45 AM	89	3	0	0	92	5	76	0	0	81	2	3	0	0	5	178
Hourly Total	162	5	0	0	167	9	177	0	1	186	5	7	0	2	12	365
12:00 PM	107	0	0	0	107	1	123	0	1	124	3	5	0	0	8	239
12:15 PM	102	1	0	0	103	6	110	0	0	116	3	4	0	0	7	226
12:30 PM	98	1	0	1	99	7	135	0	0	142	3	3	0	2	6	247
12:45 PM	112	0	0	1	112	6	119	0	1	125	5	4	0	1	9	246
Hourly Total	419	2	0	2	421	20	487	0	2	507	14	16	0	3	30	958
1:00 PM	84	1	0	1	85	2	104	0	0	106	2	9	0	2	11	202
1:15 PM	94	1	0	0	95	2	126	0	0	128	3	5	0	0	8	231
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	178	2	0	1	180	4	230	0	0	234	5	14	0	2	19	433
4:00 PM	116	3	0	0	119	3	182	0	0	185	1	4	0	0	5	309
4:15 PM	138	1	1	0	140	3	208	0	0	211	4	5	0	0	9	360
4:30 PM	105	0	0	0	105	2	247	0	1	249	0	1	0	0	1	355
4:45 PM	154	0	0	1	154	8	233	0	0	241	1	7	0	2	8	403
Hourly Total	513	4	1	1	518	16	870	0	1	886	6	17	0	2	23	1427
5:00 PM	144	0	0	0	144	2	210	0	0	212	3	4	0	0	7	363
5:15 PM	115	1	0	0	116	6	197	0	0	203	0	9	0	2	9	328
5:30 PM	132	0	0	2	132	3	179	0	0	182	1	3	0	2	4	318

5:45 PM	103	1	0	0	104	5	166	0	0	171	1	3	0	1	4	279
Hourly Total	494	2	0	2	496	16	752	0	0	768	5	19	0	5	24	1288
6:00 PM	105	0	0	0	105	3	116	0	0	119	1	3	0	1	4	228
6:15 PM	82	0	0	0	82	4	112	0	0	116	1	5	0	0	6	204
6:30 PM	79	1	0	0	80	4	106	0	0	110	0	4	0	1	4	194
6:45 PM	76	0	0	1	76	3	100	0	0	103	3	4	0	0	7	186
Hourly Total	342	1	0	1	343	14	434	0	0	448	5	16	0	2	21	812
Grand Total	4028	20	1	10	4049	118	4221	0	5	4339	52	106	0	25	158	8546
Approach %	99.5	0.5	0.0	-	-	2.7	97.3	0.0	-	-	32.9	67.1	0.0	-	-	-
Total %	47.1	0.2	0.0	-	47.4	1.4	49.4	0.0	-	50.8	0.6	1.2	0.0	-	1.8	-
Lights	3937	18	1	-	3956	116	4147	0	-	4263	47	105	0	-	152	8371
% Lights	97.7	90.0	100.0	-	97.7	98.3	98.2	-	-	98.2	90.4	99.1	-	-	96.2	98.0
Buses	51	0	0	-	51	0	37	0	-	37	0	0	0	-	0	88
% Buses	1.3	0.0	0.0	-	1.3	0.0	0.9	-	-	0.9	0.0	0.0	-	-	0.0	1.0
Single-Unit Trucks	38	2	0	-	40	2	36	0	-	38	4	1	0	-	5	83
% Single-Unit Trucks	0.9	10.0	0.0	-	1.0	1.7	0.9	-	-	0.9	7.7	0.9	-	-	3.2	1.0
Articulated Trucks	2	0	0	-	2	0	1	0	-	1	1	0	0	-	1	4
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	1.9	0.0	-	-	0.6	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	-	-	-	10	-	-	-	-	5	-	-	-	-	25	-	-
% 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 & Old Lakeshore Road
Site Code: 170176
Start Date: 02/13/2020



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 & Old Lakeshore Road
Site Code: 170176
Start Date: 02/13/2020

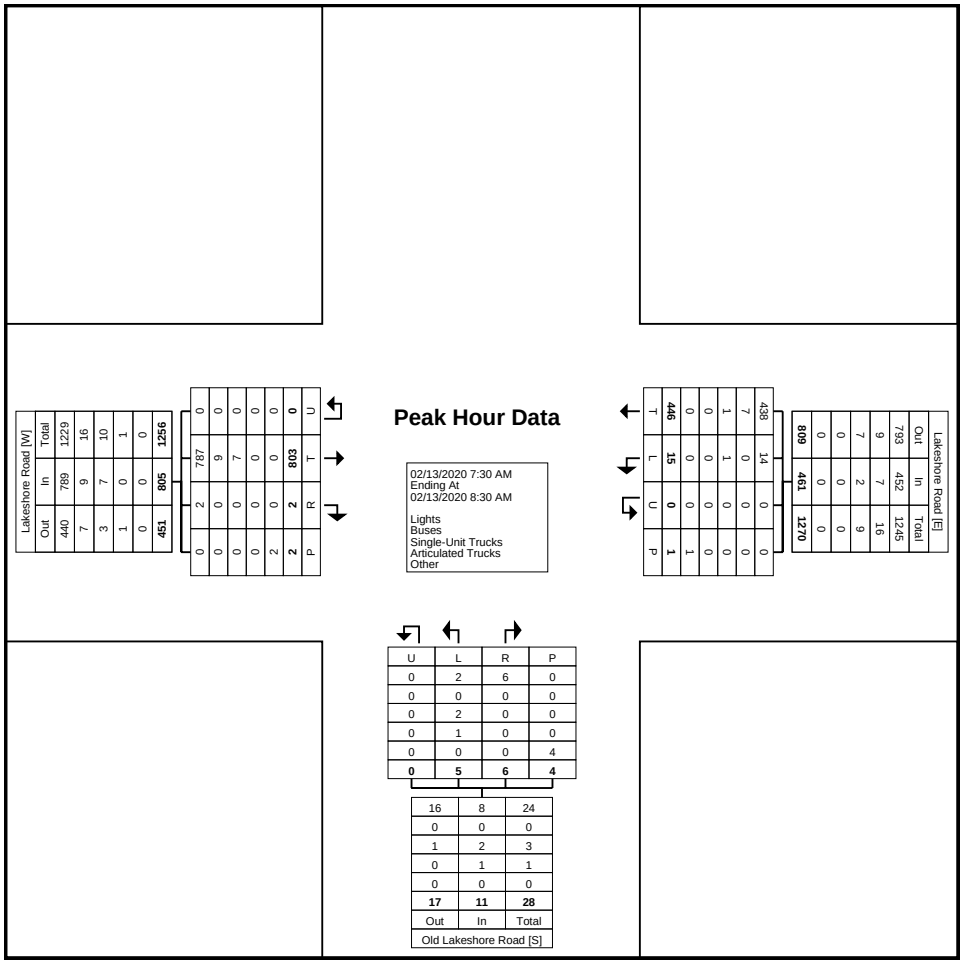
Turning Movement Peak Hour Data (7:30 AM)

Start Time	Lakeshore Road Eastbound					Lakeshore Road Westbound					Old Lakeshore Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:30 AM	198	0	0	0	198	4	98	0	0	102	2	1	0	2	3	303
7:45 AM	200	0	0	2	200	2	99	0	0	101	2	0	0	2	2	303
8:00 AM	199	1	0	0	200	3	131	0	0	134	1	4	0	0	5	339
8:15 AM	206	1	0	0	207	6	118	0	1	124	0	1	0	0	1	332
Total	803	2	0	2	805	15	446	0	1	461	5	6	0	4	11	1277
Approach %	99.8	0.2	0.0	-	-	3.3	96.7	0.0	-	-	45.5	54.5	0.0	-	-	-
Total %	62.9	0.2	0.0	-	63.0	1.2	34.9	0.0	-	36.1	0.4	0.5	0.0	-	0.9	-
PHF	0.975	0.500	0.000	-	0.972	0.625	0.851	0.000	-	0.860	0.625	0.375	0.000	-	0.550	0.942
Lights	787	2	0	-	789	14	438	0	-	452	2	6	0	-	8	1249
% Lights	98.0	100.0	-	-	98.0	93.3	98.2	-	-	98.0	40.0	100.0	-	-	72.7	97.8
Buses	9	0	0	-	9	0	7	0	-	7	0	0	0	-	0	16
% Buses	1.1	0.0	-	-	1.1	0.0	1.6	-	-	1.5	0.0	0.0	-	-	0.0	1.3
Single-Unit Trucks	7	0	0	-	7	1	1	0	-	2	2	0	0	-	2	11
% Single-Unit Trucks	0.9	0.0	-	-	0.9	6.7	0.2	-	-	0.4	40.0	0.0	-	-	18.2	0.9
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	20.0	0.0	-	-	9.1	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	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	1	-	-	-	-	4	-	-
% 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 & Old Lakeshore Road
Site Code: 170176
Start Date: 02/13/2020



Lakeshore Road [W]								
Out	440	7	3	1	0	**451**	2	0
In	789	9	7	0	0	**805**	0	0
Total	1229	16	10	1	0	**1256**	2	0

U	T	R	P
0	787	2	0
0	9	0	0
0	7	0	0
0	0	0	0
0	0	0	2
0	**803**	**2**	**2**

T	L	U	P	
438	14	0	0	
7	0	0	0	
1	1	0	0	
0	1	0	1	
0	0	0	1	
446	**15**	**0**	**1**	
0	0	0	0	

Lakeshore Road [E]								
Total	1245	16	9	2	7	**1270**	0	0
In	452	7	9	2	7	**461**	0	0
Out	793	9	7	0	0	**809**	0	0

U	L	R	P
0	2	6	0
0	0	0	0
0	2	0	0
0	1	0	0
0	0	0	4
0	**5**	**6**	**4**

16	8	24
0	0	0
1	2	3
0	1	1
0	0	0
17	**11**	**28**
Out	In	Total
Old Lakeshore Road [S]		

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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

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

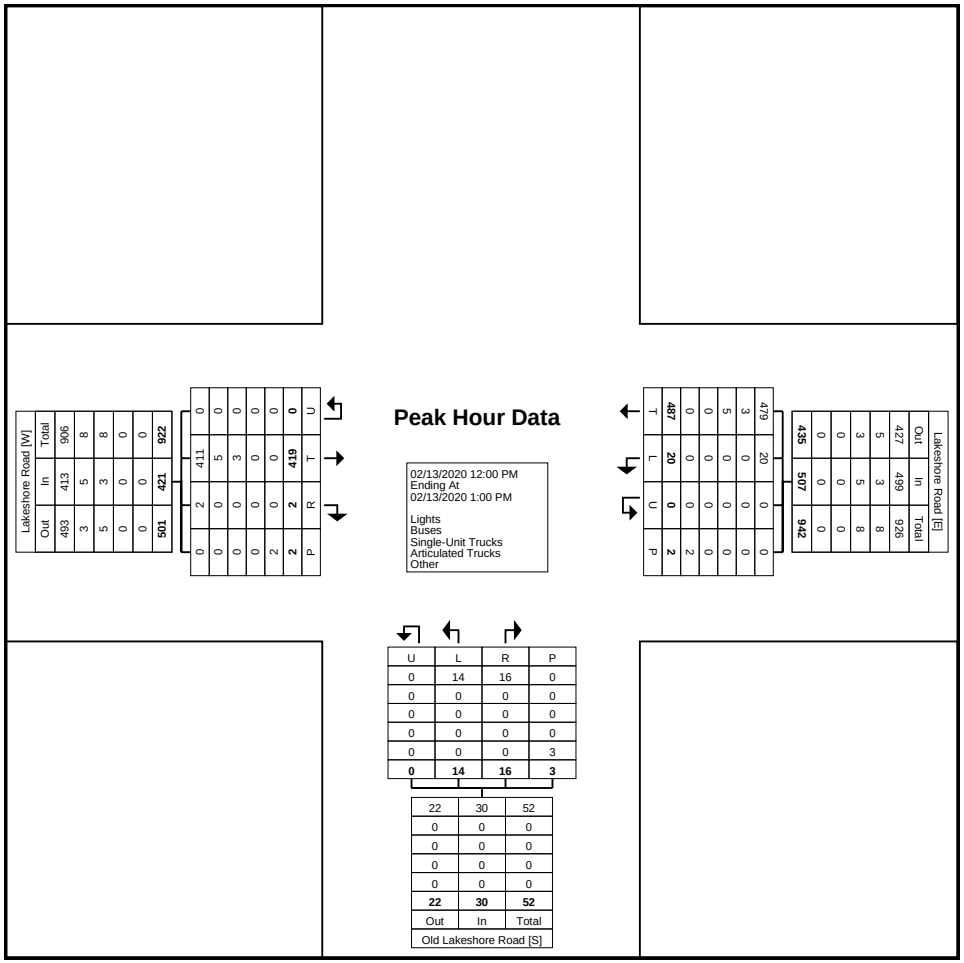
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Lakeshore Road Eastbound					Lakeshore Road Westbound					Old Lakeshore Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	107	0	0	0	107	1	123	0	1	124	3	5	0	0	8	239
12:15 PM	102	1	0	0	103	6	110	0	0	116	3	4	0	0	7	226
12:30 PM	98	1	0	1	99	7	135	0	0	142	3	3	0	2	6	247
12:45 PM	112	0	0	1	112	6	119	0	1	125	5	4	0	1	9	246
Total	419	2	0	2	421	20	487	0	2	507	14	16	0	3	30	958
Approach %	99.5	0.5	0.0	-	-	3.9	96.1	0.0	-	-	46.7	53.3	0.0	-	-	-
Total %	43.7	0.2	0.0	-	43.9	2.1	50.8	0.0	-	52.9	1.5	1.7	0.0	-	3.1	-
PHF	0.935	0.500	0.000	-	0.940	0.714	0.902	0.000	-	0.893	0.700	0.800	0.000	-	0.833	0.970
Lights	411	2	0	-	413	20	479	0	-	499	14	16	0	-	30	942
% Lights	98.1	100.0	-	-	98.1	100.0	98.4	-	-	98.4	100.0	100.0	-	-	100.0	98.3
Buses	5	0	0	-	5	0	3	0	-	3	0	0	0	-	0	8
% Buses	1.2	0.0	-	-	1.2	0.0	0.6	-	-	0.6	0.0	0.0	-	-	0.0	0.8
Single-Unit Trucks	3	0	0	-	3	0	5	0	-	5	0	0	0	-	0	8
% Single-Unit Trucks	0.7	0.0	-	-	0.7	0.0	1.0	-	-	1.0	0.0	0.0	-	-	0.0	0.8
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	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	2	-	-	-	-	3	-	-
% 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 & Old Lakeshore Road
Site Code: 170176
Start Date: 02/13/2020



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

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

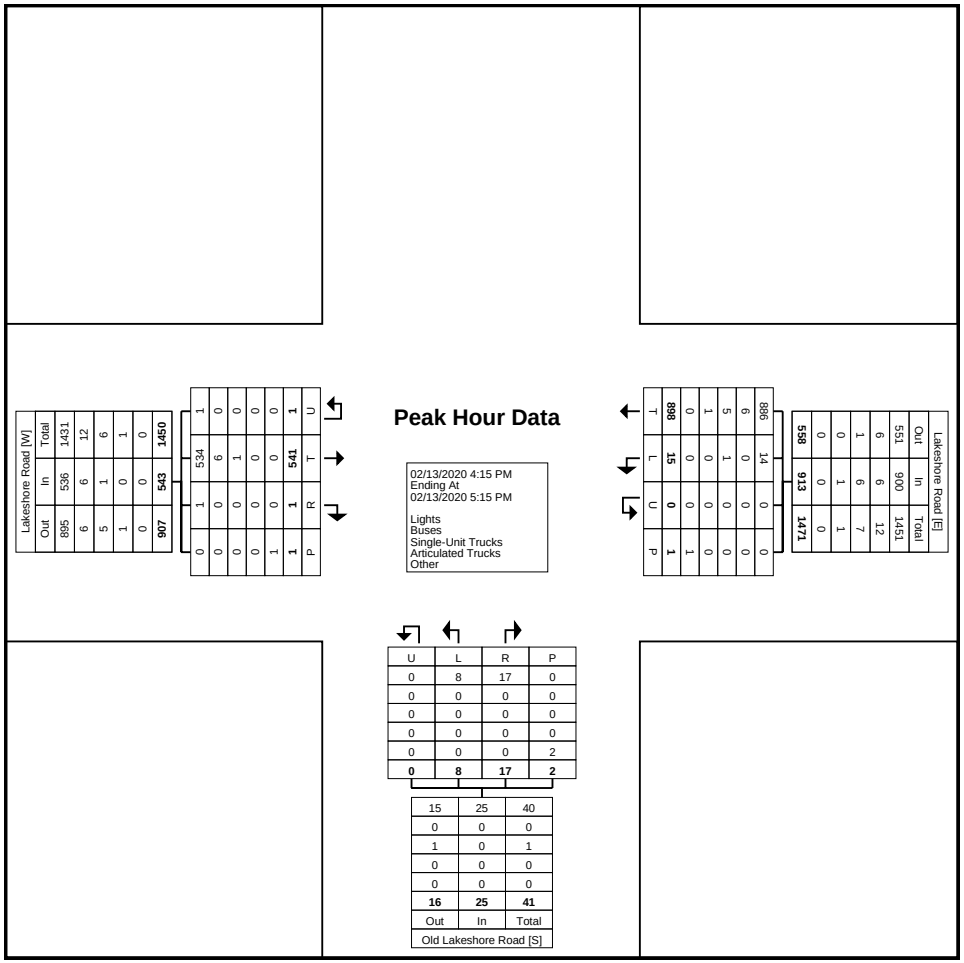
Turning Movement Peak Hour Data (4:15 PM)

