TRAFFIC IMPACT STUDY

441 MAPLE AVENUE

ZONING BY-LAW AMENDMENT
OFFICIAL PLAN AMENDMENT

CITY OF BURLINGTON

PREPARED FOR:

BETTER LIFE RETIREMENT RESIDENCE INC.
(C/O 2564905 ONTARIO INC.)

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CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev.1	December 2018	Issued for First Submission
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1.0 Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Better Life Retirement Residence Inc. (c/o 2564905 Ontario Inc.) to support a residential development located at 441 Maple Avenue, in the City of Burlington from a transportation perspective for Zoning By-Law and Local Official Plan Amendments.

The proposal is for an 11 storey residential building fronting onto Maple Avenue and consisting of one and two bedroom units for a total of 140 units. A total of 162 parking spaces are proposed within three levels of underground parking with an additional 15 parking spaces to be utilized for visitor parking on the adjacent hydro lands through an existing License Agreement. One (1) full movement site access is proposed at Maple Avenue.

Under existing conditions, the intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue operates at a Level of Service "C" during the weekday a.m. and p.m. peak periods, with average delays per vehicle of 36.3 and 33.1 seconds, respectively. A maximum volume-to-capacity ratio of 0.95 is observed for the southbound right-turn movement during the weekday p.m. peak period. Queues for the eastbound and westbound left-turn movements may occasionally extend into the tapers and beyond the effective storage area. The intersection of Maple Avenue at Bellview Street operates at a Level of Service "B" and "C" during the weekday a.m. and p.m. peak periods, with average delays per vehicle of 14.4 and 22.8 seconds, respectively.

Under 2025 future background conditions, the intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue operates at a Level of Service "D" during the weekday a.m. and p.m. peak periods, with average delays per vehicle of 41.2 and 47.6 seconds, respectively. A maximum volume-to-capacity ratio of 0.99 is observed for the southbound right-turn movement during the weekday p.m. peak period. Queues for the eastbound and westbound left-turn movements may occasionally extend into the tapers and adjacent through lanes during peak periods. The intersection of Maple Avenue at Bellview Street operates at a Level of Service "C" and "D" during the weekday a.m. and p.m. peak periods, with average delays per vehicle of 15.6 and 26.8 seconds, respectively.

The proposed development will result in an additional 26 two-way trips in the weekday a.m. peak hour and 23 two-way trips in the weekday p.m. peak hour vehicles on the boundary road network that previously did not exist.

The addition of site-generated traffic to the roadway system will have a minimal effect on the operations of North Shore Boulevard/Lakeshore Road at Maple Avenue intersection during the a.m. and p.m. peak periods. The Levels of Service will remain unchanged during the peak periods. The average delay is expected to increase by 0.6 seconds during the morning peak period and increase by 0.2 seconds during the evening peak period.

Given the high delays and the near-capacity operation of the intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue under future background and future total conditions, it is recommended that the City monitor the signal timings and optimize the signal timings to reduce delays.

162 parking spaces are provided on site and an additional 15 parking spaces are available under a license agreement with Hydro One at the parking lot adjacent to the site and is fully accessible from the site. With the combination of the parking spaces provided on site and the parking spaces under license, a total of 177 parking spaces are available, thus providing a total parking rate of 1 parking space per unit for residents, 0.26 spaces per unit for visitors.

The Zoning By-Law and Official Plan Amendments can be supported from a transportation perspective. The boundary road system can accommodate the minimal increase in traffic volumes attributable to the proposed redevelopment.

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY II

2.0 INTRODUCTION 1

3.0 EXISTING CONDITIONS 1

3.1 Development Lands 1
3.2 Boundary Road Network 1
3.3 Public Transit 2
3.4 Traffic Data 2
3.5 Traffic Modelling 2
3.6 Intersection Operations 3

4.0 FUTURE BACKGROUND CONDITIONS 4

4.1 Study Horizons 4
4.2 Background Developments 4
4.3 Traffic Growth Rates 4
4.4 Intersection Operations 4

5.0 DEVELOPMENT PROPOSAL 6

5.1 Site Generated Traffic 6
5.2 Trip Distribution and Assignment 7

6.0 FUTURE TOTAL CONDITIONS 8

6.1 Intersection Operations 8

7.0 PARKING REQUIREMENTS 9

7.1 Parking Requirements – City of Burlington Zoning By-Law 2020 9

8.0 TRANSPORTATION DEMAND MANAGEMENT (TDM) 11

8.1 TDM Strategies Identification 11
8.1.1 Walking / Cycling 11

8.2 TDM Strategies Implementation 11
8.2.1 Transit Incentive 11
8.2.2 Marketing 12

9.0 CONCLUSION 12

LIST OF APPENDICES

Appendix A: Correspondence
Appendix B: Traffic Data and Signal Timing Plans
Appendix C: Levels of Service Definitions
Appendix D: Detailed Capacity Analyses
Appendix E: Parson's Traffic Impact Study Excerpts
Appendix F: TTS Data
Appendix G: Relevant Maps and Zoning By-Law Excerpts

LIST OF FIGURES

Figure 1: Site Plan
Figure 2: Existing Traffic Volumes
Figure 3: 2025 Future Background Traffic Volumes
Figure 4: Site Trip Distribution
Figure 5: Site Trip Assignment
Figure 6: 2025 Future Total Traffic Volumes

2.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by MHBC Planning on behalf of Better Life Retirement Residence Inc. (c/o 2564905 Ontario Inc.) in August 2018 to undertake a Traffic Impact Study (TIS) in support of Zoning By-Law and Local Official Plan Amendments. The purpose of the study is to assess the impacts of the proposed development on the boundary road network and to recommend required mitigation measures if warranted.

The study has been completed in accordance with the procedures set out in Halton Region's Transportation Impact Study Guidelines with the associated analysis and findings outlined herein. A scope of work outlining the work plan for the study was sent to the City of Burlington Staff on August 7, 2018, and is provided in Appendix A.