Start Time	Lakeshore Road Eastbound					Lakeshore Road Westbound					Old Lakeshore Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	138	1	1	0	140	3	208	0	0	211	4	5	0	0	9	360
4:30 PM	105	0	0	0	105	2	247	0	1	249	0	1	0	0	1	355
4:45 PM	154	0	0	1	154	8	233	0	0	241	1	7	0	2	8	403
5:00 PM	144	0	0	0	144	2	210	0	0	212	3	4	0	0	7	363
Total	541	1	1	1	543	15	898	0	1	913	8	17	0	2	25	1481
Approach %	99.6	0.2	0.2	-	-	1.6	98.4	0.0	-	-	32.0	68.0	0.0	-	-	-
Total %	36.5	0.1	0.1	-	36.7	1.0	60.6	0.0	-	61.6	0.5	1.1	0.0	-	1.7	-
PHF	0.878	0.250	0.250	-	0.881	0.469	0.909	0.000	-	0.917	0.500	0.607	0.000	-	0.694	0.919
Lights	534	1	1	-	536	14	886	0	-	900	8	17	0	-	25	1461
% Lights	98.7	100.0	100.0	-	98.7	93.3	98.7	-	-	98.6	100.0	100.0	-	-	100.0	98.6
Buses	6	0	0	-	6	0	6	0	-	6	0	0	0	-	0	12
% Buses	1.1	0.0	0.0	-	1.1	0.0	0.7	-	-	0.7	0.0	0.0	-	-	0.0	0.8
Single-Unit Trucks	1	0	0	-	1	1	5	0	-	6	0	0	0	-	0	7
% Single-Unit Trucks	0.2	0.0	0.0	-	0.2	6.7	0.6	-	-	0.7	0.0	0.0	-	-	0.0	0.5
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	0.1	-	-	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	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	1	-	-	-	-	1	-	-	-	-	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: Lakeshore Road & Old Lakeshore Road
Site Code: 170176
Start Date: 02/13/2020



Lakeshore Road [W]	U	T	R	P
Out	1	534	1	0
In	0	6	0	0
Total	0	1	0	0
	0	0	0	0
	0	0	0	1
	1	541	1	1
	1	6	0	0
	0	0	0	0
	1450	**543**	**907**	

	T	L	U	P
	886	14	0	0
	6	0	0	0
	5	1	0	0
	1	0	0	0
	0	0	0	0
	888	**15**	**0**	**1**
	0	0	0	1
	1	0	0	0
	1901	**30**	**0**	**2**

Lakeshore Road [E]	Out	In	Total
	551	900	1451
	6	6	12
	6	6	12
	1	6	7
	0	1	1
	0	1	1
	558	**913**	**1471**

U	L	R	P
0	8	17	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	2
0	**8**	**17**	**2**

15	25	40
0	0	0
1	0	1
0	0	0
0	0	0
16	**25**	**41**
Out	In	Total
Old Lakeshore Road [S]		

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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

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

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

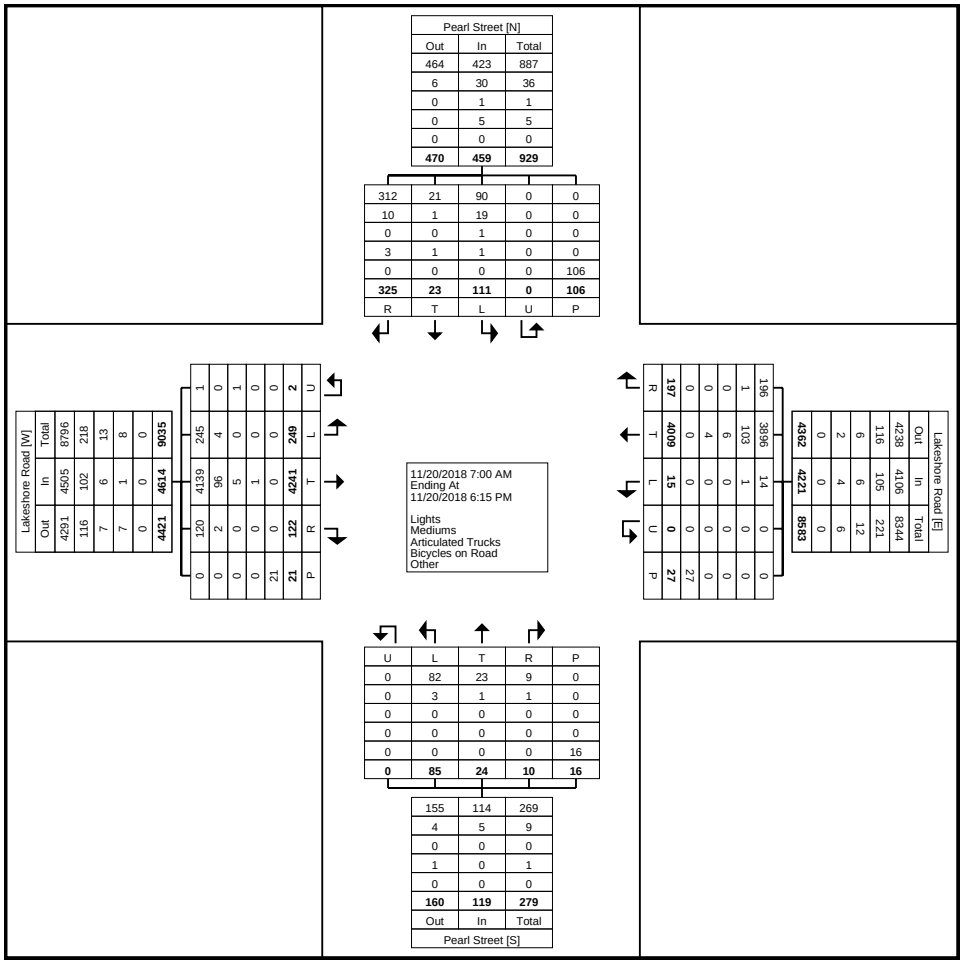
Start Time	Lakeshore Road Eastbound						Lakeshore Road Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 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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Turning Movement Data Plot

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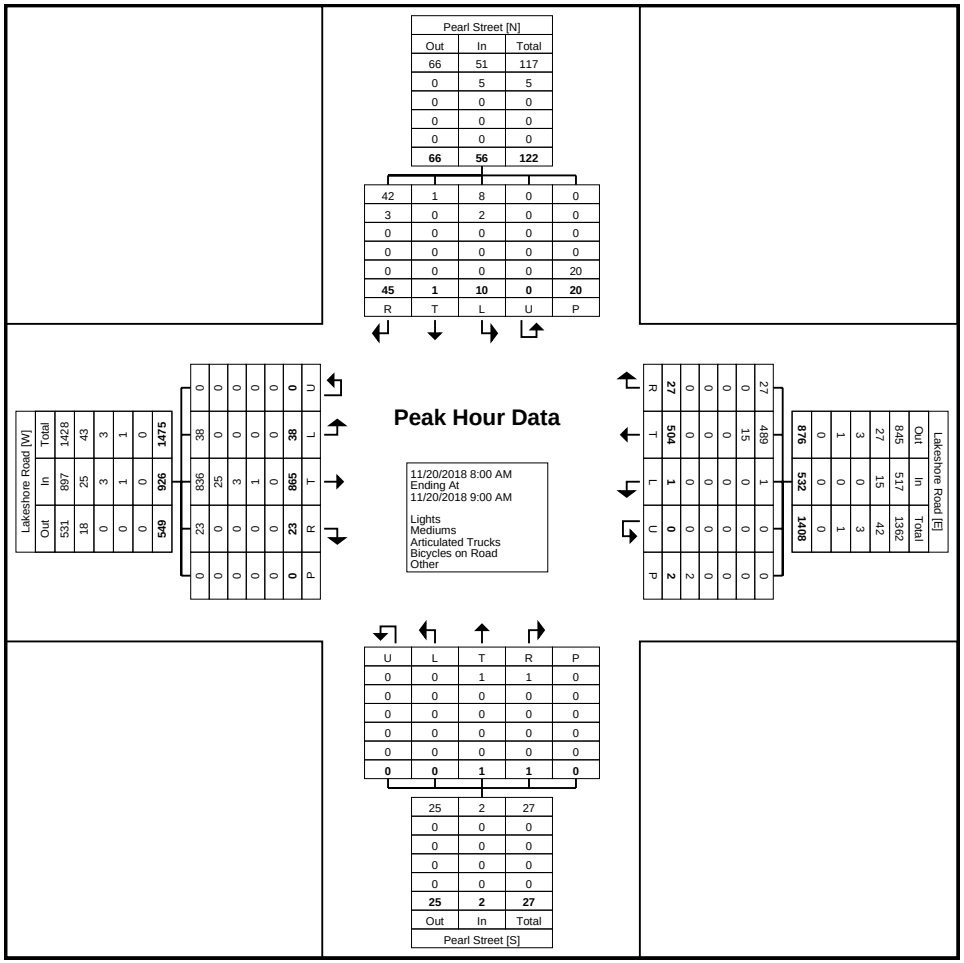
Turning Movement Peak Hour Data (8:00 AM)

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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Start Date: 11/20/2018



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

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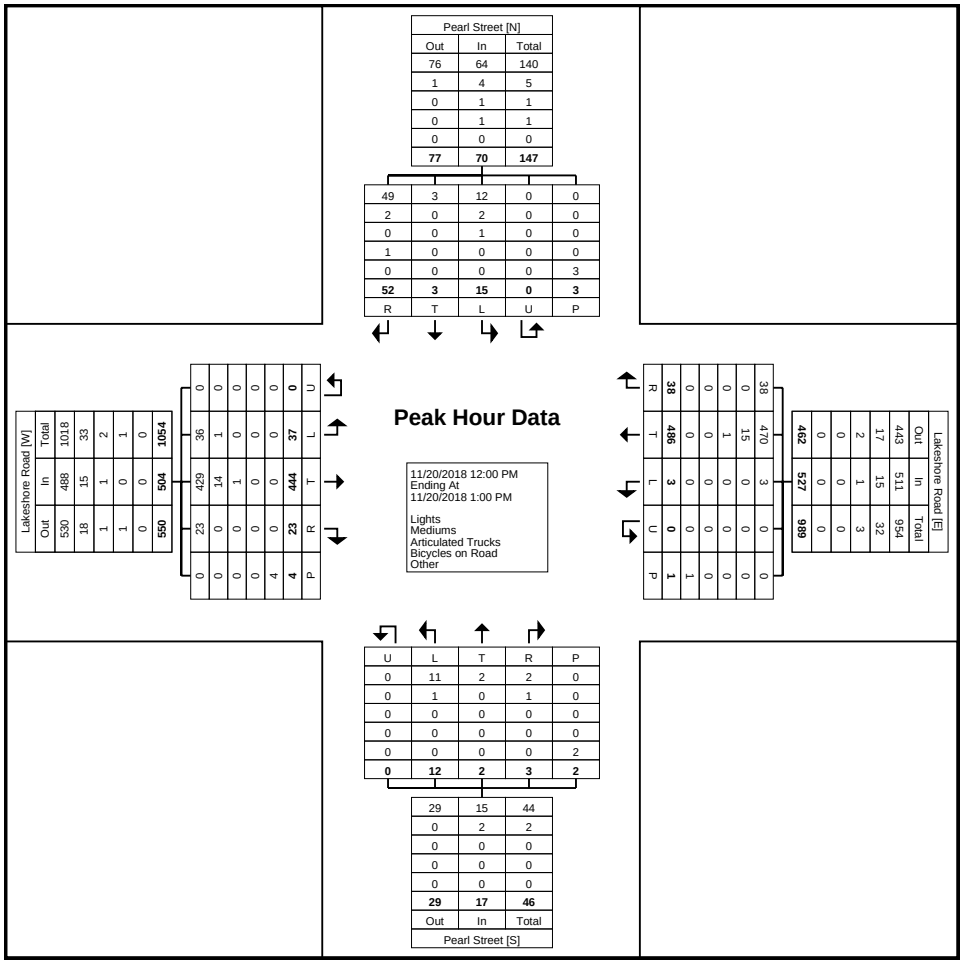
Turning Movement Peak Hour Data (12:00 PM)

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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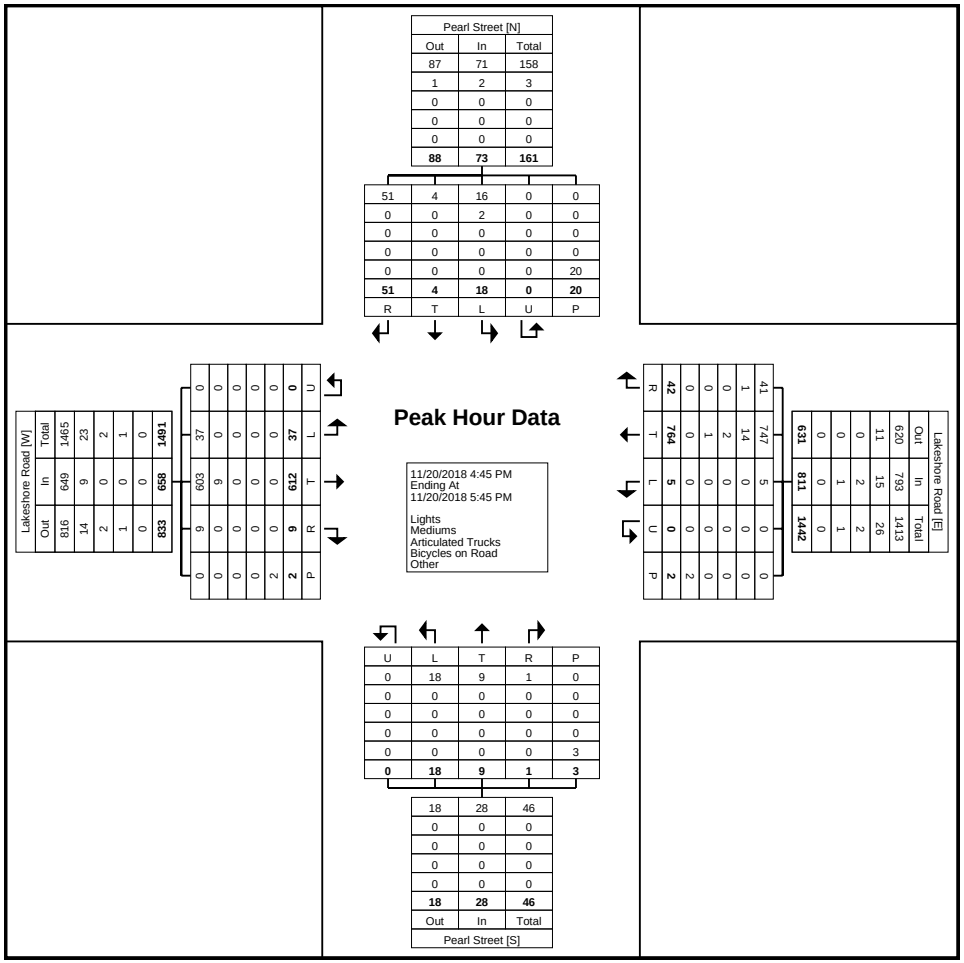
Turning Movement Peak Hour Data (4:45 PM)

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

Appendix B

ITE Trip Reduction Worksheet

Name of Development

Old Lakeshore Road

Time Period

AM Peak Hour

LAND USE A

ITE LU Code	222
Size	150 units

	Total	Internal	External
Enter	13	0	13
Exit	42	0	42
Total	55	0	55
%	100%	0%	100%

13 Enter from External

Exit to External 42

22 **53%** Demand

4 **31%** Demand

0 **0%** Demand

0 **0%** Demand

0 Balanced

0 Balanced

0 Balanced

0 Balanced

0 **9%** Demand

0 **12%** Demand

0 **0%** Demand

0 **0%** Demand

LAND USE B

ITE LU Code	Shopping Center 820
Size	6,451 ft^2

LAND USE C

ITE LU Code	
Size	

2 Exit to External

Enter from External 4

	Total	Internal	External
Enter	4	0	4
Exit	2	0	2
Total	6	0	6
%	100%	0%	100%

0 **0%** Demand

0 Balanced

0 **0%** Demand

0 **0%** Demand

0 Balanced

0 **0%** Demand

	Total	Internal	External
Enter	0	0	0
Exit	0	0	0
Total	0	0	0
%	100%	#DIV/0!	#DIV/0!

0 Enter from External

Exit to External 0

Net External Trips for Multi-Use Development				
	Land Use A	Land Use B	Land Use C	TOTAL
Enter	13	4	0	17
Exit	42	2	0	44
Total	55	6	0	61
Single Use Trip Gen	55	6	0	61

Internal Capture: 0%

Unconstrained Internal Capture Rates for Trip Origins within a Multi-Use Development

Daily

From OFFICE	to Office	2%
	to Retail	22%
	to Residential	2%
From RETAIL	to Office	3%
	to Retail	30%
	to Residential	11%
From RESIDENTIAL	to Office	N/A
	to Retail	38%
	to Residential	N/A

Unconstrained Internal Capture Rates for Trip Destinations within a Multi-Use Development

Daily

To OFFICE	from Office	2%
	from Retail	15%
	from Residential	0%
to RETAIL	from Office	4%
	from Retail	28%
	from Residential	9%
to RESIDENTIAL	from Office	3%
	from Retail	33%
	from Residential	N/A

Name of Development

Old Lakeshore Road

Time Period

AM Peak Hour

LAND USE A

ITE LU Code	222
Size	150 units

	Total	Internal	External
Enter	36	4	32
Exit	24	1	23
Total	60	5	55
%	100%	8%	92%

32 Enter from External

Exit to External 23

13 **53%** Demand

11 **31%** Demand

0 **0%** Demand

0 **0%** Demand

1 Balanced

4 Balanced

0 Balanced

0 Balanced

1 **9%** Demand

2 **12%** Demand

0 **0%** Demand

0 **0%** Demand

LAND USE B

ITE LU Code	Shopping Center
	820
Size	6,451 ft^2

LAND USE C

ITE LU Code	
Size	

9 Exit to External

Enter from External 11

	Total	Internal	External
Enter	12	1	11
Exit	13	4	9
Total	25	5	20
%	100%	20%	80%

Demand: 0 **0%** — Balanced: 0 — Demand: 0 **0%**

Demand: 0 **0%** — Balanced: 0 — Demand: 0 **0%**

	Total	Internal	External
Enter	0	0	0
Exit	0	0	0
Total	0	0	0
%	100%	#DIV/0!	#DIV/0!

0 Enter from External

Exit to External 0

Net External Trips for Multi-Use Development

	Land Use A	Land Use B	Land Use C	TOTAL
Enter	32	11	0	43
Exit	23	9	0	32
Total	55	20	0	75
Single Use Trip Gen	60	25	0	85

Internal Capture: 12%

Unconstrained Internal Capture Rates for Trip Origins within a Multi-Use Development

Daily

From OFFICE	to Office	2%
	to Retail	22%
	to Residential	2%
From RETAIL	to Office	3%
	to Retail	30%
	to Residential	11%
From RESIDENTIAL	to Office	N/A
	to Retail	38%
	to Residential	N/A

Unconstrained Internal Capture Rates for Trip Destinations within a Multi-Use Development

Daily

To OFFICE	from Office	2%
	from Retail	15%
	from Residential	0%
to RETAIL	from Office	4%
	from Retail	28%
	from Residential	9%
to RESIDENTIAL	from Office	3%
	from Retail	33%
	from Residential	N/A

Appendix C

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

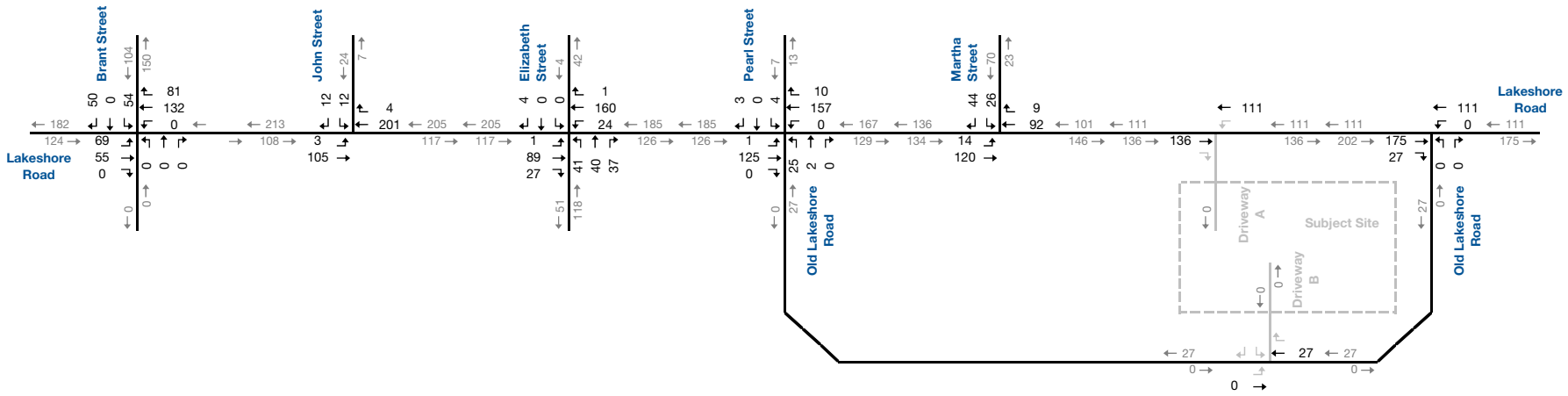
Trip 2016
Table: 166

	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		

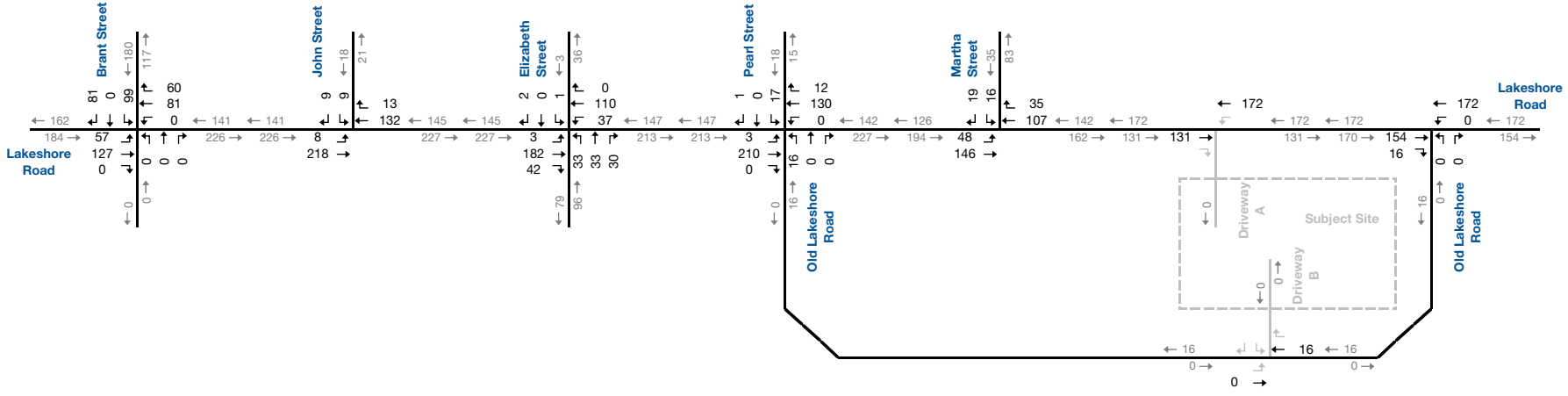
Appendix D

Background Development Projections

AM Peak



PM Peak



Appendix E

Synchro Operations Reports



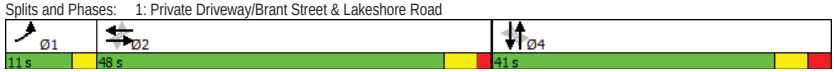
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	926	8	2	573	84	5	3	4	81	3	139
Future Volume (vph)	148	926	8	2	573	84	5	3	4	81	3	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		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	1643	0	1083	3019	0	0	1464	0	1608	1386	0
Flt Permitted	0.339			0.091				0.867		0.750		
Satd. Flow (perm)	548	1643	0	104	3019	0	0	1295	0	1258	1386	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			21			4			151	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			261.3			72.5			121.7	
Travel Time (s)		11.4			18.8			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%	50%	5%	5%	0%	33%	0%	1%	0%	4%
Adj. Flow (vph)	161	1007	9	2	623	91	5	3	4	88	3	151
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	1016	0	2	714	0	0	12	0	88	154	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	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%	
Maximum Green (s)	8.0	42.0		42.0	42.0		34.0	34.0		34.0	34.0	
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							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		None	None		None	None	
Walk Time (s)		11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		16.0		16.0	16.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	52.5	44.1		44.1	44.1			14.0		14.0	14.0	
Actuated g/C Ratio	0.69	0.58		0.58	0.58			0.18		0.18	0.18	
v/c Ratio	0.34	1.07		0.03	0.41			0.05		0.38	0.41	
Control Delay	5.8	70.6		10.0	10.0			21.8		32.7	8.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	5.8	70.6		10.0	10.0			21.8		32.7	8.8	
LOS	A	E		A	B			C		C	A	
Approach Delay		61.8			10.0			21.8			17.5	
Approach LOS		E			B			C			B	
Queue Length 50th (m)	5.8	~175.3		0.1	27.8			1.0		12.0	0.4	
Queue Length 95th (m)	14.1	#273.0		1.2	46.2			5.4		25.3	15.2	
Internal Link Dist (m)		134.0			237.3			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	484	947		60	1749			629		609	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	0.33	1.07		0.03	0.41			0.02		0.14	0.21	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 76.5			
Natural Cycle: 120			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 39.3		Intersection LOS: D	
Intersection Capacity Utilization 82.2%		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)	148	926	8	2	573	84	5	3	4	81	3	139
Future Volume (vph)	148	926	8	2	573	84	5	3	4	81	3	139
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		0.99	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)	1544	1642		1083	3021			1464		1597	1386	
Flt Permitted	0.34	1.00		0.09	1.00			0.87		0.75	1.00	
Satd. Flow (perm)	551	1642		103	3021			1296		1260	1386	
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)	161	1007	9	2	623	91	5	3	4	88	3	151
RTOR Reduction (vph)	0	0	0	0	9	0	0	3	0	0	123	0
Lane Group Flow (vph)	161	1016	0	2	705	0	0	9	0	88	31	0
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
Heavy Vehicles (%)	5%	4%	0%	50%	5%	5%	0%	33%	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			11.0		11.0	11.0	
Effective Green, g (s)	49.5	44.1		44.1	44.1			14.0		14.0	14.0	
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)	452	946		59	1741			237		230	253	
v/s Ratio Prot	c0.03	c0.62			0.23						0.02	
v/s Ratio Perm	0.20			0.02				0.01		c0.07		
v/c Ratio	0.36	1.07		0.03	0.41			0.04		0.38	0.12	
Uniform Delay, d1	5.5	16.2		7.0	9.0			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	51.1		1.1	0.7			0.1		1.1	0.2	
Delay (s)	6.0	67.3		8.1	9.7			25.8		28.5	26.3	
Level of Service	A	E		A	A			C		C	C	
Approach Delay (s)		58.9			9.6			25.8			27.1	
Approach LOS		E			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	82.2%	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)	38	874	23	1	509	27	0	1	1	10	1	45
Future Volume (vph)	38	874	23	1	509	27	0	1	1	10	1	45
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	0.98				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	1655	0	1624	3128	0	0	1574	0	1354	1365	0
Flt Permitted	0.433			0.251						0.757		
Satd. Flow (perm)	729	1655	0	429	3128	0	0	1574	0	1073	1365	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			11			1			49	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		261.3			120.7			256.8			57.7	
Travel Time (s)		18.8			8.7			18.5			4.2	
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)	41	950	25	1	553	29	0	1	1	11	1	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	975	0	1	582	0	0	2	0	11	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA			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%	
Maximum Green (s)	73.0	73.0		73.0	73.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		Max	Max		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	84.5	84.5		84.5	84.5			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	0.69		0.00	0.22			0.01		0.10	0.27	
Control Delay	2.2	7.0		2.0	2.0			34.0		40.6	15.7	
Queue Delay	0.0	0.4		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.2	7.5		2.0	2.0			34.0		40.6	15.7	
LOS	A	A		A	A			C		D	B	
Approach Delay		7.3			2.0			34.0			20.2	
Approach LOS		A			A			C			C	
Queue Length 50th (m)	1.2	63.3		0.0	9.8			0.2		2.2	0.2	
Queue Length 95th (m)	3.2	114.3		0.3	14.6			m1.9		7.3	10.9	
Internal Link Dist (m)		237.3			96.7			232.8			33.7	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	622	1412		366	2670			431		293	409	
Starvation Cap Reductn	0	123		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	0.76		0.00	0.22			0.00		0.04	0.12	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 99			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 5.9		Intersection LOS: A	
Intersection Capacity Utilization 66.7%		ICU Level of Service C	

Analysis Period (min) 15

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

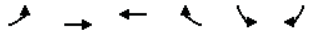
Splits and Phases: 2: Pearl Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	874	23	1	509	27	0	1	1	10	1	45
Future Volume (vph)	38	874	23	1	509	27	0	1	1	10	1	45
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)	1601	1655		1624	3127			1575		1348	1365	
Flt Permitted	0.43	1.00		0.25	1.00			1.00		0.76	1.00	
Satd. Flow (perm)	729	1655		429	3127			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)	41	950	25	1	553	29	0	1	1	11	1	49
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	45	0
Lane Group Flow (vph)	41	975	0	1	580	0	0	1	0	11	5	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			NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	81.6	81.6		81.6	81.6			6.6		6.6	6.6	
Effective Green, g (s)	83.6	83.6		83.6	83.6			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)	608	1380		357	2608			135		92	117	
v/s Ratio Prot		c0.59			0.19			0.00			0.00	
v/s Ratio Perm	0.06			0.00						c0.01		
v/c Ratio	0.07	0.71		0.00	0.22			0.01		0.12	0.04	
Uniform Delay, d1	1.5	3.3		1.4	1.7			41.9		42.3	42.0	
Progression Factor	1.00	1.00		1.00	1.00			1.05		1.00	1.00	
Incremental Delay, d2	0.0	1.7		0.0	0.2			0.0		0.6	0.2	
Delay (s)	1.5	5.0		1.4	1.9			43.9		42.9	42.2	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		4.9			1.9			43.9			42.3	
Approach LOS		A			A			D			D	

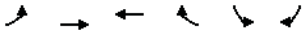
Intersection Summary					
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.65				
Actuated Cycle Length (s)	100.2	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	66.7%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	97	788	519	19	12	18
Future Volume (vph)	97	788	519	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)	1624	1644	1605	0	1504	0
Flt Permitted	0.950				0.981	
Satd. Flow (perm)	1624	1644	1605	0	1504	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	157.7		57.9	
Travel Time (s)		8.7	11.4		4.2	
Confl. Peds. (#/hr)	22			22		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	6%	7%	0%	4%
Adj. Flow (vph)	105	857	564	21	13	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	105	857	585	0	33	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	97	788	519	19	12	18
Future Volume (Veh/h)	97	788	519	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	857	564	21	13	20
Pedestrians					22	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					2	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		121				
pX, platoon unblocked					0.76	
vC, conflicting volume	607				1664	596
vC1, stage 1 conf vol					596	
vC2, stage 2 conf vol					1067	
vCu, unblocked vol	607				1716	596
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)	963				235	490

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	105	857	585	33
Volume Left	105	0	0	13
Volume Right	0	0	21	20
cSH	963	1700	1700	344
Volume to Capacity	0.11	0.50	0.34	0.10
Queue Length 95th (m)	2.9	0.0	0.0	2.5
Control Delay (s)	9.2	0.0	0.0	16.6
Lane LOS	A			C
Approach Delay (s)	1.0		0.0	16.6
Approach LOS				C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	798	2	15	533	5	6
Future Volume (vph)	798	2	15	533	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		1	0
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.921	
Flt Protected			0.950		0.980	
Satd. Flow (prot)	1845	0	1805	1827	1715	0
Flt Permitted			0.950		0.980	
Satd. Flow (perm)	1845	0	1805	1827	1715	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	157.7			235.9	145.8	
Travel Time (s)	11.4			17.0	10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	4%	0%	0%
Adj. Flow (vph)	867	2	16	579	5	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	869	0	16	579	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	798	2	15	533	5	6
Future Volume (Veh/h)	798	2	15	533	5	6
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)	867	2	16	579	5	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	278					
pX, platoon unblocked			0.76		0.76	0.76
vC, conflicting volume			869		1479	868
vC1, stage 1 conf vol					868	
vC2, stage 2 conf vol					611	
vCu, unblocked vol			666		1472	665
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 %			98		98	98
cM capacity (veh/h)			706		322	351

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	869	16	579	12
Volume Left	0	16	0	5
Volume Right	2	0	0	7
cSH	1700	706	1700	338
Volume to Capacity	0.51	0.02	0.34	0.04
Queue Length 95th (m)	0.0	0.6	0.0	0.9
Control Delay (s)	0.0	10.2	0.0	16.0
Lane LOS		B		C
Approach Delay (s)	0.0	0.3		16.0
Approach LOS				C

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		52.1%	ICU Level of Service	A
Analysis Period (min)		15		