A Traffic Impact Study was submitted in December 2018 to the City of Burlington as part Official Plan Amendment and Rezoning Application for the subject lands. Comments on the submitted report were received in May 2019. This updated TIS report addresses all comments received to date from the City.

3.0 Existing Conditions

3.1 Development Lands

The subject lands cover approximately 0.28 ha and currently consists of 'Maple Villa'- Long Term Care Centre with 93 beds in 35 rooms. There are currently two accesses, one ingress and one egress, onto Maple Avenue. The property, located in downtown Burlington, is bounded by Maple Avenue to the west, rental apartment buildings to the north and south, and a municipal parking lot with 74 spots to the east. Refer to the Site Plan, prepared by Michael Spaziani Architect Inc., illustrated in Figure1, updated in October 2020, containing the keymap for the site location.

3.2 Boundary Road Network

With skewed directions, the directional orientation of the roadway system is ambiguous. To provide clarity throughout this report and in the supporting analysis, Maple Avenue has been assigned a north-south orientation. Bellview Street and North Shore Boulevard/Lakeshore Road have been assigned an east-west orientation.

Maple Avenue is a north-south roadway with a four-lane urban cross-section. Maple Avenue is under the jurisdiction of the City of Burlington and is defined as a major road. The roadway has sidewalks available on both sides and has a posted speed limit of 50 km/h throughout the study area. Maple Avenue is known as Lakeshore Road south of North Short Boulevard.

Bellview Street is an east-west roadway with a two-lane urban cross-section. Bellview Street is under the jurisdiction of the City of Burlington and is defined as a minor road. The roadway has sidewalks available on both sides and has a posted speed limit of 40 km/h throughout the study area.

North Shore Boulevard/Lakeshore Road is an east-west roadway with a four-lane urban cross-section. The roadway is under the jurisdiction of the City of Burlington and is defined as a major road with a posted speed limit of 60 km/h. The roadway is known as North Shore Boulevard East to the east of Maple Avenue and Lakeshore Road to the west of Maple Avenue.

The four-legged intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue is signalized. All the approaches consist of a left-turn lane, a through lane and a shared through/right-

turn lane, except the north approach, which has an exclusive right turn lane. Pedestrian facilities are present on all legs of the intersection.

3.3 Public Transit

There are multiple transit stops located in the vicinity of the site. Two (2) bus stops are located at Maple Avenue and Elgin Street, located approximately 120 m north of the site. Two (2) bus stops are located approximately 100 meters south of the site at Lakeshore Road and Maple Avenue.

The study area is serviced by three (3) buses. Burlington Transit Route 10 'New Maple', Route 50 'Burlington South', and Route 300 'Aldershot' operate on daily schedules and provide direct connections to the Appleby Mall, Lakeside Plaza, Mapleview Mall, Burlington Seniors', Burlington and Appleby GO stations, and many other employment and service nodes within Burlington.

3.4 Traffic Data

Turning movement counts at the intersections of North Shore Boulevard/Lakeshore Road at Maple Avenue dated May 2, 2018, were provided by the City of Burlington. The traffic counts provided by the City were collected between the weekday a.m. peak hours of 7:00 a.m. and 9:00 a.m. and weekday p.m. peak hours of 3:00 p.m. and 6:00 p.m. Additionally, turning movement counts at the intersections of North Shore Boulevard/Lakeshore Road at Maple Avenue and Maple Avenue at Bellview Street were conducted by Spectrum Traffic Inc. on behalf of Crozier on Tuesday, August 21, 2018, between the weekday a.m. peak hours of 6:00 a.m. and 10:00 a.m. and weekday p.m. peak hours of 3:00 p.m. and 7:00 p.m.

Using the May and August counts at the intersection of North Shore Boulevard/Lakeshore Road and Maple Avenue, a seasonal factor of 1.59 and 1.09 was calculated for the weekday a.m. and p.m. peak hours, respectively. The seasonal factors were applied to the intersection of Maple Avenue at Bellview Street to reflect typical traffic trends. Given that the surveyed traffic volumes are from 2018, an industry-standard growth rate of two percent was used to grow the traffic volumes to 2020.

Trips generated from 'Maple Villa'- Long Term Care Centre were estimated using the rates provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Land use Category 254 "Assisted Living" was used to estimate the trips generated by the development.

Detailed trip generation, along with the raw traffic data, is contained in Appendix B. Refer to Figure 3 for the existing traffic volumes. Peak hour factors used for analysis were calculated based on existing traffic.

3.5 Traffic Modelling

The assessment of intersections is based on the method outlined in the "Highway Capacity Manual, 2010" using Synchro 10 modelling software. Intersections are assessed using a Level of Service metric, with ranges of delay assigned a letter from "A" to "F". For stop-controlled intersections, a Level of Service "A" or "B" would typically be measured during off-peak hours when lesser traffic volumes are on the roadways. Levels of Service "C" through "F" would typically be measured in the commuter peak hours when more significant vehicle volumes cause longer travel times. The Level of Service (LOS) definitions for signalized intersections is included in Appendix C.

The peak hour factors, heavy vehicle percentage and pedestrian movements for the study intersection were obtained from the existing traffic movement counts. The queueing analysis was done using SimTraffic simulations with 30 minutes recording time, 10 minutes seeding time, and an average of three runs.

3.6 Intersection Operations

The traffic operations at the study intersection were analyzed based on the traffic volumes recorded. Detailed capacity analyses are included in Appendix D. The signal timings for the intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue were provided by the City of Burlington and can be found in Appendix B. The intersection operation was analyzed based on the traffic volumes illustrated in Figure 2. Table 1 outlines the existing traffic Levels of Service.