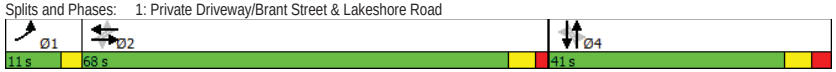
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	641	14	3	1024	92	5	7	0	97	9	270
Future Volume (vph)	153	641	14	3	1024	92	5	7	0	97	9	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	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	0.95	
Frt		0.997			0.988						0.855	
Flt Protected	0.950			0.950				0.981		0.950		
Satd. Flow (prot)	1624	1652	0	1624	3098	0	0	1678	0	1518	1369	0
Flt Permitted	0.168			0.265				0.712		0.749		
Satd. Flow (perm)	286	1652	0	453	3098	0	0	1209	0	1181	1369	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			12						176	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			261.3			72.5			121.7	
Travel Time (s)		11.4			18.8			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 (%)	0%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Adj. Flow (vph)	166	697	15	3	1113	100	5	8	0	105	10	293
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	712	0	3	1213	0	0	13	0	105	303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	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%	
Maximum Green (s)	8.0	62.0		62.0	62.0		34.0	34.0		34.0	34.0	
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							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		None	None		None	None	
Walk Time (s)		11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		16.0		16.0	16.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	73.1	64.3		64.3	64.3			19.6		19.6	19.6	
Actuated g/C Ratio	0.71	0.63		0.63	0.63			0.19		0.19	0.19	
v/c Ratio	0.55	0.69		0.01	0.62			0.06		0.47	0.75	
Control Delay	12.1	18.8		10.3	14.8			32.6		43.1	28.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	12.1	18.8		10.3	14.8			32.6		43.1	28.1	
LOS	B	B		B	B			C		D	C	
Approach Delay		17.6			14.7			32.6			32.0	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	8.2	88.9		0.2	73.8			2.3		19.7	24.9	
Queue Length 95th (m)	22.2	179.5		1.8	129.4			7.3		36.1	56.0	
Internal Link Dist (m)		134.0			237.3			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	308	1034		283	1943			437		427	607	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.54	0.69		0.01	0.62			0.03		0.25	0.50	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 102.8			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 18.6		Intersection LOS: B	
Intersection Capacity Utilization 79.6%		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)	153	641	14	3	1024	92	5	7	0	97	9	270
Future Volume (vph)	153	641	14	3	1024	92	5	7	0	97	9	270
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)	1623	1652		1590	3099			1667		1501	1376	
Flt Permitted	0.17	1.00		0.26	1.00			0.71		0.75	1.00	
Satd. Flow (perm)	287	1652		443	3099			1209		1183	1376	
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)	166	697	15	3	1113	100	5	8	0	105	10	293
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	142	0
Lane Group Flow (vph)	166	712	0	3	1209	0	0	13	0	105	161	0
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
Heavy Vehicles (%)	0%	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)	70.1	62.3		62.3	62.3			16.6		16.6	16.6	
Effective Green, g (s)	70.1	64.3		64.3	64.3			19.6		19.6	19.6	
Actuated g/C Ratio	0.68	0.63		0.63	0.63			0.19		0.19	0.19	
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)	297	1034		277	1940			230		225	262	
v/s Ratio Prot	c0.04	c0.43			0.39						c0.12	
v/s Ratio Perm	0.34			0.01				0.01		0.09		
v/c Ratio	0.56	0.69		0.01	0.62			0.06		0.47	0.61	
Uniform Delay, d1	8.2	12.6		7.2	11.8			34.0		36.9	38.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.3	3.7		0.1	1.5			0.1		1.5	4.2	
Delay (s)	10.5	16.4		7.3	13.3			34.1		38.4	42.3	
Level of Service	B	B		A	B			C		D	D	
Approach Delay (s)		15.2			13.3			34.1			41.3	
Approach LOS		B			B			C			D	

Intersection Summary					
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.66				
Actuated Cycle Length (s)	102.7	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	79.6%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	618	9	5	772	42	18	9	1	18	4	52
Future Volume (vph)	37	618	9	5	772	42	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			0.992			0.996			0.860	
Flt Protected	0.950			0.950				0.969		0.950		
Satd. Flow (prot)	1624	1689	0	1624	3150	0	0	1649	0	1464	1450	0
Flt Permitted	0.314			0.377				0.768		0.864		
Satd. Flow (perm)	532	1689	0	644	3150	0	0	1304	0	1324	1450	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			11			1			57	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		261.3			120.7			256.8			57.7	
Travel Time (s)		18.8			8.7			18.5			4.2	
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%	1%	0%	0%	2%	2%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	40	672	10	5	839	46	20	10	1	20	4	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	682	0	5	885	0	0	31	0	20	61	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		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%	
Maximum Green (s)	83.0	83.0		83.0	83.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		Max	Max		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
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	0.09	0.47		0.01	0.33			0.24		0.15	0.31	
Control Delay	2.4	3.7		2.0	2.4			47.6		45.6	17.4	
Queue Delay	0.0	0.2		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.4	3.9		2.0	2.4			47.6		45.6	17.4	
LOS	A	A		A	A			D		D	B	
Approach Delay		3.8			2.4			47.6			24.4	
Approach LOS		A			A			D			C	
Queue Length 50th (m)	1.2	30.5		0.2	17.0			5.9		3.9	0.8	
Queue Length 95th (m)	3.5	53.4		0.8	26.3			m15.3		11.5	13.2	
Internal Link Dist (m)		237.3			96.7			232.8			33.7	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	457	1452		553	2709			331		336	410	
Starvation Cap Reductn	0	211		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	0.09	0.55		0.01	0.33			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: 0.47			
Intersection Signal Delay: 4.8		Intersection LOS: A	
Intersection Capacity Utilization 52.4%		ICU Level of Service A	

Analysis Period (min) 15

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

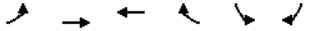
Splits and Phases: 2: Pearl Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	618	9	5	772	42	18	9	1	18	4	52
Future Volume (vph)	37	618	9	5	772	42	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)	1608	1689		1622	3152			1645		1457	1450	
Flt Permitted	0.31	1.00		0.38	1.00			0.77		0.86	1.00	
Satd. Flow (perm)	532	1689		644	3152			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)	40	672	10	5	839	46	20	10	1	20	4	57
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	52	0
Lane Group Flow (vph)	40	682	0	5	883	0	0	30	0	20	9	0
Confl. Peds. (#/hr)	20		3	3		20	2		2	2		2
Heavy Vehicles (%)	0%	1%	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)	448	1422		542	2654			108		110	121	
v/s Ratio Prot		c0.40			0.28						0.01	
v/s Ratio Perm	0.08			0.01				c0.02		0.02		
v/c Ratio	0.09	0.48		0.01	0.33			0.28		0.18	0.07	
Uniform Delay, d1	1.4	2.2		1.4	1.9			46.4		46.0	45.6	
Progression Factor	1.00	1.00		1.00	1.00			1.02		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.0	0.3			1.4		0.8	0.3	
Delay (s)	1.5	2.5		1.4	2.2			48.5		46.8	45.8	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		2.5			2.2			48.5			46.0	
Approach LOS		A			A			D			D	

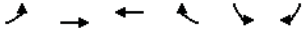
Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	107.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	45	592	804	24	9	15
Future Volume (vph)	45	592	804	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			0.996		0.917	
Flt Protected	0.950				0.981	
Satd. Flow (prot)	1624	1693	1671	0	1538	0
Flt Permitted	0.950				0.981	
Satd. Flow (perm)	1624	1693	1671	0	1538	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	157.7		57.9	
Travel Time (s)		8.7	11.4		4.2	
Confl. Peds. (#/hr)	24			24	1	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%
Adj. Flow (vph)	49	643	874	26	10	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	643	900	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	592	804	24	9	15
Future Volume (Veh/h)	45	592	804	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	643	874	26	10	16
Pedestrians		3	1		24	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		2	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		121				
pX, platoon unblocked					0.90	
vC, conflicting volume	924				1653	914
vC1, stage 1 conf vol					911	
vC2, stage 2 conf vol					742	
vCu, unblocked vol	924				1670	914
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 %	93				97	95
cM capacity (veh/h)	733				295	326

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	49	643	900	26
Volume Left	49	0	0	10
Volume Right	0	0	26	16
cSH	733	1700	1700	313
Volume to Capacity	0.07	0.38	0.53	0.08
Queue Length 95th (m)	1.7	0.0	0.0	2.2
Control Delay (s)	10.3	0.0	0.0	17.5
Lane LOS	B			C
Approach Delay (s)	0.7		0.0	17.5
Approach LOS				C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	600	1	15	820	8	17
Future Volume (vph)	600	1	15	820	8	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		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					0.910	
Flt Protected			0.950		0.984	
Satd. Flow (prot)	1881	0	1752	1863	1668	0
Flt Permitted			0.950		0.984	
Satd. Flow (perm)	1881	0	1752	1863	1668	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	157.7			235.9	145.8	
Travel Time (s)	11.4			17.0	10.5	
Confl. Peds. (#/hr)			1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	25%	3%	2%	0%	3%
Adj. Flow (vph)	652	1	16	891	9	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	653	0	16	891	27	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	53.2%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	600	1	15	820	8	17
Future Volume (Veh/h)	600	1	15	820	8	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	652	1	16	891	9	18
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	278					
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			654		1576	654
vC1, stage 1 conf vol					654	
vC2, stage 2 conf vol					923	
vCu, unblocked vol			580		1583	579
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 %			98		97	96
cM capacity (veh/h)			909		317	471

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	653	16	891	27
Volume Left	0	16	0	9
Volume Right	1	0	0	18
cSH	1700	909	1700	406
Volume to Capacity	0.38	0.02	0.52	0.07
Queue Length 95th (m)	0.0	0.4	0.0	1.7
Control Delay (s)	0.0	9.0	0.0	14.5
Lane LOS		A		B
Approach Delay (s)	0.0	0.2		14.5
Approach LOS				B

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		53.2%	ICU Level of Service	A
Analysis Period (min)		15		

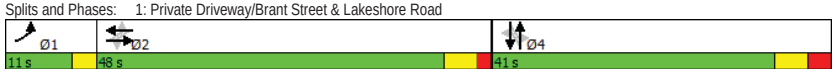
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	1078	9	2	765	173	6	3	4	144	3	204
Future Volume (vph)	233	1078	9	2	765	173	6	3	4	144	3	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	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			0.99		0.99	0.99	
Frt		0.999			0.972			0.961			0.852	
Flt Protected	0.950			0.950				0.976		0.950		
Satd. Flow (prot)	1547	1643	0	1083	2984	0	0	1485	0	1608	1384	0
Flt Permitted	0.202			0.091				0.843		0.748		
Satd. Flow (perm)	328	1643	0	104	2984	0	0	1283	0	1254	1384	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			35			4			222	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			261.3			72.5			121.7	
Travel Time (s)		11.4			18.8			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%	50%	5%	5%	0%	33%	0%	1%	0%	4%
Adj. Flow (vph)	253	1172	10	2	832	188	7	3	4	157	3	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	253	1182	0	2	1020	0	0	14	0	157	225	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	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%	
Maximum Green (s)	8.0	42.0		42.0	42.0		34.0	34.0		34.0	34.0	
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							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		None	None		None	None	
Walk Time (s)		11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		16.0		16.0	16.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	53.2	44.2		44.2	44.2			18.4		18.4	18.4	
Actuated g/C Ratio	0.65	0.54		0.54	0.54			0.23		0.23	0.23	
v/c Ratio	0.76	1.33		0.04	0.63			0.05		0.56	0.47	
Control Delay	24.3	177.7		13.0	15.4			20.4		35.7	7.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	24.3	177.7		13.0	15.4			20.4		35.7	7.3	
LOS	C	F		B	B			C		D	A	
Approach Delay		150.7			15.4			20.4			19.0	
Approach LOS		F			B			C			B	
Queue Length 50th (m)	13.0	~255.9		0.1	54.4			1.3		22.8	0.4	
Queue Length 95th (m)	#45.4	#374.8		1.5	90.5			5.8		41.4	17.0	
Internal Link Dist (m)		134.0			237.3			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	333	889		56	1631			586		570	750	
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	0.76	1.33		0.04	0.63			0.02		0.28	0.30	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 81.6			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.33			
Intersection Signal Delay: 83.9		Intersection LOS: F	
Intersection Capacity Utilization 96.2%		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)	233	1078	9	2	765	173	6	3	4	144	3	204
Future Volume (vph)	233	1078	9	2	765	173	6	3	4	144	3	204
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			0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		0.99	1.00	
Frt	1.00	1.00		1.00	0.97			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)	1546	1642		1083	2988			1486		1596	1384	
Flt Permitted	0.20	1.00		0.09	1.00			0.84		0.75	1.00	
Satd. Flow (perm)	329	1642		103	2988			1284		1257	1384	
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)	253	1172	10	2	832	188	7	3	4	157	3	222
RTOR Reduction (vph)	0	0	0	0	16	0	0	3	0	0	172	0
Lane Group Flow (vph)	253	1182	0	2	1004	0	0	11	0	157	53	0
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
Heavy Vehicles (%)	5%	4%	0%	50%	5%	5%	0%	33%	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)	50.1	42.1		42.1	42.1			15.3		15.3	15.3	
Effective Green, g (s)	50.1	44.1		44.1	44.1			18.3		18.3	18.3	
Actuated g/C Ratio	0.62	0.54		0.54	0.54			0.22		0.22	0.22	
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)	322	889		55	1618			288		282	311	
v/s Ratio Prot	c0.08	c0.72			0.34						0.04	
v/s Ratio Perm	0.41			0.02				0.01		c0.12		
v/c Ratio	0.79	1.33		0.04	0.62			0.04		0.56	0.17	
Uniform Delay, d1	9.1	18.7		8.7	12.9			24.7		28.0	25.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	11.9	155.9		1.2	1.8			0.1		2.4	0.3	
Delay (s)	21.0	174.5		9.9	14.7			24.7		30.3	25.7	
Level of Service	C	F		A	B			C		C	C	
Approach Delay (s)		147.4			14.7			24.7			27.6	
Approach LOS		F			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	83.2	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	96.2%	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	1090	25	1	720	40	25	3	1	15	1	53
Future Volume (vph)	43	1090	25	1	720	40	25	3	1	15	1	53
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	0.335			0.152				0.712		0.737		
Satd. Flow (perm)	567	1656	0	260	3125	0	0	1212	0	1045	1365	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			11			1			58	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		261.3			120.7			256.8			57.7	
Travel Time (s)		18.8			8.7			18.5			4.2	
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	1185	27	1	783	43	27	3	1	16	1	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	1212	0	1	826	0	0	31	0	16	59	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		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%	
Maximum Green (s)	73.0	73.0		73.0	73.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		Max	Max		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	81.9	81.9		81.9	81.9			10.6		10.6	10.6	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.11		0.11	0.11	
v/c Ratio	0.10	0.87		0.00	0.31			0.23		0.14	0.29	
Control Delay	2.6	15.5		2.0	2.5			42.0		40.6	14.9	
Queue Delay	0.0	0.8		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.6	16.3		2.0	2.5			42.0		40.6	14.9	
LOS	A	B		A	A			D		D	B	
Approach Delay		15.8			2.5			42.0			20.4	
Approach LOS		B			A			D			C	
Queue Length 50th (m)	1.4	120.7		0.0	15.5			5.2		2.8	0.2	
Queue Length 95th (m)	4.1	#307.8		0.3	24.4			m11.8		9.0	11.7	
Internal Link Dist (m)		237.3			96.7			232.8			33.7	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	479	1400		219	2644			339		292	423	
Starvation Cap Reductn	0	45		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	0.89		0.00	0.31			0.09		0.05	0.14	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 96.8			
Natural Cycle: 110			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 11.3		Intersection LOS: B	
Intersection Capacity Utilization 81.2%		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.
m Volume for 95th percentile queue is metered by upstream signal.

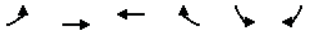
Splits and Phases: 2: Pearl Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1090	25	1	720	40	25	3	1	15	1	53
Future Volume (vph)	43	1090	25	1	720	40	25	3	1	15	1	53
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)	1609	1656		1624	3126			1630		1348	1364	
Flt Permitted	0.33	1.00		0.15	1.00			0.71		0.74	1.00	
Satd. Flow (perm)	567	1656		260	3126			1211		1046	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	1185	27	1	783	43	27	3	1	16	1	58
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	53	0
Lane Group Flow (vph)	47	1212	0	1	824	0	0	30	0	16	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)	79.0	79.0		79.0	79.0			7.0		7.0	7.0	
Effective Green, g (s)	81.0	81.0		81.0	81.0			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)	468	1368		214	2583			111		96	125	
v/s Ratio Prot		c0.73			0.26						0.00	
v/s Ratio Perm	0.08			0.00				c0.02		0.02		
v/c Ratio	0.10	0.89		0.00	0.32			0.27		0.17	0.05	
Uniform Delay, d1	1.6	5.5		1.5	2.0			41.4		41.0	40.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	7.2		0.0	0.3			1.3		0.8	0.2	
Delay (s)	1.7	12.7		1.5	2.3			42.8		41.9	40.8	
Level of Service	A	B		A	A			D		D	D	
Approach Delay (s)		12.3			2.3			42.8			41.0	
Approach LOS		B			A			D			D	

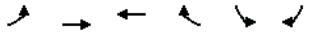
Intersection Summary					
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	98.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	81.2%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	121	991	665	30	39	64
Future Volume (vph)	121	991	665	30	39	64
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	1644	1603	0	1501	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1624	1644	1603	0	1501	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	157.7		57.9	
Travel Time (s)		8.7	11.4		4.2	
Confl. Peds. (#/hr)	22			22		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	6%	7%	0%	4%
Adj. Flow (vph)	132	1077	723	33	42	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	132	1077	756	0	112	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	121	991	665	30	39	64
Future Volume (Veh/h)	121	991	665	30	39	64
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)	132	1077	723	33	42	70
Pedestrians					22	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					2	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		121				
pX, platoon unblocked					0.21	
vC, conflicting volume	778				2102	762
vC1, stage 1 conf vol					762	
vC2, stage 2 conf vol					1341	
vCu, unblocked vol	778				4403	762
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				47	82
cM capacity (veh/h)	832				79	395

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	132	1077	756	112
Volume Left	132	0	0	42
Volume Right	0	0	33	70
cSH	832	1700	1700	158
Volume to Capacity	0.16	0.63	0.44	0.71
Queue Length 95th (m)	4.5	0.0	0.0	33.6
Control Delay (s)	10.1	0.0	0.0	69.3
Lane LOS	B			F
Approach Delay (s)	1.1		0.0	69.3
Approach LOS				F