Table 1: Existing Levels of Service

Intersection	Control	Peak Hour	Level of Service	Average Delay per vehicle (s)	V/C Ratio(s) > 0.85 (Approach)	95th %ile Queues > Storage Length (m)
North Shore Boulevard/ Lakeshore Road at Maple Avenue	Signal	Weekday a.m.	D	36.3	0.92 (EBL) 0.95 (NBT)	34.6 > 30m (EBL) 39.7 > 30m (WBL) 83.3 > 60m (NBL)
		Weekday p.m.	C	33.1	None	38.8 > 30m (EBL) 36.2 > 30m (WBL) 60.7 > 60m (NBL)
Maple Avenue at Bellview Street	Stop	Weekday a.m.	B	14.4	None	None
		Weekday p.m.	C	22.8	None	None
Maple Avenue at Site Access – Entrance Only	Stop	Weekday a.m.	A	0.0	None	None
		Weekday p.m.	A	8.2	None	None
Maple Avenue at Site Access – Exit Only	Stop	Weekday a.m.	B	13.8	None	None
		Weekday p.m.	B	13.9	None	None

Note: The Level of Service of a Stop-Controlled intersection is based on the delay associated with the critical approach. The Level of Service of a signalized intersection is based on the average control delay per vehicle. 95th percentile queue analysis was completed using SimTraffic with 30 minutes recording time, 10 minutes seeding time, and an average of three runs.

As indicated in Table 1, the intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue operates at a Level of Service "C" during the weekday a.m. and p.m. peak periods, with average delays per vehicle of 36.3 and 33.1 seconds, respectively. A maximum volume-to-capacity ratio of 0.95 is observed for the southbound right-turn movement during the weekday p.m. peak period. As illustrated by the 95th percentile queue lengths, some of the storage lengths are shown to be exceeding the available storage length during the weekday a.m. and p.m. peak hours. Therefore, queues may occasionally extend into the tapers and adjacent through lanes during peak periods.

The intersection of Maple Avenue at Bellview Street operates at a Level of Service "B" and "C" during the weekday a.m. and p.m. peak periods, with average delays per vehicle of 14.4 and 22.8 seconds, respectively. No individual movements are operating with a volume to capacity ratio above 0.85.

Operational analyses of existing traffic volumes indicate that reserve capacity is available for future traffic volume growth on the boundary road network.

4.0 Future Background Conditions

4.1 Study Horizons

Per the discussions with City Staff, a five-year horizon was considered for the analysis. A study horizon year of 2025 was selected to assess the full operations of the development on the boundary road network.

4.2 Background Developments

There is currently one active development application in the vicinity of the proposed site. The application is for a 21 storey, 170-unit condominium with 2,015 ft² of ground-floor retail space that will operate as a Pharmacy. The development is located at 490-492 Brock Avenue and 1298 Ontario Street and will have access to Ontario Street. Parson's completed a Traffic Impact Study for this development in July 2017. Per the report, it is estimated that the development will generate 84 two-way trips in the a.m. peak hour and 90 two-way trips in the p.m. peak hour. The site generated trips figure from the Parson's report is provided in Appendix E.

4.3 Traffic Growth Rates

As agreed by the City of Burlington, a 2.0% growth rate per annum was applied to all through traffic during the weekday peak periods and the road network in the study area. Figure 3 illustrates the future background traffic volumes for the 2025 horizon year and reflects the traffic growth rate applied to the traffic volumes at the intersection in addition to the background development's traffic.

4.4 Intersection Operations

Traffic operations at the study intersections were analyzed with the growth rates and traffic from background developments. Table 2 outlines the 2025 future background Levels of Service.

Detailed capacity analysis worksheets are included in Appendix D.

Table 2: 2025 Future Background Level of Service

Intersection	Control	Peak Hour	Level of Service	Average Delay per vehicle (s)	V/C Ratio(s) > 0.85 (Approach)	95th %ile Queues > Storage Length (m)
North Shore Boulevard/ Lakeshore Road at Maple Avenue	Signal	Weekday a.m.	D	41.2	0.98 (EBL) 0.97 (NBT)	35.1 > 30m (EBL) 39.6 > 30m (WBL) 77.5 > 60m (NBL)
		Weekday p.m.	D	47.6	0.96 (EBL) 0.96 (WBT) 0.99 (SBR)	35.8 > 30m (EBL) 36.1 > 30m (WBL) 72.3 > 60m (NBL) 54.3 > 45m (SBL)
Maple Avenue at Bellview Street	Stop	Weekday a.m.	C	15.6	None	None
		Weekday p.m.	D	26.8	None	None
Maple Avenue at Site Access – Entrance Only	Stop	Weekday a.m.	A	0.0	None	None
		Weekday p.m.	A	8.2	None	None
Maple Avenue at Site Access – Exit Only	Stop	Weekday a.m.	B	14.7	None	None
		Weekday p.m.	B	14.8	None	None

Note: The Level of Service of a Stop-Controlled intersection is based on the delay associated with the critical approach. The Level of Service of a signalized intersection is based on the average control delay per vehicle. 95th percentile queue analysis was completed using SimTraffic with 30 minutes recording time, 10 minutes seeding time, and an average of three runs.

As indicated in Table 2, the intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue is projected to operate at a Level of Service "D" during the weekday a.m. and p.m. peak periods. During the a.m. peak period, the overall delay is projected to increase by 4.9 seconds and no change in the Level of Service. During the p.m. peak period, the overall delay is projected to increase by 14.5 seconds. A maximum volume-to-capacity ratio of 0.99 is observed for the southbound right-turn movement during the weekday p.m. peak period. Given the high delays and the near-capacity operations of the intersection, it is recommended that the City monitor the signal timings and optimize the signal timings to reduce delays.

Similar to the existing conditions, some of the storage lengths are shown to be exceeding the available storage length during the weekday a.m. and p.m. peak hours at the intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue. Therefore, queues may occasionally extend into the tapers and adjacent through lanes during peak periods.

The intersection of Maple Avenue at Bellview Street operates at a Level of Service "C" and "D" during the weekday a.m. and p.m. peak periods, with average delays per vehicle of 15.6 and 26.8

seconds, respectively. No individual movements are operating with a volume to capacity ratio above 0.85.

Operational analyses of future background traffic volumes indicate that reserve capacity is available for future traffic volume growth on the boundary road network.

5.0 Development Proposal

The subject lands cover approximately 0.28 ha and currently consists of 'Maple Villa'- Long Term Care Centre. There are currently two accesses, one ingress and one egress, onto Maple Avenue. The property, located in downtown Burlington, is bounded by Maple Avenue to the west, rental apartment buildings to the north and south, and a municipal parking lot with 74 spots to the east.

The project proposal is for an 11-storey residential apartment building consisting of 140 units. One (1) full movement site access is proposed at Maple Avenue. Refer to the Site Plan, prepared by Michael Spaziani Architect Inc., illustrated in Figure1, updated in October 2020, containing the keymap for the site location.

5.1 Site Generated Traffic

The proposed development will result in additional vehicles on the boundary road network that previously did not exist. The proposed development will also result in additional turning movements at the boundary road intersections.

The trip generation of the proposed development was forecasted using the rates provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition.

Land use Category 222 "Multifamily Housing (High Rise)" was used to forecast the trips generated by the development. The forecasted new trips are tabulated in Table 3.

As per the correspondence with the City Staff, a 10% non-auto modal split was applied to all trips generated by the proposed site.

Table 3: Trip Generation

ITE Category	Units	Roadway Peak Hour	Rate/Equation Used	Number of Trips		
				Inbound	Outbound	Total
Multifamily Housing-High Rise (LUC 222)	140	Weekday a.m.	T = 0.28(X) + 12.86	10	33	43
		Weekday p.m.	T = 0.34(X) + 8.56	31	19	50
New Trips		**Weekday a.m.**		**12**	**33**	**45**
		Weekday p.m.		**31**	**19**	**50**

Note: The number of trips reflects the 10% non-auto modal split reduction.

The proposed development is expected to generate 43 two-way (12 inbound and 33 outbound) trips during the weekday a.m. peak hour and 50 two-way (31 inbound and 19 outbound) trips during the weekday p.m. peak hour.

The long term housing currently on the subject lands generate 17 two-way trips during the weekday a.m. peak hour and 27 two-way trips during the weekday p.m. peak hour. The net increase expected is summarized in Table 4.

Table 4: Net Traffic Generation

Land Use	Parameter	Weekday a.m. Peak Hour			Weekday p.m. Peak Hour		
		In	Out	Total	In	Out	Total
Existing: Assisted Living-93 Beds (LUC 254)	Average Rate/Fitted Curve	0.18			0.29		
	ITE Generated Trips	4	13	17	13	14	27
	Non-Auto Trips (Per TTS)	0	0	0	0	0	0
	Total Trips	4	13	17	13	14	27
Proposed: Multifamily Housing-High Rise-140 Units (LUC 222)	Average Rate/Fitted Curve	T = 0.28(X) + 12.86			T = 0.34(X) + 8.56		
	ITE Generated Trips	12	36	48	34	22	56
	Non-Auto Trips (Per TTS)	2	3	5	3	3	6
Total Trips		10	33	43	31	19	50
Net Generated Trips		**6**	**20**	**26**	**18**	**5**	**23**

As shown in Table 4, the proposed development will result in additional 26 two-way trips in the weekday a.m. peak hour and 23 two-way trips in the weekday p.m. peak hour vehicles on the boundary road network that previously did not exist.

5.2 Trip Distribution and Assignment

2016 Transportation Tomorrow Survey (TTS) data, provided in Appendix F, was used to determine the trip distribution for the proposed development. Table 5 below outlines the trip distribution for the proposed development, divided into period and direction of travel.

Figure 4 illustrates the assumed trip distribution for the proposed development, and Figure 5 illustrates the assumed trip assignment for the proposed development.

Table 5: Site Distribution

	a.m. Peak Hour	p.m. Peak Hour
Direction	In (Out)	In (Out)
North	20% (25%)	20% (20%)
South	53% (48%)	53% (55%)
East	10% (15%)	15% (13%)
West	18% (13%)	13% (13%)

6.0 Future Total Conditions

6.1 Intersection Operations

Traffic operations at the study intersections were analyzed with the addition of the site generated traffic. The total traffic volumes are illustrated in Figure 6. Table 6 outlines the 2025 total traffic Levels of Service.Detailed capacity analysis worksheets are included in Appendix D.

Table 6: 2025 Future Total Level of Service

Intersection	**Control**	**Peak Hour**	**Level of Service**	**Average Delay per vehicle** (s)	**V/C Ratio(s) > 0.85** (Approach)	**95th %ile Queues > Storage Length** (m)
North Shore Boulevard/ Lakeshore Road at Maple Avenue	Signal	Weekday a.m.	D	41.8	0.98 (EBL) 0.97 (NBT)	34.8 > 30m (EBL) 39.0 > 30m (WBL) 77.5 > 60m (NBL)
		Weekday p.m.	D	47.8	0.94 (EBL) 0.98 (WBT) 0.98 (SBR)	37.7 > 30m (EBL) 36.0 > 30m (WBL) 80.3 > 60m (NBL) 46.4 > 45m (SBL)
Maple Avenue at Bellview Street	Stop	Weekday a.m.	C	15.8	None	None
		Weekday p.m.	D	27.1	None	None
Maple Avenue at Site Access	Stop	Weekday a.m.	C	15.5	None	None
		Weekday p.m.	C	15.7	None	None

Note: The Level of Service of a Stop-Controlled intersection is based on the delay associated with the critical approach. The Level of Service of a signalized intersection is based on the average control delay per vehicle. 95th percentile queue analysis was completed using SimTraffic with 30 minutes recording time, 10 minutes seeding time, and an average of three runs.