Intersection Summary				
Average Delay		4.4		
Intersection Capacity Utilization		71.4%	ICU Level of Service	C
Analysis Period (min)		15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1057	29	17	700	6	7
Future Volume (vph)	1057	29	17	700	6	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		1	0
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996				0.928	
Flt Protected			0.950		0.977	
Satd. Flow (prot)	1839	0	1805	1827	1723	0
Flt Permitted			0.950		0.977	
Satd. Flow (perm)	1839	0	1805	1827	1723	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	157.7			235.9	145.8	
Travel Time (s)	11.4			17.0	10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	4%	0%	0%
Adj. Flow (vph)	1149	32	18	761	7	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1181	0	18	761	15	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1057	29	17	700	6	7
Future Volume (Veh/h)	1057	29	17	700	6	7
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)	1149	32	18	761	7	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	278					
pX, platoon unblocked			0.25		0.25	0.25
vC, conflicting volume			1181		1962	1165
vC1, stage 1 conf vol					1165	
vC2, stage 2 conf vol					797	
vCu, unblocked vol			198		3385	133
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 %			95		96	96
cM capacity (veh/h)			340		183	226

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	1181	18	761	15
Volume Left	0	18	0	7
Volume Right	32	0	0	8
cSH	1700	340	1700	204
Volume to Capacity	0.69	0.05	0.45	0.07
Queue Length 95th (m)	0.0	1.3	0.0	1.9
Control Delay (s)	0.0	16.2	0.0	24.1
Lane LOS		C		C
Approach Delay (s)	0.0	0.4		24.1
Approach LOS				C

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		67.4%	ICU Level of Service	C
Analysis Period (min)		15		

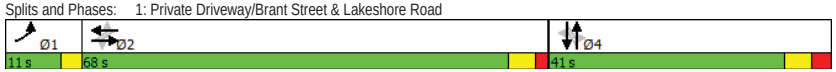
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	835	15	3	1213	162	6	8	0	206	10	379
Future Volume (vph)	226	835	15	3	1213	162	6	8	0	206	10	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (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			0.982						0.854	
Flt Protected	0.950			0.950				0.979		0.950		
Satd. Flow (prot)	1624	1652	0	1624	3072	0	0	1674	0	1518	1366	0
Flt Permitted	0.077			0.077				0.724		0.747		
Satd. Flow (perm)	132	1652	0	132	3072	0	0	1231	0	1178	1366	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			19						154	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			261.3			72.5			121.7	
Travel Time (s)		11.4			18.8			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 (%)	0%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Adj. Flow (vph)	246	908	16	3	1318	176	7	9	0	224	11	412
Shared Lane Traffic (%)												
Lane Group Flow (vph)	246	924	0	3	1494	0	0	16	0	224	423	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	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%	
Maximum Green (s)	8.0	62.0		62.0	62.0		34.0	34.0		34.0	34.0	
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							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		None	None		None	None	
Walk Time (s)		11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		16.0		16.0	16.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	73.3	64.2		64.2	64.2			31.1		31.1	31.1	
Actuated g/C Ratio	0.64	0.56		0.56	0.56			0.27		0.27	0.27	
v/c Ratio	1.30	1.00		0.04	0.86			0.05		0.70	0.88	
Control Delay	194.7	55.5		15.3	28.7			29.9		49.7	44.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	194.7	55.5		15.3	28.7			29.9		49.7	44.7	
LOS	F	E		B	C			C		D	D	
Approach Delay		84.8			28.7			29.9			46.4	
Approach LOS		F			C			C			D	
Queue Length 50th (m)	~59.9	~241.3		0.3	160.8			2.8		47.3	63.7	
Queue Length 95th (m)	#115.6	#330.3		2.2	#211.3			8.4		76.2	#117.8	
Internal Link Dist (m)		134.0			237.3			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	189	928		74	1733			399		382	547	
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	1.30	1.00		0.04	0.86			0.04		0.59	0.77	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 114.4			
Natural Cycle: 130			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.30			
Intersection Signal Delay: 51.8		Intersection LOS: D	
Intersection Capacity Utilization 96.6%		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)	226	835	15	3	1213	162	6	8	0	206	10	379
Future Volume (vph)	226	835	15	3	1213	162	6	8	0	206	10	379
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			0.99		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)	1624	1653		1624	3074			1664		1499	1369	
Flt Permitted	0.08	1.00		0.08	1.00			0.72		0.75	1.00	
Satd. Flow (perm)	131	1653		132	3074			1231		1179	1369	
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)	246	908	16	3	1318	176	7	9	0	224	11	412
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	112	0
Lane Group Flow (vph)	246	924	0	3	1486	0	0	16	0	224	311	0
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
Heavy Vehicles (%)	0%	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)	70.2	62.2		62.2	62.2			28.1		28.1	28.1	
Effective Green, g (s)	70.2	64.2		64.2	64.2			31.1		31.1	31.1	
Actuated g/C Ratio	0.61	0.56		0.56	0.56			0.27		0.27	0.27	
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)	184	928		74	1726			334		320	372	
v/s Ratio Prot	c0.09	0.56			0.48						c0.23	
v/s Ratio Perm	c0.72			0.02				0.01		0.19		
v/c Ratio	1.34	1.00		0.04	0.86			0.05		0.70	0.84	
Uniform Delay, d1	29.2	24.9		11.2	21.3			30.7		37.4	39.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	183.7	28.4		1.0	5.9			0.1		6.6	14.9	
Delay (s)	212.9	53.3		12.3	27.1			30.7		44.0	54.1	
Level of Service	F	D		B	C			C		D	D	
Approach Delay (s)		86.9			27.1			30.7			50.6	
Approach LOS		F			C			C			D	

Intersection Summary					
HCM 2000 Control Delay	52.7	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	1.16				
Actuated Cycle Length (s)	114.3	Sum of lost time (s)	11.0		
Intersection Capacity Utilization	96.6%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	893	10	6	983	59	36	10	1	37	4	57
Future Volume (vph)	44	893	10	6	983	59	36	10	1	37	4	57
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	
Frt		0.998			0.992			0.997			0.859	
Flt Protected	0.950			0.950				0.963		0.950		
Satd. Flow (prot)	1624	1689	0	1624	3149	0	0	1641	0	1464	1448	0
Flt Permitted	0.237			0.244				0.733		0.776		
Satd. Flow (perm)	403	1689	0	417	3149	0	0	1246	0	1190	1448	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			12			1			62	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		261.3			120.7			256.8			57.7	
Travel Time (s)		18.8			8.7			18.5			4.2	
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%	1%	0%	0%	2%	2%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	48	971	11	7	1068	64	39	11	1	40	4	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	982	0	7	1132	0	0	51	0	40	66	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		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%	
Maximum Green (s)	83.0	83.0		83.0	83.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		Max	Max		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	88.9	88.9		88.9	88.9			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	0.14	0.69		0.02	0.43			0.36		0.30	0.30	
Control Delay	3.5	7.6		2.5	3.3			48.3		48.6	15.9	
Queue Delay	0.0	0.5		0.0	0.0			0.0		0.0	0.0	
Total Delay	3.5	8.1		2.5	3.3			48.3		48.6	15.9	
LOS	A	A		A	A			D		D	B	
Approach Delay		7.9			3.3			48.3			28.2	
Approach LOS		A			A			D			C	
Queue Length 50th (m)	1.6	69.5		0.2	27.2			10.2		8.0	0.8	
Queue Length 95th (m)	5.4	140.0		1.2	44.9			m19.3		18.8	13.6	
Internal Link Dist (m)		237.3			96.7			232.8			33.7	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	340	1428		352	2663			321		305	418	
Starvation Cap Reductn	0	138		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	0.14	0.76		0.02	0.43			0.16		0.13	0.16	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 105.1			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 7.5		Intersection LOS: A	
Intersection Capacity Utilization 69.7%		ICU Level of Service C	

Analysis Period (min) 15

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

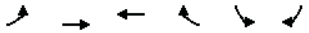
Splits and Phases: 2: Pearl Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	893	10	6	983	59	36	10	1	37	4	57
Future Volume (vph)	44	893	10	6	983	59	36	10	1	37	4	57
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)	1614	1690		1623	3149			1639		1457	1449	
Flt Permitted	0.24	1.00		0.24	1.00			0.73		0.78	1.00	
Satd. Flow (perm)	402	1690		417	3149			1247		1191	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)	48	971	11	7	1068	64	39	11	1	40	4	62
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	56	0
Lane Group Flow (vph)	48	982	0	7	1130	0	0	50	0	40	10	0
Confl. Peds. (#/hr)	20		3	3		20	2		2	2		2
Heavy Vehicles (%)	0%	1%	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)	86.1	86.1		86.1	86.1			8.3		8.3	8.3	
Effective Green, g (s)	88.1	88.1		88.1	88.1			10.3		10.3	10.3	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.10		0.10	0.10	
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)	332	1399		345	2607			120		115	140	
v/s Ratio Prot		c0.58			0.36						0.01	
v/s Ratio Perm	0.12			0.02				c0.04		0.03		
v/c Ratio	0.14	0.70		0.02	0.43			0.42		0.35	0.07	
Uniform Delay, d1	1.8	3.8		1.6	2.5			45.2		44.9	43.7	
Progression Factor	1.00	1.00		1.00	1.00			0.97		1.00	1.00	
Incremental Delay, d2	0.2	1.6		0.1	0.5			2.3		1.8	0.2	
Delay (s)	2.0	5.4		1.7	3.0			46.1		46.7	43.9	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		5.2			3.0			46.1			45.0	
Approach LOS		A			A			D			D	

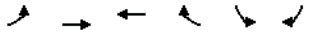
Intersection Summary				
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	106.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	69.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	98	800	995	62	26	36
Future Volume (vph)	98	800	995	62	26	36
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			0.992		0.921	
Flt Protected	0.950				0.980	
Satd. Flow (prot)	1624	1693	1665	0	1543	0
Flt Permitted	0.950				0.980	
Satd. Flow (perm)	1624	1693	1665	0	1543	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	157.7		57.9	
Travel Time (s)		8.7	11.4		4.2	
Confl. Peds. (#/hr)	24			24	1	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%
Adj. Flow (vph)	107	870	1082	67	28	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	870	1149	0	67	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	98	800	995	62	26	36
Future Volume (Veh/h)	98	800	995	62	26	36
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)	107	870	1082	67	28	39
Pedestrians		3	1		24	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		2	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		121				
pX, platoon unblocked					0.76	
vC, conflicting volume	1173				2224	1142
vC1, stage 1 conf vol					1140	
vC2, stage 2 conf vol					1085	
vCu, unblocked vol	1173				2455	1142
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 %	82				84	84
cM capacity (veh/h)	591				177	241

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	107	870	1149	67
Volume Left	107	0	0	28
Volume Right	0	0	67	39
cSH	591	1700	1700	209
Volume to Capacity	0.18	0.51	0.68	0.32
Queue Length 95th (m)	5.3	0.0	0.0	10.5
Control Delay (s)	12.4	0.0	0.0	30.1
Lane LOS	B			D
Approach Delay (s)	1.4		0.0	30.1
Approach LOS				D

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	817	17	17	1078	9	19
Future Volume (vph)	817	17	17	1078	9	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		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				0.909	
Flt Protected			0.950		0.984	
Satd. Flow (prot)	1867	0	1752	1863	1666	0
Flt Permitted			0.950		0.984	
Satd. Flow (perm)	1867	0	1752	1863	1666	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	157.7			235.9	145.8	
Travel Time (s)	11.4			17.0	10.5	
Confl. Peds. (#/hr)			1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	25%	3%	2%	0%	3%
Adj. Flow (vph)	888	18	18	1172	10	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	906	0	18	1172	31	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	817	17	17	1078	9	19
Future Volume (Veh/h)	817	17	17	1078	9	19
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)	888	18	18	1172	10	21
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	278					
pX, platoon unblocked			0.76		0.76	0.76
vC, conflicting volume			907		2106	898
vC1, stage 1 conf vol					898	
vC2, stage 2 conf vol					1208	
vCu, unblocked vol			717		2300	706
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 %			97		95	94
cM capacity (veh/h)			665		216	329

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	906	18	1172	31
Volume Left	0	18	0	10
Volume Right	18	0	0	21
cSH	1700	665	1700	281
Volume to Capacity	0.53	0.03	0.69	0.11
Queue Length 95th (m)	0.0	0.7	0.0	2.9
Control Delay (s)	0.0	10.6	0.0	19.4
Lane LOS		B		C
Approach Delay (s)	0.0	0.2		19.4
Approach LOS				C

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		66.7%	ICU Level of Service	C
Analysis Period (min)		15		

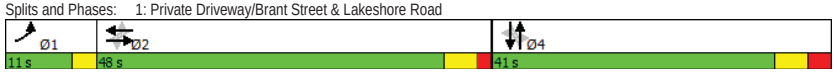
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	1084	9	2	779	178	6	3	4	146	3	204
Future Volume (vph)	233	1084	9	2	779	178	6	3	4	146	3	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	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			0.99		0.99	0.99	
Frt		0.999			0.972			0.961			0.852	
Flt Protected	0.950			0.950				0.976		0.950		
Satd. Flow (prot)	1547	1643	0	1083	2984	0	0	1485	0	1608	1384	0
Flt Permitted	0.194			0.091				0.844		0.748		
Satd. Flow (perm)	315	1643	0	104	2984	0	0	1284	0	1254	1384	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			35			4			222	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			261.3			72.5			121.7	
Travel Time (s)		11.4			18.8			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%	50%	5%	5%	0%	33%	0%	1%	0%	4%
Adj. Flow (vph)	253	1178	10	2	847	193	7	3	4	159	3	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	253	1188	0	2	1040	0	0	14	0	159	225	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	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%	
Maximum Green (s)	8.0	42.0		42.0	42.0		34.0	34.0		34.0	34.0	
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							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		None	None		None	None	
Walk Time (s)		11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		16.0		16.0	16.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	53.2	44.2		44.2	44.2			18.5		18.5	18.5	
Actuated g/C Ratio	0.65	0.54		0.54	0.54			0.23		0.23	0.23	
v/c Ratio	0.78	1.34		0.04	0.64			0.05		0.56	0.46	
Control Delay	26.5	181.4		13.0	15.8			20.3		35.8	7.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	26.5	181.4		13.0	15.8			20.3		35.8	7.3	
LOS	C	F		B	B			C		D	A	
Approach Delay		154.2			15.7			20.3			19.1	
Approach LOS		F			B			C			B	
Queue Length 50th (m)	13.0	~258.6		0.1	56.3			1.3		23.1	0.4	
Queue Length 95th (m)	#46.8	#378.3		1.5	93.5			5.8		42.0	17.0	
Internal Link Dist (m)		134.0			237.3			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	326	888		56	1629			585		570	750	
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	0.78	1.34		0.04	0.64			0.02		0.28	0.30	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 81.7			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.34			
Intersection Signal Delay: 85.5		Intersection LOS: F	
Intersection Capacity Utilization 96.7%		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)	233	1084	9	2	779	178	6	3	4	146	3	204
Future Volume (vph)	233	1084	9	2	779	178	6	3	4	146	3	204
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			0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		0.99	1.00	
Frt	1.00	1.00		1.00	0.97			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)	1546	1642		1083	2987			1486		1596	1384	
Flt Permitted	0.19	1.00		0.09	1.00			0.84		0.75	1.00	
Satd. Flow (perm)	316	1642		103	2987			1285		1257	1384	
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)	253	1178	10	2	847	193	7	3	4	159	3	222
RTOR Reduction (vph)	0	0	0	0	16	0	0	3	0	0	172	0
Lane Group Flow (vph)	253	1188	0	2	1024	0	0	11	0	159	53	0
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
Heavy Vehicles (%)	5%	4%	0%	50%	5%	5%	0%	33%	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)	50.1	42.1		42.1	42.1			15.5		15.5	15.5	
Effective Green, g (s)	50.1	44.1		44.1	44.1			18.5		18.5	18.5	
Actuated g/C Ratio	0.61	0.54		0.54	0.54			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)	314	887		55	1614			291		284	313	
v/s Ratio Prot	c0.08	c0.72			0.34						0.04	
v/s Ratio Perm	0.41			0.02				0.01		c0.13		
v/c Ratio	0.81	1.34		0.04	0.63			0.04		0.56	0.17	
Uniform Delay, d1	9.4	18.7		8.8	13.1			24.6		27.9	25.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	13.9	160.1		1.2	1.9			0.1		2.4	0.3	
Delay (s)	23.4	178.9		10.0	15.0			24.7		30.3	25.6	
Level of Service	C	F		B	B			C		C	C	
Approach Delay (s)		151.6			15.0			24.7			27.6	
Approach LOS		F			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	85.0	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	96.7%	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)	43	1090	33	2	720	40	45	7	3	15	2	53
Future Volume (vph)	43	1090	33	2	720	40	45	7	3	15	2	53
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		0.996			0.992			0.993			0.855	
Flt Protected	0.950			0.950				0.961		0.950		
Satd. Flow (prot)	1624	1655	0	1624	3125	0	0	1630	0	1354	1369	0
Flt Permitted	0.332			0.136				0.724		0.769		
Satd. Flow (perm)	562	1655	0	233	3125	0	0	1228	0	1091	1369	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			11			2			58	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		261.3			120.7			256.8			57.7	
Travel Time (s)		18.8			8.7			18.5			4.2	
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	1185	36	2	783	43	49	8	3	16	2	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	1221	0	2	826	0	0	60	0	16	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		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%	
Maximum Green (s)	73.0	73.0		73.0	73.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		Max	Max		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	80.0	80.0		80.0	80.0			12.1		12.1	12.1	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.13		0.13	0.13	
v/c Ratio	0.10	0.89		0.01	0.32			0.38		0.12	0.27	
Control Delay	3.3	18.8		3.0	3.1			43.8		38.4	14.1	
Queue Delay	0.0	1.1		0.0	0.0			0.0		0.0	0.0	
Total Delay	3.3	19.9		3.0	3.1			43.8		38.4	14.1	
LOS	A	B		A	A			D		D	B	
Approach Delay		19.3			3.1			43.8			19.2	
Approach LOS		B			A			D			B	
Queue Length 50th (m)	1.5	139.8		0.1	17.4			10.2		2.8	0.4	
Queue Length 95th (m)	5.1	#331.7		0.6	30.3			m19.0		9.0	11.7	
Internal Link Dist (m)		237.3			96.7			232.8			33.7	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	466	1373		193	2594			345		305	425	
Starvation Cap Reductn	0	43		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	0.92		0.01	0.32			0.17		0.05	0.14	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 96.4			
Natural Cycle: 110			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 83.2%		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.