The addition of site-generated traffic to the roadway system will have a minimal effect on the operations of North Shore Boulevard/Lakeshore Road at Maple Avenue intersection during the a.m. and p.m. peak periods. The Levels of Service will remain unchanged during the peak periods. The average delay is expected to increase by 0.6 seconds during the morning peak period and increase by 0.2 seconds during the evening peak period. The average delay per vehicle is expected to decrease in future total conditions than future background conditions since there is a better utilization of green time for the through movements on the minor approach. Given the high delays and the near-capacity operations of the intersection, it is recommended that the City monitor the signal timings and optimize the signal timings to reduce delays.

Similar to the existing conditions, some of the storage lengths are shown to be exceeding the available storage length during the weekday a.m. and p.m. peak hours at the intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue. Therefore, queues may occasionally extend into the tapers and adjacent through lanes during peak periods.

The intersection of Maple Avenue at Bellview Street operates at a Level of Service "C" and "D" during the weekday a.m. and p.m. peak periods, with average delays per vehicle of 15.8 and 27.1 seconds, respectively. No individual movements are operating with a volume to capacity ratio above 0.85.

The intersection of Maple Avenue at the proposed site access will operate at Level of Service "C" during the weekday a.m. and p.m. peak periods, with average delays per vehicle of 15.5 and 15.7 seconds, respectively. No individual movements are operating with a volume to capacity ratio above 0.85.

Operational analyses of future total traffic volumes indicate that reserve capacity is available for future traffic volume growth on the boundary road network.

7.0 Parking Requirements

7.1 Parking Requirements – City of Burlington Zoning By-Law 2020

Section 2.25.4 of the City of Burlington Zoning By-Law 2020 was used to calculate the number of parking spaces required for the proposed 140-unit residential building. The parking requirements for the residential development are outlined in Table 7. Table 8 shows the City's approved but not yet adopted Zoning By-Law parking rates. Relevant Zoning By-Law Excerpts are included in Appendix G. In addition to the Zoning By-Law, the *Burlington – City Wide Parking Standards Review* report was also reviewed. The parking rate recommendations as outlined in the city wide parking review report are provided in Table 9.

Table 7: Zoning By-Law Parking Requirement

Use	Parking Requirement	# of Units	Total Parking Spaces Required	Total Parking Spaces Provided	Surplus/ Deficit
Residential Development	1.25 occupant spaces per one bedroom unit	80 Units	100 spaces	162 parking spaces provided on site, **15 parking spaces are leased from Hydro One**	Deficit of 61 Spaces
	1.50 occupant spaces per two bedroom unit	60 Units	90 spaces		
	1.75 occupant spaces per three or more bedroom	0 Units	0 spaces		
	0.35 visitor spaces per unit	140 (Total Units)	49 spaces		
Total		**140 Units**	**239 Spaces**	**177 Spaces**	

Table 8: Amended Zoning By-Law Parking Requirement

Use	Parking Requirement	# of Units	Total Parking Spaces Required	Total Parking Spaces Provided	Surplus/ Deficit
Residential Development	1.00 occupant spaces per one bedroom unit	80 Units	80 spaces	162 parking spaces provided on site, **15 parking spaces are leased from Hydro One**	Deficit of 15 Spaces
	1.25 occupant spaces per two bedroom unit	60 Units	75 spaces		
	1.50 occupant spaces per three or more bedroom	0 Units	0 spaces		
	0.25 visitor spaces per unit	140 (Total Units)	35 spaces		
	1 additional space per 75 units for the use of maintenance vehicles servicing the site		2 spaces		
Total		**140 Units**	**192 Spaces**	**177 Spaces**	

Table 9: Burlington – City Wide Parking Standards Review Rates

Use	Parking Requirement*	# of Units	Total Parking Spaces Required	Total Parking Spaces Provided	Surplus/ Deficit
Residential Development	1.00 resident spaces per unit + 0.25 visitor spaces per unit	140 units	140 resident spaces + 35 visitor spaces	162 parking spaces provided on site, **15 parking spaces are leased from Hydro One**	Surplus of 2 spaces
Total			**175 Spaces**	**177 Spaces**	

Note *: Based on 'Intensificiation Areas: Minimum' per Exhibit 4.1 and Exhibit 6.17

As indicated in Table 7, per the Zoning By-Law 2020, 239 spaces are required for the proposed residential development; 192 spaces are required per the Amended Zoning-By-Law and 175 spaces are required per the City Wide Parking Standards Review Rates.

Based on the site plan provided in Figure 1, 162 parking spaces are provided on site along with 15 parking spaces that are leased from Hydro One at a parking lot adjacent to the site. These additional parking spaces are fully accessible from the site. The additional parking spaces have been leased from Hydro One since 2015, and were leased by the previous land owners for the last 15 years. The Site Plan proposes 162 spaces on site, for a rate of 1.16 per unit, and with the combination of the parking spaces provided on site and the leased parking spaces, a total of 177 parking spaces are available (1.26 parking spaces per unit), thus satisfying the City Wide Parking Standards Review rates.

Based on the teleconference with City Staff on August 6, 2020, the parking spaces leased from Hydro One can be included within the parking calculations given the long history of the site with Hydro One.

8.0 Transportation Demand Management (TDM)

Transportation Demand Management (TDM) refers to various strategies to reduce traffic congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. In summary, TDM works to change how, when, where and why people travel.

TDM strategies have multiple benefits, including the following:

- Reduced auto-related emissions to improve air quality
- Decreased traffic congestion to reduce travel time
- Increased travel options for residents and commuters
- Reduced personal transportation costs and energy consumption
- Support Provincial Smart Growth Objectives

The above-combined benefits will assist in creating a more active and livable community.

8.1 TDM Strategies Identification

8.1.1 Walking / Cycling

The City of Burlington is a pedestrian and cycling supportive community that embraces the "complete streets" concept by encouraging commuter and recreational travel by walking, cycling and using public transit through a safe and desirable Municipality-wide network of on-road and off-road pedestrian and cycling facilities.

Currently, there are sidewalks available on all roads in the vicinity of the site. Maple Avenue and Lakeshore Road have marked bike lanes in both directions, and North Shore Boulevard East has sharrows marked on the pavement.

Per the City of Burlington Zoning By-Law No. 2020, bicycle parking spaces are not required for residential uses. However, 70 long term bicycle parking spaces and 24 short term bicycle parking spaces are provided for residents and visitors, as shown in the Site Plan (See Figure 1).

8.2 TDM Strategies Implementation

TDM programs nationally have experienced a wide range of implementation success. This TDM plan will achieve the desired outcome of reduced dependency on the single-occupant vehicle (SOV) from a holistic perspective.

8.2.1 Transit Incentive

An increase in transit use is fundamental to the overall reduction of automobile use. People associate utilities with each mode of transportation (such as safety, reliability, comfort, accessibility, speed, cost and travel time). Their mode choice is based on the relative costs associated with one versus another mode. The two (2) characteristics that will most likely influence mode choice are monetary cost and travel time.

Transit productivity is a measure of return on investment in the transit system. It measures how many travellers use the transit service provided in a region. Local buses with few passengers suggest that transit systems are not providing transportation benefits consistent with their capital and operating costs. Having more passengers on each bus generates more revenue for transit agencies and can result in better air quality and less congestion. Moreover, transit service levels (i.e. network coverage and frequency) have a strong positive correlation with transit demand (i.e. ridership).

To encourage residents to use the Burlington transit service, the Owner may consider providing and distributing (one (1) time) prepaid and fee-waived complimentary PRESTO cards. This subsidized transit card will provide a financial incentive to encourage public transit, especially for 'first-time' users, to try local transit services as a primary mode of transportation. The amount and provision of PRESTO cards are subject to the Owner's discretion.

8.2.2 Marketing

It is recommended that an information package be made available by the City/Owner to inform new/prospective residents with alternative travelling options. It is recommended that the Owner consults with the City to provide the following materials to promote active transportation:

- Burlington Transit Map
- Burlington Trails Map
- Burlington Cycling Map

In addition to the above-noted materials, the information package may also include information on transit schedules (i.e. Burlington Transit) to assist residents in planning their trips (i.e. to/from work/school) utilizing the existing and growing transit network system. A location map will also be prepared to indicate the nearby facilities and points of interest (i.e. retail store, grocery store, school, community center and library) within convenience and comfortable walking distance to further discourage vehicle dependency.

9.0 Conclusion

The findings and conclusions of our analysis are represented as follows:

- The study area intersections are operating with Level of Service "D" or better in the existing traffic conditions during both the a.m. and p.m. peak hours.
- During both the a.m. and p.m. peak hours in the future background traffic conditions for the horizon year 2025, all the key intersections are expected to operate with Level of Service "D" or better. The intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue is projected to operate close to capacity during the weekday a.m. and p.m. peak period.
- The proposed development is expected to generate 43 two-way (12 inbound and 33 outbound) trips during the weekday a.m. peak hour and 50 two-way (31 inbound and 19 outbound) trips during the weekday p.m. peak hour.
- The proposed development is expected to have a negligible impact on the surrounding road network as future total traffic is expected to operate similarly to the future background scenario (below-capacity and with an acceptable level of service) in the horizon year 2025;

- The proposed full-movement access at Maple Avenue is anticipated to function at a Level of Service of "C" and well below-capacity.

- Given the high delays and the near-capacity operations of the intersection of North Shore Boulevard/Lakeshore Road at Maple Avenue under future background and future total conditions, it is recommended that the City monitor the signal timings and optimize the signal timings to reduce delays.

- 162 parking spaces are provided on site and an additional 15 parking spaces are available under a lease agreement with Hydro One at the parking lot adjacent to the site and is fully accessible from the site. With the combination of the parking spaces provided on site and the parking spaces under lease, a total of 177 parking spaces are available, thus providing a total parking rate of 1 parking space per unit for residents, 0.26 spaces per unit for visitors.

- The analysis undertaken herein was prepared using the most recent Site Plan. Any minor changes to the plan will not materially affect the conclusions contained within this report.

- The proposed development can be supported by a traffic operations perspective as the site generated traffic will have a negligible effect on the operations of the public roadway system.

We trust that this review satisfies any transportation concerns associated with the Site Plan for this development. Please feel free to contact the undersigned for any further information required.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.



R. Aaron Wignall
Associate, Transportation

C.F. CROZIER & ASSOCIATES INC.



Kavleen Sachdeva
Engineering Intern, Transportation

I:\1600\1609-Better Life Retirement\5022-441 Maple Ave\Reports\Traffic\2020.10.26 Final TIS.docx

APPENDIX A

Correspondence

Kavleen Sachdeva

From: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Sent: Monday, August 13, 2018 11:38 AM
To: Kavleen Sachdeva
Cc: Popovich, Bobby
Subject: RE: 441 Maple Avenue Terms of Reference

Hi Kavleen,
I reviewed the Terms of Reference and I am satisfied with your proposal.
I would just like to add that when it comes to on-site parking, please refer to the recommended rates from City's parking study:
https://www.burlington.ca/en/services-for-you/resources/Planning_and_Development/City-Wide-Parking-Study/Burlington-Parking-Standards-Final-Consolidated-Report_2017-09-22_Updated.pdf

- Please provide details of any planned roadway/transit improvement in the study area within the next five years Maple Avenue resurfacing is scheduled for 2019/2020. Same number of vehicle lanes will remain.
- Please provide the growth rate to be used for Maple Avenue, Bellview Street, and North Shore Boulevard East Please use 2% for growth rate
- Please provide the signal timing plan for the signalized intersection of Maple Avenue/Lakeshore Road at North Shore Boulevard East My coworker Bobby Popovich will be able to provide you with more info for signal timing plan
- Please provide us with any further background developments that are to be included in the analysis No other background developments.