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

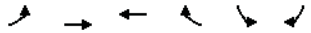
Splits and Phases: 2: Pearl Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1090	33	2	720	40	45	7	3	15	2	53
Future Volume (vph)	43	1090	33	2	720	40	45	7	3	15	2	53
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			0.99		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1609	1654		1624	3126			1630		1349	1369	
Flt Permitted	0.33	1.00		0.14	1.00			0.72		0.77	1.00	
Satd. Flow (perm)	563	1654		233	3126			1229		1091	1369	
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	1185	36	2	783	43	49	8	3	16	2	58
RTOR Reduction (vph)	0	1	0	0	2	0	0	2	0	0	52	0
Lane Group Flow (vph)	47	1220	0	2	824	0	0	58	0	16	8	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)	77.1	77.1		77.1	77.1			8.5		8.5	8.5	
Effective Green, g (s)	79.1	79.1		79.1	79.1			10.5		10.5	10.5	
Actuated g/C Ratio	0.81	0.81		0.81	0.81			0.11		0.11	0.11	
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)	456	1340		188	2533			132		117	147	
v/s Ratio Prot		c0.74			0.26						0.01	
v/s Ratio Perm	0.08			0.01				c0.05		0.01		
v/c Ratio	0.10	0.91		0.01	0.33			0.44		0.14	0.06	
Uniform Delay, d1	1.9	6.7		1.8	2.4			40.8		39.4	39.1	
Progression Factor	1.00	1.00		1.00	1.00			0.98		1.00	1.00	
Incremental Delay, d2	0.1	9.5		0.1	0.3			2.3		0.5	0.2	
Delay (s)	2.0	16.2		1.9	2.7			42.4		40.0	39.3	
Level of Service	A	B		A	A			D		D	D	
Approach Delay (s)		15.7			2.7			42.4			39.4	
Approach LOS		B			A			D			D	

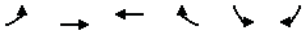
Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	123	991	665	30	39	65
Future Volume (vph)	123	991	665	30	39	65
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		0.915	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1624	1644	1603	0	1499	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1624	1644	1603	0	1499	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	157.7		57.9	
Travel Time (s)		8.7	11.4		4.2	
Confl. Peds. (#/hr)	22			22		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	6%	7%	0%	4%
Adj. Flow (vph)	134	1077	723	33	42	71
Shared Lane Traffic (%)						
Lane Group Flow (vph)	134	1077	756	0	113	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	123	991	665	30	39	65
Future Volume (Veh/h)	123	991	665	30	39	65
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)	134	1077	723	33	42	71
Pedestrians					22	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					2	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		121				
pX, platoon unblocked					0.22	
vC, conflicting volume	778				2106	762
vC1, stage 1 conf vol					762	
vC2, stage 2 conf vol					1345	
vCu, unblocked vol	778				4202	762
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				47	82
cM capacity (veh/h)	832				79	395

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	134	1077	756	113
Volume Left	134	0	0	42
Volume Right	0	0	33	71
cSH	832	1700	1700	159
Volume to Capacity	0.16	0.63	0.44	0.71
Queue Length 95th (m)	4.6	0.0	0.0	34.0
Control Delay (s)	10.2	0.0	0.0	70.0
Lane LOS	B			F
Approach Delay (s)	1.1		0.0	70.0
Approach LOS				F

Intersection Summary				
Average Delay		4.5		
Intersection Capacity Utilization		71.5%	ICU Level of Service	C
Analysis Period (min)		15		

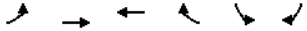
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1057	29	21	700	6	18
Future Volume (vph)	1057	29	21	700	6	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		1	0
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996				0.900	
Flt Protected			0.950		0.987	
Satd. Flow (prot)	1839	0	1805	1827	1688	0
Flt Permitted			0.950		0.987	
Satd. Flow (perm)	1839	0	1805	1827	1688	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	157.7			235.9	145.8	
Travel Time (s)	11.4			17.0	10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	4%	0%	0%
Adj. Flow (vph)	1149	32	23	761	7	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1181	0	23	761	27	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.4%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1057	29	21	700	6	18
Future Volume (Veh/h)	1057	29	21	700	6	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)	1149	32	23	761	7	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	278					
pX, platoon unblocked			0.26		0.26	0.26
vC, conflicting volume			1181		1972	1165
vC1, stage 1 conf vol					1165	
vC2, stage 2 conf vol					807	
vCu, unblocked vol			286		3296	225
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 %			93		96	91
cM capacity (veh/h)			338		178	215

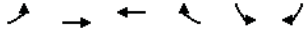
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	1181	23	761	27
Volume Left	0	23	0	7
Volume Right	32	0	0	20
cSH	1700	338	1700	204
Volume to Capacity	0.69	0.07	0.45	0.13
Queue Length 95th (m)	0.0	1.7	0.0	3.6
Control Delay (s)	0.0	16.4	0.0	25.3
Lane LOS		C		D
Approach Delay (s)	0.0	0.5		25.3
Approach LOS				D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	12	46	4	11	25
Future Volume (vph)	10	12	46	4	11	25
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			0.990		0.907	
Flt Protected		0.978			0.985	
Satd. Flow (prot)	0	1822	1844	0	1664	0
Flt Permitted		0.978			0.985	
Satd. Flow (perm)	0	1822	1844	0	1664	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		256.8	145.8		58.8	
Travel Time (s)		18.5	10.5		4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	13	50	4	12	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	24	54	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	17.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	12	46	4	11	25
Future Volume (Veh/h)	10	12	46	4	11	25
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)	11	13	50	4	12	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		257				
pX, platoon unblocked						
vC, conflicting volume	54				87	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	54				87	52
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	97
cM capacity (veh/h)	1551				908	1016

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	24	54	39
Volume Left	11	0	12
Volume Right	0	4	27
cSH	1551	1700	980
Volume to Capacity	0.01	0.03	0.04
Queue Length 95th (m)	0.2	0.0	1.0
Control Delay (s)	3.4	0.0	8.8
Lane LOS	A		A
Approach Delay (s)	3.4	0.0	8.8
Approach LOS			A

Intersection Summary				
Average Delay		3.6		
Intersection Capacity Utilization		17.9%	ICU Level of Service	A
Analysis Period (min)		15		

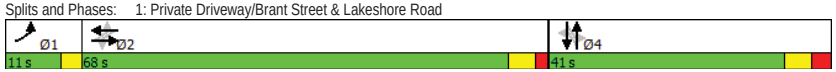
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	848	15	3	1224	166	6	8	0	211	10	379
Future Volume (vph)	226	848	15	3	1224	166	6	8	0	211	10	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (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			0.982						0.854	
Flt Protected	0.950			0.950				0.979		0.950		
Satd. Flow (prot)	1624	1652	0	1624	3071	0	0	1674	0	1518	1366	0
Flt Permitted	0.073			0.068				0.724		0.747		
Satd. Flow (perm)	125	1652	0	116	3071	0	0	1231	0	1178	1366	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			19						153	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			261.3			72.5			121.7	
Travel Time (s)		11.4			18.8			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 (%)	0%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Adj. Flow (vph)	246	922	16	3	1330	180	7	9	0	229	11	412
Shared Lane Traffic (%)												
Lane Group Flow (vph)	246	938	0	3	1510	0	0	16	0	229	423	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	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%	
Maximum Green (s)	8.0	62.0		62.0	62.0		34.0	34.0		34.0	34.0	
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							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		None	None		None	None	
Walk Time (s)		11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		16.0		16.0	16.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	73.2	64.2		64.2	64.2			31.1		31.1	31.1	
Actuated g/C Ratio	0.64	0.56		0.56	0.56			0.27		0.27	0.27	
v/c Ratio	1.34	1.01		0.05	0.87			0.05		0.72	0.88	
Control Delay	207.7	59.5		15.7	29.4			29.9		50.6	44.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	207.7	59.5		15.7	29.4			29.9		50.6	44.8	
LOS	F	E		B	C			C		D	D	
Approach Delay		90.3			29.4			29.9			46.8	
Approach LOS		F			C			C			D	
Queue Length 50th (m)	~62.0	~248.9		0.3	164.8			2.8		48.7	64.0	
Queue Length 95th (m)	#117.6	#338.2		2.2	#221.2			8.4		78.1	#118.2	
Internal Link Dist (m)		134.0			237.3			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	184	927		64	1731			399		382	546	
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	1.34	1.01		0.05	0.87			0.04		0.60	0.77	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 114.4			
Natural Cycle: 130			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.34			
Intersection Signal Delay: 54.2		Intersection LOS: D	
Intersection Capacity Utilization 97.0%		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)	226	848	15	3	1224	166	6	8	0	211	10	379
Future Volume (vph)	226	848	15	3	1224	166	6	8	0	211	10	379
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			0.99		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)	1624	1653		1624	3073			1664		1499	1369	
Flt Permitted	0.07	1.00		0.07	1.00			0.72		0.75	1.00	
Satd. Flow (perm)	125	1653		116	3073			1231		1179	1369	
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)	246	922	16	3	1330	180	7	9	0	229	11	412
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	111	0
Lane Group Flow (vph)	246	938	0	3	1502	0	0	16	0	229	312	0
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
Heavy Vehicles (%)	0%	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)	70.2	62.2		62.2	62.2			28.1		28.1	28.1	
Effective Green, g (s)	70.2	64.2		64.2	64.2			31.1		31.1	31.1	
Actuated g/C Ratio	0.61	0.56		0.56	0.56			0.27		0.27	0.27	
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)	181	928		65	1726			334		320	372	
v/s Ratio Prot	c0.09	0.57			0.49						c0.23	
v/s Ratio Perm	c0.73			0.03				0.01		0.19		
v/c Ratio	1.36	1.01		0.05	0.87			0.05		0.72	0.84	
Uniform Delay, d1	30.0	25.0		11.3	21.5			30.7		37.6	39.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	193.1	32.1		1.3	6.3			0.1		7.4	15.1	
Delay (s)	223.1	57.2		12.6	27.8			30.7		45.0	54.3	
Level of Service	F	E		B	C			C		D	D	
Approach Delay (s)		91.6			27.7			30.7			51.0	
Approach LOS		F			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	54.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.17			
Actuated Cycle Length (s)	114.3	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	97.0%	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)	44	891	29	8	981	59	53	13	2	37	8	57
Future Volume (vph)	44	891	29	8	981	59	53	13	2	37	8	57
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	
Frt		0.995			0.992			0.996			0.869	
Flt Protected	0.950			0.950				0.962		0.950		
Satd. Flow (prot)	1624	1684	0	1624	3149	0	0	1637	0	1464	1466	0
Flt Permitted	0.235			0.229				0.725		0.746		
Satd. Flow (perm)	399	1684	0	392	3149	0	0	1231	0	1144	1466	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			12			1			62	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		261.3			120.7			256.8			57.7	
Travel Time (s)		18.8			8.7			18.5			4.2	
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%	1%	0%	0%	2%	2%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	48	968	32	9	1066	64	58	14	2	40	9	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	1000	0	9	1130	0	0	74	0	40	71	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		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%	
Maximum Green (s)	83.0	83.0		83.0	83.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		Max	Max		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	89.0	89.0		89.0	89.0			13.7		13.7	13.7	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.13		0.13	0.13	
v/c Ratio	0.15	0.71		0.03	0.43			0.47		0.27	0.29	
Control Delay	4.2	9.4		3.2	3.9			51.5		46.5	16.2	
Queue Delay	0.0	0.6		0.0	0.0			0.0		0.0	0.0	
Total Delay	4.2	10.0		3.2	3.9			51.5		46.5	16.2	
LOS	A	A		A	A			D		D	B	
Approach Delay		9.7			3.9			51.5			27.1	
Approach LOS		A			A			D			C	
Queue Length 50th (m)	1.9	84.0		0.3	31.3			15.2		8.0	1.8	
Queue Length 95th (m)	6.3	175.1		1.7	53.2			m28.4		18.7	14.9	
Internal Link Dist (m)		237.3			96.7			232.8			33.7	
Turn Bay Length (m)	40.0			20.0						7.0		
Base Capacity (vph)	331	1400		326	2620			311		289	416	
Starvation Cap Reductn	0	130		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	0.15	0.79		0.03	0.43			0.24		0.14	0.17	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 107			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 9.1		Intersection LOS: A	
Intersection Capacity Utilization 72.0%		ICU Level of Service C	

Analysis Period (min) 15

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

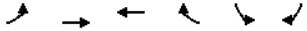
Splits and Phases: 2: Pearl Street & Lakeshore Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	891	29	8	981	59	53	13	2	37	8	57
Future Volume (vph)	44	891	29	8	981	59	53	13	2	37	8	57
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	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1614	1684		1623	3149			1635		1458	1467	
Flt Permitted	0.23	1.00		0.23	1.00			0.73		0.75	1.00	
Satd. Flow (perm)	399	1684		391	3149			1232		1145	1467	
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	968	32	9	1066	64	58	14	2	40	9	62
RTOR Reduction (vph)	0	1	0	0	2	0	0	1	0	0	55	0
Lane Group Flow (vph)	48	999	0	9	1128	0	0	73	0	40	16	0
Confl. Peds. (#/hr)	20		3	3		20	2		2	2		2
Heavy Vehicles (%)	0%	1%	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)	86.1	86.1		86.1	86.1			10.1		10.1	10.1	
Effective Green, g (s)	88.1	88.1		88.1	88.1			12.1		12.1	12.1	
Actuated g/C Ratio	0.81	0.81		0.81	0.81			0.11		0.11	0.11	
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)	324	1371		318	2564			137		128	164	
v/s Ratio Prot		c0.59			0.36						0.01	
v/s Ratio Perm	0.12			0.02				c0.06		0.03		
v/c Ratio	0.15	0.73		0.03	0.44			0.53		0.31	0.10	
Uniform Delay, d1	2.1	4.6		1.9	2.9			45.4		44.2	43.1	
Progression Factor	1.00	1.00		1.00	1.00			0.98		1.00	1.00	
Incremental Delay, d2	0.2	2.0		0.2	0.6			3.9		1.4	0.3	
Delay (s)	2.3	6.6		2.1	3.5			48.5		45.6	43.4	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		6.4			3.4			48.5			44.2	
Approach LOS		A			A			D			D	

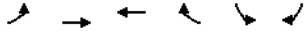
Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	108.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	99	798	993	62	26	38
Future Volume (vph)	99	798	993	62	26	38
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			0.992		0.920	
Flt Protected	0.950				0.980	
Satd. Flow (prot)	1624	1693	1665	0	1542	0
Flt Permitted	0.950				0.980	
Satd. Flow (perm)	1624	1693	1665	0	1542	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		120.7	157.7		57.9	
Travel Time (s)		8.7	11.4		4.2	
Confl. Peds. (#/hr)	24			24	1	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%
Adj. Flow (vph)	108	867	1079	67	28	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	867	1146	0	69	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	99	798	993	62	26	38
Future Volume (Veh/h)	99	798	993	62	26	38
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)	108	867	1079	67	28	41
Pedestrians		3	1		24	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		2	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		121				
pX, platoon unblocked					0.73	
vC, conflicting volume	1170				2220	1140
vC1, stage 1 conf vol					1136	
vC2, stage 2 conf vol					1084	
vCu, unblocked vol	1170				2488	1140
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 %	82				84	83
cM capacity (veh/h)	592				175	241

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	108	867	1146	69
Volume Left	108	0	0	28
Volume Right	0	0	67	41
cSH	592	1700	1700	209
Volume to Capacity	0.18	0.51	0.67	0.33
Queue Length 95th (m)	5.3	0.0	0.0	10.9
Control Delay (s)	12.4	0.0	0.0	30.4
Lane LOS	B			D
Approach Delay (s)	1.4		0.0	30.4
Approach LOS				D

Intersection Summary				
Average Delay		1.6		
Intersection Capacity Utilization		83.7%	ICU Level of Service	E
Analysis Period (min)		15		

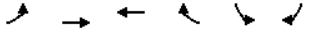
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	815	17	28	1076	9	29
Future Volume (vph)	815	17	28	1076	9	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		1	0
Taper Length (m)			7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.997				0.897	
Flt Protected			0.950		0.988	
Satd. Flow (prot)	1867	0	1752	1863	1646	0
Flt Permitted			0.950		0.988	
Satd. Flow (perm)	1867	0	1752	1863	1646	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	157.7			235.9	145.8	
Travel Time (s)	11.4			17.0	10.5	
Confl. Peds. (#/hr)			1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	25%	3%	2%	0%	3%
Adj. Flow (vph)	886	18	30	1170	10	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	904	0	30	1170	42	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	815	17	28	1076	9	29
Future Volume (Veh/h)	815	17	28	1076	9	29
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)	886	18	30	1170	10	32
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	278					
pX, platoon unblocked			0.73		0.73	0.73
vC, conflicting volume			905		2126	896
vC1, stage 1 conf vol					896	
vC2, stage 2 conf vol					1230	
vCu, unblocked vol			687		2355	675
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 %			95		95	90
cM capacity (veh/h)			660		209	331