Thanks,
Dan Ozimkovic, C.E.T
Transportation Planning Technologist
Transportation Services
City of Burlington
(905) 335-7671 ext. 7485
danijel.ozimkovic@burlington.ca

From: Minaji, Rosalind
Sent: Thursday, August 09, 2018 9:56 AM
To: 'Kavleen Sachdeva'
Cc: Edgcumbe, Kaylan; Ozimkovic , Danijel
Subject: RE: 441 Maple Avenue Terms of Reference

Hi Kavleen:
Please follow up with Transportation Services staff copied on this email. I only forwarded your email on Tuesday. I'm sure you can appreciate that in the summer months people are on vacation and it can take a little more time to receive a response.
-Rosalind

Rosalind Minaji MCIP RPP
Coordinator of Development Review

Department of City Building | Planning Section
City of Burlington
426 Brant Street, Burlington L7R 3Z6
Phone: 905-335-7600 Ext. 7809
Fax: 905-335-7880
Email: rosalind.minaji@burlington.ca

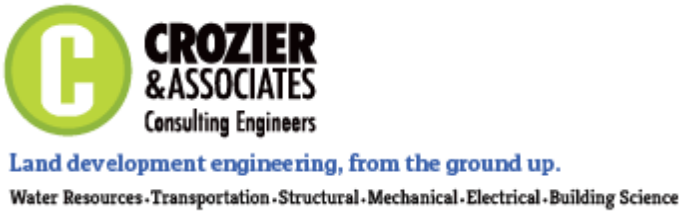
From: Kavleen Sachdeva [mailto:ksachdeva@cfcrozier.ca]
Sent: Thursday, August 09, 2018 9:33 AM
To: Minaji, Rosalind
Subject: RE: 441 Maple Avenue Terms of Reference

Hi Rosalind,

Just wanted to check in and ask when I can expect a reply regarding the workplan sent on Tuesday.

Thanks!

| **KAVLEEN SACHDEVA** | TRANSPORTATION E.I.T. | C.F. CROZIER & ASSOCIATES
| 2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
| cfcrozier.ca | ksachdeva@cfcrozier.ca | tel 905 875 0026



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From: Minaji, Rosalind <Rosalind.Minaji@burlington.ca>
Sent: Tuesday, August 7, 2018 12:02 PM
To: Kavleen Sachdeva <ksachdeva@cfcrozier.ca>
Cc: Aaron Wignall <awignall@cfcrozier.ca>
Subject: RE: 441 Maple Avenue Terms of Reference

Thank you Kavleen. John Zunic is no longer with the City.
I have forwarded your email to our current Transportation Services staff for a response.
Please do not proceed with the study until you hear from our staff.
Thank you.
-Rosalind

Rosalind Minaji MCIP RPP
Coordinator of Development Review
Department of City Building | Planning Section
City of Burlington
426 Brant Street, Burlington L7R 3Z6
Phone: 905-335-7600 Ext. 7809
Fax: 905-335-7880

Email: rosalind.minaji@burlington.ca

From: Kavleen Sachdeva [mailto:ksachdeva@cfcrozier.ca]
Sent: Tuesday, August 07, 2018 11:52 AM
To: Minaji, Rosalind; John JZ. Zaloznik
Cc: Aaron Wignall
Subject: 441 Maple Avenue Terms of Reference

Hi all,

We have been retained to complete a **Transportation Impact Study** and **Parking Justification Study** to support Zoning By-Law and Local Official Plan Amendments for the proposed 11-story consisting 163 units residential building at 441 Maple Avenue in the City of Burlington. One full movement access onto Maple Avenue is proposed with three underground parking levels and above ground parking for a total of 163 parking spaces.

We request your feedback regarding our study assumptions. I have attached the working Site Plan for your reference.

Study Methodology for the Transportation Impact Study

Study Area and Intersections to Assess

- The following intersections will be analyzed:
    - Maple Avenue at Bellview Street (Unsignalized),
    - Maple Avenue/Lakeshore Road at North Shore Boulevard East (signalized), and
    - Maple Avenue at Site Access (Unsignalized).

We will collect the traffic counts at existing intersections on a typical weekday during the morning (6:00 AM to 10:00 AM) and evening (3:00 PM to 7:00 PM) peak periods.

Analysis Periods and Scenarios

The weekday AM and PM peak hours for 2018 existing conditions, considering a 5-year horizon (2023) year background and total traffic conditions will be analyzed.

Background Developments

We will include the following development as part of our background development:

- OPA: 505-02/17 (ZBA: 520-08/17): 490 - 492 Brock Ave. and 1298 Ontario St. Ward 2

If any further developments should be included in our analysis, please let us know.

Future Background Traffic Growth Rate

- Please provide the growth rate that can be used for Maple Avenue, Bellview Street, and North Shore Boulevard East. Should this information not be available, an industry standard of two percent will be applied to through movements along the study intersections.

Future background traffic volume will be estimated for the study area to ensure that the analysis includes background traffic growth and growth from other developments in the area.

Trip Generation

Trip generation for the proposed development will be based on Trip Generation Manual, 10th Edition prepared by the Institute of Transportation Engineers (ITE) for Multifamily Housing (High-Rise) (land use code 222). To be more conservative the fitted curve equation will be used.

The information contained in the 2016 Transportation Tomorrow Survey (TTS) for zone 4057(the Subject Zone) has been reviewed. The summary of the non-auto modal split calculation is provided in the attached table.

- The subject zone TTS Zone have an existing non-auto modal split of approximately 10%.
- Trip distribution, assignments, and the modal splits will be based on the latest 2016 Transportation Tomorrow Survey (TTS).

Roadway/Transit Improvements

- Please provide details of any planned roadway/transit improvement in the study area.