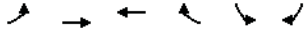
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	904	30	1170	42
Volume Left	0	30	0	10
Volume Right	18	0	0	32
cSH	1700	660	1700	290
Volume to Capacity	0.53	0.05	0.69	0.14
Queue Length 95th (m)	0.0	1.1	0.0	4.0
Control Delay (s)	0.0	10.7	0.0	19.5
Lane LOS		B		C
Approach Delay (s)	0.0	0.3		19.5
Approach LOS				C

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization		66.6%	ICU Level of Service	C
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	28	34	11	10	21
Future Volume (vph)	25	28	34	11	10	21
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			0.967		0.909	
Flt Protected		0.977			0.984	
Satd. Flow (prot)	0	1820	1801	0	1666	0
Flt Permitted		0.977			0.984	
Satd. Flow (perm)	0	1820	1801	0	1666	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		256.8	145.8		58.8	
Travel Time (s)		18.5	10.5		4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	30	37	12	11	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	57	49	0	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

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



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	28	34	11	10	21
Future Volume (Veh/h)	25	28	34	11	10	21
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)	27	30	37	12	11	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		257				
pX, platoon unblocked						
vC, conflicting volume	49				127	43
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	49				127	43
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1558				853	1027

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	57	49	34
Volume Left	27	0	11
Volume Right	0	12	23
cSH	1558	1700	963
Volume to Capacity	0.02	0.03	0.04
Queue Length 95th (m)	0.4	0.0	0.9
Control Delay (s)	3.6	0.0	8.9
Lane LOS	A		A
Approach Delay (s)	3.6	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix F

SimTraffic

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	2585	2576	2513	2565	2557	2600	2607
Vehs Exited	2602	2584	2523	2551	2558	2594	2625
Starting Vehs	76	73	66	59	62	62	67
Ending Vehs	59	65	56	73	61	68	49
Travel Distance (km)	1755	1743	1695	1712	1721	1778	1741
Travel Time (hr)	316.1	381.0	336.7	284.5	322.8	286.9	296.7
Total Delay (hr)	278.7	344.1	300.7	248.0	286.2	249.2	259.8
Total Stops	2642	2570	2579	2546	2533	2660	2598
Fuel Used (l)	387.2	443.8	402.0	357.1	391.3	362.7	371.8

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	2560	2533	2526	2559
Vehs Exited	2553	2524	2549	2567
Starting Vehs	58	60	73	62
Ending Vehs	65	69	50	56
Travel Distance (km)	1716	1721	1689	1727
Travel Time (hr)	340.5	371.9	335.8	327.3
Total Delay (hr)	304.0	335.4	299.8	290.6
Total Stops	2595	2537	2527	2579
Fuel Used (l)	406.5	432.8	400.9	395.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:12
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	2585	2576	2513	2565	2557	2600	2607
Vehs Exited	2602	2584	2523	2551	2558	2594	2625
Starting Vehs	76	73	66	59	62	62	67
Ending Vehs	59	65	56	73	61	68	49
Travel Distance (km)	1755	1743	1695	1712	1721	1778	1741
Travel Time (hr)	316.1	381.0	336.7	284.5	322.8	286.9	296.7
Total Delay (hr)	278.7	344.1	300.7	248.0	286.2	249.2	259.8
Total Stops	2642	2570	2579	2546	2533	2660	2598
Fuel Used (l)	387.2	443.8	402.0	357.1	391.3	362.7	371.8

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	2560	2533	2526	2559
Vehs Exited	2553	2524	2549	2567
Starting Vehs	58	60	73	62
Ending Vehs	65	69	50	56
Travel Distance (km)	1716	1721	1689	1727
Travel Time (hr)	340.5	371.9	335.8	327.3
Total Delay (hr)	304.0	335.4	299.8	290.6
Total Stops	2595	2537	2527	2579
Fuel Used (l)	406.5	432.8	400.9	395.6

Intersection: 1: Private Driveway/Brant Street & Lakeshore Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	62.4	165.4	14.7	87.2	92.5	16.2	74.9	22.5
Average Queue (m)	47.7	155.8	0.7	40.4	47.9	3.0	35.0	20.2
95th Queue (m)	81.3	162.8	7.5	71.1	78.9	10.9	64.3	26.7
Link Distance (m)		147.9		237.5	237.5	60.8	107.9	
Upstream Blk Time (%)		49						
Queuing Penalty (veh)		0						
Storage Bay Dist (m)	55.0		25.0					15.0
Storage Blk Time (%)	1	42	0	16			30	11
Queuing Penalty (veh)	8	98	0	0			63	17

Intersection: 2: Pearl Street & Lakeshore Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	33.4	99.0	8.0	38.3	40.4	24.4	16.4	29.9
Average Queue (m)	4.8	35.5	0.5	14.0	17.1	11.0	3.7	9.8
95th Queue (m)	17.3	77.3	3.7	29.4	34.0	22.7	12.1	20.9
Link Distance (m)		237.5		103.4	103.4	240.6		41.2
Upstream Blk Time (%)								0
Queuing Penalty (veh)								0
Storage Bay Dist (m)	40.0		20.0				7.0	
Storage Blk Time (%)		4		2			12	10
Queuing Penalty (veh)		2		0			7	1

Intersection: 3: Lakeshore Road & Martha Street

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (m)	18.9	21.0	6.5	45.6
Average Queue (m)	9.2	0.7	0.3	17.0
95th Queue (m)	17.6	9.1	3.2	35.6
Link Distance (m)		103.4	135.3	42.1
Upstream Blk Time (%)				3
Queuing Penalty (veh)				0
Storage Bay Dist (m)	15.0			
Storage Blk Time (%)	2			
Queuing Penalty (veh)	19			

Intersection: 4: Old Lakeshore Road

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (m)	1.3	10.8	10.1
Average Queue (m)	0.1	3.7	3.2
95th Queue (m)	1.2	11.1	8.6
Link Distance (m)	135.3		118.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		15.0	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		1	

Intersection: 5: Old Lakeshore Road & Driveway A

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	0.9	13.7
Average Queue (m)	0.0	6.0
95th Queue (m)	0.9	12.7
Link Distance (m)	240.6	48.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 216

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	3178	3162	3176	3000	3051	3006	3089
Vehs Exited	3156	3134	3189	3017	3043	3003	3084
Starting Vehs	98	103	120	106	100	88	96
Ending Vehs	120	131	107	89	108	91	101
Travel Distance (km)	2097	2065	2081	1978	1987	1938	1986
Travel Time (hr)	239.6	230.7	275.6	325.9	226.2	258.6	269.5
Total Delay (hr)	195.0	186.9	231.3	283.7	184.0	217.1	227.2
Total Stops	3014	3242	3230	2959	2965	3002	3066
Fuel Used (l)	345.8	337.2	378.4	413.2	326.8	352.3	363.4

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3108	3162	3140	3107
Vehs Exited	3106	3152	3129	3101
Starting Vehs	95	93	96	97
Ending Vehs	97	103	107	102
Travel Distance (km)	2012	2084	2048	2028
Travel Time (hr)	253.1	241.3	304.3	262.5
Total Delay (hr)	210.3	197.0	260.7	219.3
Total Stops	3039	3069	3150	3075
Fuel Used (l)	351.6	347.7	398.9	361.5

Interval #0 Information Seeding

Start Time	6:57
End Time	7:12
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	3178	3162	3176	3000	3051	3006	3089
Vehs Exited	3156	3134	3189	3017	3043	3003	3084
Starting Vehs	98	103	120	106	100	88	96
Ending Vehs	120	131	107	89	108	91	101
Travel Distance (km)	2097	2065	2081	1978	1987	1938	1986
Travel Time (hr)	239.6	230.7	275.6	325.9	226.2	258.6	269.5
Total Delay (hr)	195.0	186.9	231.3	283.7	184.0	217.1	227.2
Total Stops	3014	3242	3230	2959	2965	3002	3066
Fuel Used (l)	345.8	337.2	378.4	413.2	326.8	352.3	363.4

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	3108	3162	3140	3107
Vehs Exited	3106	3152	3129	3101
Starting Vehs	95	93	96	97
Ending Vehs	97	103	107	102
Travel Distance (km)	2012	2084	2048	2028
Travel Time (hr)	253.1	241.3	304.3	262.5
Total Delay (hr)	210.3	197.0	260.7	219.3
Total Stops	3039	3069	3150	3075
Fuel Used (l)	351.6	347.7	398.9	361.5

Intersection: 1: Private Driveway/Brant Street & Lakeshore Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	62.4	163.1	15.3	145.4	151.4	13.3	124.7	22.8
Average Queue (m)	54.7	154.1	1.2	92.7	99.8	2.7	114.0	22.1
95th Queue (m)	78.1	159.6	7.8	137.5	144.3	9.8	124.9	25.3
Link Distance (m)		147.9		237.5	237.5	60.8	107.9	
Upstream Blk Time (%)		53					73	
Queuing Penalty (veh)		0					0	
Storage Bay Dist (m)	55.0		25.0					15.0
Storage Blk Time (%)	25	36		35			53	43
Queuing Penalty (veh)	213	82		1			207	90

Intersection: 2: Pearl Street & Lakeshore Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	37.3	93.4	8.6	44.5	49.0	32.1	16.8	40.4
Average Queue (m)	5.5	36.4	1.5	20.9	24.2	14.0	7.8	14.6
95th Queue (m)	18.1	77.4	6.6	38.9	42.9	27.2	16.8	31.3
Link Distance (m)		237.5		103.4	103.4	240.6		41.2
Upstream Blk Time (%)								1
Queuing Penalty (veh)								0
Storage Bay Dist (m)	40.0		20.0				7.0	
Storage Blk Time (%)		5		5			32	19
Queuing Penalty (veh)		2		0			21	7

Intersection: 3: Lakeshore Road & Martha Street

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (m)	20.6	57.6	22.8	41.0
Average Queue (m)	11.0	6.6	1.5	15.1
95th Queue (m)	19.9	37.1	9.7	34.6
Link Distance (m)		103.4	135.3	42.1
Upstream Blk Time (%)		0		2
Queuing Penalty (veh)		1		0
Storage Bay Dist (m)	15.0			
Storage Blk Time (%)	7	0		
Queuing Penalty (veh)	59	0		

Intersection: 4: Old Lakeshore Road & Lakeshore Road

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (m)	0.6	14.3	22.2
Average Queue (m)	0.0	3.8	5.4
95th Queue (m)	0.6	11.5	14.4
Link Distance (m)	135.3		118.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		15.0	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		4	

Intersection: 5: Old Lakeshore Road & Driveway A

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	1.8	9.3
Average Queue (m)	0.1	5.1
95th Queue (m)	1.6	11.2
Link Distance (m)	240.6	48.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 687

Appendix G

Synchro Operations Reports (Sensitivity)

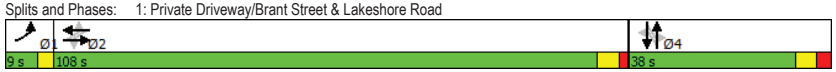
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	1084	9	2	779	178	6	3	4	146	3	204
Future Volume (vph)	233	1084	9	2	779	178	6	3	4	146	3	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	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			0.972			0.961			0.852	
Flt Protected	0.950			0.950				0.976		0.950		
Satd. Flow (prot)	1547	1642	0	1083	2978	0	0	1483	0	1608	1383	0
Flt Permitted	0.235			0.059				0.804		0.748		
Satd. Flow (perm)	381	1642	0	67	2978	0	0	1221	0	1248	1383	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			38			4			222	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			261.3			72.5			121.7	
Travel Time (s)		11.4			18.8			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%	50%	5%	5%	0%	33%	0%	1%	0%	4%
Adj. Flow (vph)	253	1178	10	2	847	193	7	3	4	159	3	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	253	1188	0	2	1040	0	0	14	0	159	225	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	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	108.0		108.0	108.0		38.0	38.0		38.0	38.0	
Total Split (%)	5.8%	69.7%		69.7%	69.7%		24.5%	24.5%		24.5%	24.5%	
Maximum Green (s)	6.0	102.0		102.0	102.0		31.0	31.0		31.0	31.0	
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							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		None	None		None	None	
Walk Time (s)		11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		16.0		16.0	16.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	111.2	104.1		104.1	104.1			26.2		26.2	26.2	
Actuated g/C Ratio	0.75	0.71		0.71	0.71			0.18		0.18	0.18	
v/c Ratio	0.76	1.02		0.04	0.49			0.06		0.72	0.53	
Control Delay	23.8	55.4		11.0	10.8			39.5		75.3	10.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	23.8	55.4		11.0	10.8			39.5		75.3	10.9	
LOS	C	E		B	B			D		E	B	
Approach Delay		49.9			10.8			39.5			37.6	
Approach LOS		D			B			D			D	
Queue Length 50th (m)	18.8	~390.8		0.2	67.7			2.6		46.6	0.8	
Queue Length 95th (m)	#42.7	#514.6		1.5	97.2			9.5		73.2	25.2	
Internal Link Dist (m)		134.0			237.3			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	334	1160		47	2115			284		288	490	
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	0.76	1.02		0.04	0.49			0.05		0.55	0.46	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 155			
Actuated Cycle Length: 147.4			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 34.1		Intersection LOS: C	
Intersection Capacity Utilization 96.7%		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)	233	1084	9	2	779	178	6	3	4	146	3	204
Future Volume (vph)	233	1084	9	2	779	178	6	3	4	146	3	204
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			0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		0.99	1.00	
Frt	1.00	1.00		1.00	0.97			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)	1545	1642		1083	2979			1483		1586	1383	
Flt Permitted	0.24	1.00		0.06	1.00			0.80		0.75	1.00	
Satd. Flow (perm)	383	1642		67	2979			1223		1249	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)	253	1178	10	2	847	193	7	3	4	159	3	222
RTOR Reduction (vph)	0	0	0	0	11	0	0	3	0	0	183	0
Lane Group Flow (vph)	253	1188	0	2	1029	0	0	11	0	159	42	0
Confl. Peds. (#/hr)	12		10	10		12	1		6	6		1
Heavy Vehicles (%)	5%	4%	0%	50%	5%	5%	0%	33%	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)	108.2	102.2		102.2	102.2			23.2		23.2	23.2	
Effective Green, g (s)	108.2	104.2		104.2	104.2			26.2		26.2	26.2	
Actuated g/C Ratio	0.73	0.71		0.71	0.71			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)	328	1160		47	2105			217		222	245	
v/s Ratio Prot	c0.03	c0.72			0.35						0.03	
v/s Ratio Perm	0.53			0.03				0.01		c0.13		
v/c Ratio	0.77	1.02		0.04	0.49			0.05		0.72	0.17	
Uniform Delay, d1	10.2	21.6		6.5	9.7			50.3		57.1	51.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	10.7	32.6		1.7	0.8			0.1		10.5	0.3	
Delay (s)	20.9	54.2		8.2	10.5			50.4		67.6	51.8	
Level of Service	C	D		A	B			D		E	D	
Approach Delay (s)		48.4			10.5			50.4			58.3	
Approach LOS		D			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	147.4	Sum of lost time (s)	11.0
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

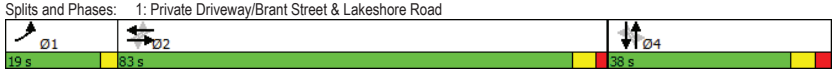
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	848	15	3	1224	166	6	8	0	211	10	379
Future Volume (vph)	226	848	15	3	1224	166	6	8	0	211	10	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (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		0.98	0.95	
Frt		0.997			0.982						0.854	
Flt Protected	0.950			0.950				0.979		0.950		
Satd. Flow (prot)	1624	1652	0	1624	3067	0	0	1674	0	1518	1358	0
Flt Permitted	0.078			0.080				0.552		0.747		
Satd. Flow (perm)	133	1652	0	137	3067	0	0	939	0	1175	1358	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			17						221	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			261.3			72.5			121.7	
Travel Time (s)		11.4			18.8			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 (%)	0%	3%	0%	0%	3%	2%	0%	0%	0%	7%	0%	2%
Adj. Flow (vph)	246	922	16	3	1330	180	7	9	0	229	11	412
Shared Lane Traffic (%)												
Lane Group Flow (vph)	246	938	0	3	1510	0	0	16	0	229	423	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	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)	19.0	83.0		83.0	83.0		38.0	38.0		38.0	38.0	
Total Split (%)	13.6%	59.3%		59.3%	59.3%		27.1%	27.1%		27.1%	27.1%	
Maximum Green (s)	16.0	77.0		77.0	77.0		31.0	31.0		31.0	31.0	
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							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		None	None		None	None	
Walk Time (s)		11.0		11.0	11.0		12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		16.0		16.0	16.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	96.0	79.1		79.1	79.1			31.3		31.3	31.3	
Actuated g/C Ratio	0.70	0.58		0.58	0.58			0.23		0.23	0.23	
v/c Ratio	0.93	0.99		0.04	0.85			0.07		0.85	0.88	
Control Delay	72.7	55.5		15.3	30.5			42.2		79.0	44.4	
Queue Delay	0.0	0.0		0.0	1.4			0.0		0.0	0.0	
Total Delay	72.7	55.5		15.3	31.8			42.2		79.0	44.4	
LOS	E	E		B	C			D		E	D	
Approach Delay		59.1			31.8			42.2			56.6	
Approach LOS		E			C			D			E	
Queue Length 50th (m)	48.2	~269.1		0.4	189.1			3.6		63.2	61.0	
Queue Length 95th (m)	#102.9	#368.6		2.1	227.5			10.3		#107.2	#122.1	
Internal Link Dist (m)		134.0			237.3			48.5			97.7	
Turn Bay Length (m)	55.0			25.0								
Base Capacity (vph)	266	951		78	1773			232		291	502	
Starvation Cap Reductn	0	0		0	115			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	0.92	0.99		0.04	0.91			0.07		0.79	0.84	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 140			
Actuated Cycle Length: 137.3			
Natural Cycle: 130			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 46.2		Intersection LOS: D	
Intersection Capacity Utilization 97.0%		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)	226	848	15	3	1224	166	6	8	0	211	10	379
Future Volume (vph)	226	848	15	3	1224	166	6	8	0	211	10	379
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			0.99		0.98	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)	1624	1653		1624	3068			1664		1495	1359	
Flt Permitted	0.08	1.00		0.08	1.00			0.55		0.75	1.00	
Satd. Flow (perm)	134	1653		136	3068			939		1176	1359	
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)	246	922	16	3	1330	180	7	9	0	229	11	412
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	171	0
Lane Group Flow (vph)	246	938	0	3	1503	0	0	16	0	229	252	0
Confl. Peds. (#/hr)	28		49	49		28	31		7	7		31
Heavy Vehicles (%)	0%	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)	93.0	77.1		77.1	77.1			28.3		28.3	28.3	
Effective Green, g (s)	93.0	79.1		79.1	79.1			31.3		31.3	31.3	
Actuated g/C Ratio	0.68	0.58		0.58	0.58			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)	263	952		78	1767			214		268	309	
v/s Ratio Prot	c0.11	c0.57			0.49						0.19	
v/s Ratio Perm	0.53			0.02				0.02		c0.19		
v/c Ratio	0.94	0.98		0.04	0.85			0.07		0.85	0.82	
Uniform Delay, d1	38.9	28.5		12.6	24.2			41.6		50.8	50.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	38.1	25.7		0.9	5.4			0.1		22.3	15.3	
Delay (s)	77.0	54.3		13.5	29.6			41.8		73.2	65.5	
Level of Service	E	D		B	C			D		E	E	
Approach Delay (s)		59.0			29.5			41.8			68.2	
Approach LOS		E			C			D			E	

Intersection Summary					
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.95				
Actuated Cycle Length (s)	137.3	Sum of lost time (s)	11.0		
Intersection Capacity Utilization	97.0%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group

Appendix H

Zoning By-law 2020

(c) A decorative finish shall be applied to all exterior walls facing a street or residential zone.

(d) Overhead doors are not permitted in a building elevation facing Brant Street and Lakeshore Road.

4.6 LANDSCAPE AREA AND BUFFER

Landscape Area:

Abutting a creek block or 03 zone	3 m
For a parking lot as a principal use:	3 m abutting a street
Abutting a PC or P zone:	3 m

Landscape Buffer:

Abutting a Residential or DRL Zone:	3 m

4.7 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:

Apartment Dwelling Units: 1.25 spaces per unit

(b) Parking is not permitted in a front yard between the street line and the building elevation facing the street.

(c) Surface parking is not permitted in a DC, DW, DL-A or DL-B zone; temporary parking for drop off or delivery excepted.

(d) Parking of trucks and trailers is prohibited except when:
- the truck or trailer is being loaded and unloaded
- the truck or trailer is for customer use
- the truck or trailer belongs to a property owner or tenant
- the truck or trailer is being used for charitable purposes

4.8 OUTSIDE STORAGE

(a) Only merchandise displayed for retail sale may be stored outside, provided the merchandise is not stored in a truck, trailer or other vehicle.

(b) Perishable waste must be kept in refrigerated storage within a building. Alternatively, perishable waste may be stored outside if a deep collection waste disposal system, comprised of a sealed container with a lockable lid located primarily below grade, is used.

Appendix I

Proxy Surveys

551 Maple Avenue - Residential Parking Utilization Survey (186 Units)

Time Ending	Thursday November 1, 2016			Wednesday November 2, 2016			Tuesday November 8, 2016			Wednesday November 9, 2016			Four Day Average		
	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate
4:15	60	181	0.32	43	198	0.23	52	189	0.28	58	183	0.31	57	184	0.30
4:30	56	185	0.30	39	202	0.21	53	188	0.28	60	181	0.32	56	185	0.30
4:45	57	184	0.31	47	194	0.25	60	181	0.32	60	181	0.32	59	182	0.32
5:00	60	181	0.32	52	189	0.28	61	180	0.33	63	178	0.34	61	180	0.33
5:15	68	173	0.37	56	185	0.30	60	181	0.32	65	176	0.35	64	177	0.35
5:30	80	161	0.43	60	181	0.32	76	165	0.41	68	173	0.37	75	166	0.40
5:45	82	159	0.44	78	163	0.42	84	157	0.45	69	172	0.37	78	163	0.42
6:00	84	157	0.45	89	152	0.48	84	157	0.45	72	169	0.39	80	161	0.43
6:15	93	148	0.50	90	151	0.48	88	153	0.47	88	153	0.47	90	151	0.48
6:30	96	145	0.52	101	140	0.54	93	148	0.50	95	146	0.51	95	146	0.51
6:45	93	148	0.50	102	139	0.55	96	145	0.52	103	138	0.55	97	144	0.52
7:00	103	138	0.55	110	131	0.59	98	143	0.53	108	133	0.58	103	138	0.55
7:15	112	129	0.60	118	123	0.63	104	137	0.56	111	130	0.60	109	132	0.59
7:30	110	131	0.59	130	111	0.70	110	131	0.59	115	126	0.62	112	129	0.60
7:45	120	121	0.65	129	112	0.69	118	123	0.63	122	119	0.66	120	121	0.65
8:00	132	109	0.71	133	108	0.72	125	116	0.67	128	113	0.69	128	113	0.69
8:15	134	107	0.72	131	110	0.70	132	109	0.71	130	111	0.70	132	109	0.71
8:30	133	108	0.72	146	95	0.78	138	103	0.74	138	103	0.74	136	105	0.73
8:45	134	107	0.72	149	92	0.80	142	99	0.76	135	106	0.73	137	104	0.74
9:00	140	101	0.75	155	86	0.83	147	94	0.79	132	109	0.71	140	101	0.75
9:15	141	100	0.76	154	87	0.83	145	96	0.78	132	109	0.71	139	102	0.75
9:30	143	98	0.77	154	87	0.83	150	91	0.81	145	96	0.78	146	95	0.78
9:45	146	95	0.78	153	88	0.82	151	90	0.81	148	93	0.80	148	93	0.80
10:00	146	95	0.78	153	88	0.82	154	87	0.83	148	93	0.80	149	92	0.80
Maximum Observed	**146**	**185**	**0.78**	**155**	**202**	**0.83**	**154**	**189**	**0.83**	**148**	**183**	**0.80**	**149**	**185**	**0.80**
Minimum Observed	**56**	**95**	**0.30**	**39**	**86**	**0.21**	**52**	**87**	**0.28**	**58**	**93**	**0.31**	**56**	**92**	**0.30**
Average Observed	**105**	**136**	**0.57**	**107**	**134**	**0.58**	**105**	**136**	**0.56**	**104**	**137**	**0.56**	**105**	**136**	**0.56**

551 Maple Avenue - Visitor Parking Utilization Survey (186 Units)

Time Ending	Thursday November 1, 2016			Wednesday November 2, 2016			Tuesday November 8, 2016			Wednesday November 9, 2016			Four Day Average		
	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate
4:15	12	35	0.06	9	38	0.05	15	32	0.08	12	35	0.06	13	34	0.07
4:30	8	39	0.04	7	40	0.04	15	32	0.08	9	38	0.05	11	36	0.06
4:45	12	35	0.06	11	36	0.06	15	32	0.08	13	34	0.07	13	34	0.07
5:00	13	34	0.07	13	34	0.07	12	35	0.06	13	34	0.07	13	34	0.07
5:15	13	34	0.07	13	34	0.07	15	32	0.08	13	34	0.07	14	33	0.07
5:30	15	32	0.08	13	34	0.07	11	36	0.06	12	35	0.06	13	34	0.07
5:45	12	35	0.06	15	32	0.08	12	35	0.06	12	35	0.06	12	35	0.06
6:00	19	28	0.10	13	34	0.07	11	36	0.06	13	34	0.07	14	33	0.08
6:15	17	30	0.09	15	32	0.08	15	32	0.08	16	31	0.09	16	31	0.09
6:30	15	32	0.08	15	32	0.08	12	35	0.06	15	32	0.08	14	33	0.08
6:45	13	34	0.07	16	31	0.09	13	34	0.07	15	32	0.08	14	33	0.07
7:00	15	32	0.08	20	27	0.11	15	32	0.08	16	31	0.09	15	32	0.08
7:15	15	32	0.08	21	26	0.11	19	28	0.10	19	28	0.10	18	29	0.09
7:30	15	32	0.08	22	25	0.12	22	25	0.12	19	28	0.10	19	28	0.10
7:45	15	32	0.08	24	23	0.13	17	30	0.09	19	28	0.10	17	30	0.09
8:00	15	32	0.08	25	22	0.13	15	32	0.08	19	28	0.10	16	31	0.09
8:15	16	31	0.09	23	24	0.12	17	30	0.09	19	28	0.10	17	30	0.09
8:30	16	31	0.09	20	27	0.11	15	32	0.08	17	30	0.09	16	31	0.09
8:45	15	32	0.08	23	24	0.12	13	34	0.07	16	31	0.09	15	32	0.08
9:00	15	32	0.08	23	24	0.12	13	34	0.07	17	30	0.09	15	32	0.08
9:15	16	31	0.09	20	27	0.11	15	32	0.08	17	30	0.09	16	31	0.09
9:30	16	31	0.09	16	31	0.09	13	34	0.07	15	32	0.08	15	32	0.08
9:45	16	31	0.09	16	31	0.09	16	31	0.09	16	31	0.09	16	31	0.09
10:00	15	32	0.08	16	31	0.09	16	31	0.09	16	31	0.09	16	31	0.08
Maximum Observed	**19**	**39**	**0.10**	**25**	**40**	**0.13**	**22**	**36**	**0.12**	**19**	**38**	**0.10**	**19**	**36**	**0.10**
Minimum Observed	**8**	**28**	**0.04**	**7**	**22**	**0.04**	**11**	**25**	**0.06**	**9**	**28**	**0.05**	**11**	**28**	**0.06**
Average Observed	**15**	**32**	**0.08**	**17**	**30**	**0.09**	**15**	**32**	**0.08**	**15**	**32**	**0.08**	**15**	**32**	**0.08**

360 Pearl Street - Residential Parking Utilization Survey (75 Units)

Time Ending	Thursday November 1, 2016			Wednesday November 2, 2016			Tuesday November 8, 2016			Wednesday November 9, 2016			Four Day Average		
	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate
4:15	13	101	0.17	21	93	0.28	18	96	0.24	18	96	0.24	16	225	0.22
4:30	12	102	0.16	20	94	0.27	17	97	0.23	18	96	0.24	16	225	0.21
4:45	15	99	0.20	20	94	0.27	19	95	0.25	21	93	0.28	18	223	0.24
5:00	17	97	0.23	21	93	0.28	20	94	0.27	22	92	0.29	20	221	0.26
5:15	19	95	0.25	24	90	0.32	22	92	0.29	21	93	0.28	21	220	0.28
5:30	20	94	0.27	29	85	0.39	26	88	0.35	28	86	0.37	25	216	0.33
5:45	28	86	0.37	30	84	0.40	30	84	0.40	31	83	0.41	30	211	0.40
6:00	32	82	0.43	31	83	0.41	31	83	0.41	31	83	0.41	31	210	0.42
6:15	33	81	0.44	35	79	0.47	33	81	0.44	32	82	0.43	33	208	0.44
6:30	37	77	0.49	36	78	0.48	36	78	0.48	35	79	0.47	36	205	0.48
6:45	38	76	0.51	36	78	0.48	37	77	0.49	36	78	0.48	37	204	0.49
7:00	41	73	0.55	40	74	0.53	39	75	0.52	37	77	0.49	39	202	0.52
7:15	44	70	0.59	42	72	0.56	42	72	0.56	39	75	0.52	42	199	0.56
7:30	49	65	0.65	41	73	0.55	44	70	0.59	41	73	0.55	45	196	0.60
7:45	48	66	0.64	45	69	0.60	46	68	0.61	45	69	0.60	46	195	0.62
8:00	50	64	0.67	50	64	0.67	50	64	0.67	47	67	0.63	49	192	0.65
8:15	53	61	0.71	51	63	0.68	52	62	0.69	50	64	0.67	52	189	0.69
8:30	55	59	0.73	51	63	0.68	53	61	0.71	53	61	0.71	54	187	0.72
8:45	56	58	0.75	51	63	0.68	54	60	0.72	54	60	0.72	55	186	0.73
9:00	56	58	0.75	53	61	0.71	56	58	0.75	56	58	0.75	56	185	0.75
9:15	58	56	0.77	54	60	0.72	56	58	0.75	55	59	0.73	56	185	0.75
9:30	58	56	0.77	55	59	0.73	57	57	0.76	55	59	0.73	57	184	0.76
9:45	58	56	0.77	56	58	0.75	57	57	0.76	55	59	0.73	57	184	0.76
10:00	58	56	0.77	58	56	0.77	57	57	0.76	55	59	0.73	57	184	0.76
Maximum Observed	**58**	**102**	**0.77**	**58**	**94**	**0.77**	**57**	**97**	**0.76**	**56**	**96**	**0.75**	**57**	**225**	**0.76**
Minimum Observed	**12**	**56**	**0.16**	**20**	**56**	**0.27**	**17**	**57**	**0.23**	**18**	**58**	**0.24**	**16**	**184**	**0.21**
Average Observed	**40**	**75**	**0.53**	**40**	**74**	**0.53**	**40**	**74**	**0.53**	**39**	**75**	**0.52**	**39**	**202**	**0.53**

360 Pearl Street - Visitor Parking Utilization Survey (75 Units)

Time Ending	Thursday November 1, 2016			Wednesday November 2, 2016			Tuesday November 8, 2016			Wednesday November 9, 2016			Four Day Average		
	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate
4:15	7	5	0.09	7	5	0.09	9	3	0.12	5	7	0.07	7	40	0.09
4:30	6	6	0.08	7	5	0.09	10	2	0.13	5	7	0.07	7	40	0.09
4:45	6	6	0.08	7	5	0.09	8	4	0.11	4	8	0.05	6	41	0.08
5:00	7	5	0.09	6	6	0.08	8	4	0.11	6	6	0.08	7	40	0.09
5:15	7	5	0.09	7	5	0.09	8	4	0.11	6	6	0.08	7	40	0.09
5:30	8	4	0.11	6	6	0.08	8	4	0.11	6	6	0.08	7	40	0.10
5:45	6	6	0.08	8	4	0.11	8	4	0.11	6	6	0.08	7	40	0.09
6:00	5	7	0.07	7	5	0.09	8	4	0.11	6	6	0.08	6	41	0.08
6:15	6	6	0.08	6	6	0.08	8	4	0.11	6	6	0.08	7	40	0.09
6:30	7	5	0.09	7	5	0.09	7	5	0.09	5	7	0.07	6	41	0.08
6:45	7	5	0.09	7	5	0.09	7	5	0.09	6	6	0.08	7	40	0.09
7:00	7	5	0.09	7	5	0.09	8	4	0.11	6	6	0.08	7	40	0.09
7:15	5	7	0.07	8	4	0.11	8	4	0.11	6	6	0.08	6	41	0.08
7:30	5	7	0.07	8	4	0.11	7	5	0.09	5	7	0.07	6	41	0.08
7:45	5	7	0.07	7	5	0.09	6	6	0.08	5	7	0.07	5	42	0.07
8:00	6	6	0.08	8	4	0.11	6	6	0.08	4	8	0.05	5	42	0.07
8:15	6	6	0.08	7	5	0.09	5	7	0.07	4	8	0.05	5	42	0.07
8:30	6	6	0.08	7	5	0.09	5	7	0.07	4	8	0.05	5	42	0.07
8:45	5	7	0.07	6	6	0.08	4	8	0.05	3	9	0.04	4	43	0.05
9:00	5	7	0.07	5	7	0.07	4	8	0.05	3	9	0.04	4	43	0.05
9:15	5	7	0.07	5	7	0.07	3	9	0.04	2	10	0.03	3	44	0.04
9:30	4	8	0.05	5	7	0.07	3	9	0.04	3	9	0.04	3	44	0.04
9:45	4	8	0.05	5	7	0.07	3	9	0.04	4	8	0.05	4	43	0.05
10:00	4	8	0.05	2	10	0.03	3	9	0.04	4	8	0.05	4	43	0.05
Maximum Observed	**8**	**8**	**0.11**	**8**	**10**	**0.11**	**10**	**9**	**0.13**	**6**	**10**	**0.08**	**7**	**44**	**0.10**
Minimum Observed	**4**	**4**	**0.05**	**2**	**4**	**0.03**	**3**	**2**	**0.04**	**2**	**6**	**0.03**	**3**	**40**	**0.04**
Average Observed	**6**	**6**	**0.08**	**6**	**6**	**0.09**	**6**	**6**	**0.09**	**5**	**7**	**0.06**	**6**	**41**	**0.08**