Analysis Procedures

- Weekday AM and PM peak hours will be analyzed using the Synchro 10.0 analysis package and Highway Capacity Manual (HCM) procedures.

Transportation Demand Management Plan

- We will also include several transportation demand management measures to support active transportation and transit as an attempt to reduce the number of auto trips to/from the proposed development.

Study Methodology for the Parking Justification Study

The key tasks are involved in this study are:

- Calculate the parking supply required by the City By-Law number 2020 for the site
- Conduct parking utilization surveys of one surrogate site with a residential building that has similar uses and characteristics to the project site between the weekday a.m. and p.m. peak hours (7:00 a.m.-10:00 a.m., 3:00 p.m.-7:00 p.m.)
- Forecast the peak parking demand using the Institute of Transportation Engineers' data.
- Compare the parking space demand with the parking spaces provided and determine whether the parking supply is sufficient to meet the calculated demand.

Could you please provide any comments you may have on the above ToR and provide the following information for inclusion in the study:

- Please provide details of any planned roadway/transit improvement in the study area within the next five years
- Please provide the growth rate to be used for Maple Avenue, Bellview Street, and North Shore Boulevard East
- Please provide the signal timing plan for the signalized intersection of Maple Avenue/Lakeshore Road at North Shore Boulevard East
- Please provide us with any further background developments that are to be included in the analysis

I hope the above is acceptable. Should you have any questions or concerns, please feel free to contact myself or my colleague Aaron Wignall copied on this email.

Regards,

| **KAVLEEN SACHDEVA** | TRANSPORTATION E.I.T. | C.F. CROZIER & ASSOCIATES

| 2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4

| cfcrozier.ca | ksachdeva@cfcrozier.ca | tel 905 875 0026



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APPENDIX B

Traffic Data and Signal Timing Plans

Turning Movement Count (1 . MAPLE AVE & BELLVIEW ST)

Start Time	N Approach MAPLE AVE					S Approach MAPLE AVE					W Approach BELLVIEW ST					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	U-Turn N:N	Peds N:	Approach Total	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Left W:N	U-Turn W:W	Peds W:	Approach Total		
06:00:00	1	23	1	0	25	14	0	0	0	14	1	0	0	1	1	40	
06:15:00	0	28	0	0	28	24	0	0	0	24	2	1	0	2	3	55	
06:30:00	0	33	0	0	33	42	0	0	0	42	0	1	0	1	1	76	
06:45:00	0	30	0	0	30	54	0	0	0	54	1	1	0	1	2	86	257
07:00:00	0	54	0	0	54	57	1	0	0	58	2	2	0	1	4	116	333
07:15:00	0	60	0	0	60	58	2	0	0	60	5	1	0	0	6	126	404
07:30:00	1	81	0	0	82	83	1	0	1	84	4	4	0	0	8	174	502
07:45:00	2	57	0	0	59	93	2	0	0	95	5	4	0	3	9	163	579
08:00:00	0	79	0	0	79	84	2	0	0	86	3	3	0	3	6	171	634
08:15:00	0	65	0	0	65	76	4	0	0	80	2	3	0	2	5	150	658
08:30:00	1	64	0	0	65	68	2	0	0	70	5	2	0	2	7	142	626
08:45:00	2	74	0	0	76	77	3	0	0	80	2	3	0	3	5	161	624
09:00:00	2	68	0	0	70	97	5	0	0	102	6	4	0	3	10	182	635
09:15:00	0	49	0	0	49	77	2	0	0	79	3	6	0	1	9	137	622
09:30:00	4	61	0	0	65	77	1	0	0	78	2	3	0	0	5	148	628
09:45:00	0	51	0	0	51	92	1	0	0	93	3	2	0	1	5	149	616
BREAK																	
15:00:00	1	126	0	0	127	90	5	0	0	95	0	4	0	5	4	226	
15:15:00	5	111	0	0	116	101	3	0	0	104	2	1	0	3	3	223	
15:30:00	3	125	0	0	128	123	2	0	0	125	3	5	0	2	8	261	
15:45:00	5	150	0	0	155	110	2	0	0	112	5	5	0	6	10	277	987
16:00:00	6	158	0	0	164	97	2	0	0	99	2	3	0	4	5	268	1029
16:15:00	7	178	0	0	185	99	3	0	0	102	5	2	0	1	7	294	1100
16:30:00	4	184	0	0	188	90	3	0	0	93	3	6	0	0	9	290	1129

16:45:00	4	223	0	0	227	96	4	0	0	100	3	4	0	1	7	334	1186
17:00:00	4	236	0	0	240	78	2	0	0	80	3	2	0	2	5	325	1243
17:15:00	6	192	0	0	198	69	5	0	0	74	3	5	0	0	8	280	1229
17:30:00	7	139	0	0	146	78	3	0	0	81	3	3	0	1	6	233	1172
17:45:00	5	133	0	0	138	59	3	0	0	62	4	1	0	3	5	205	1043
18:00:00	2	119	0	0	121	63	2	0	0	65	1	0	0	4	1	187	905
18:15:00	5	99	0	0	104	71	2	0	0	73	2	4	0	2	6	183	808
18:30:00	0	80	0	0	80	50	5	0	0	55	3	2	0	3	5	140	715
18:45:00	3	82	0	0	85	64	1	0	0	65	5	0	0	1	5	155	665
Grand Total	80	3212	1	0	3293	2411	73	0	1	2484	93	87	0	62	180	**5957**	-
Approach%	2.4%	97.5%	0%		-	97.1%	2.9%	0%		-	51.7%	48.3%	0%		-	**-**	-
Totals %	1.3%	53.9%	0%		55.3%	40.5%	1.2%	0%		41.7%	1.6%	1.5%	0%		3%	**-**	-
Heavy	1	2	0		-	1	0	0		-	1	0	0		-	**-**	-
Heavy %	1.3%	0.1%	0%		-	0%	0%	0%		-	1.1%	0%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

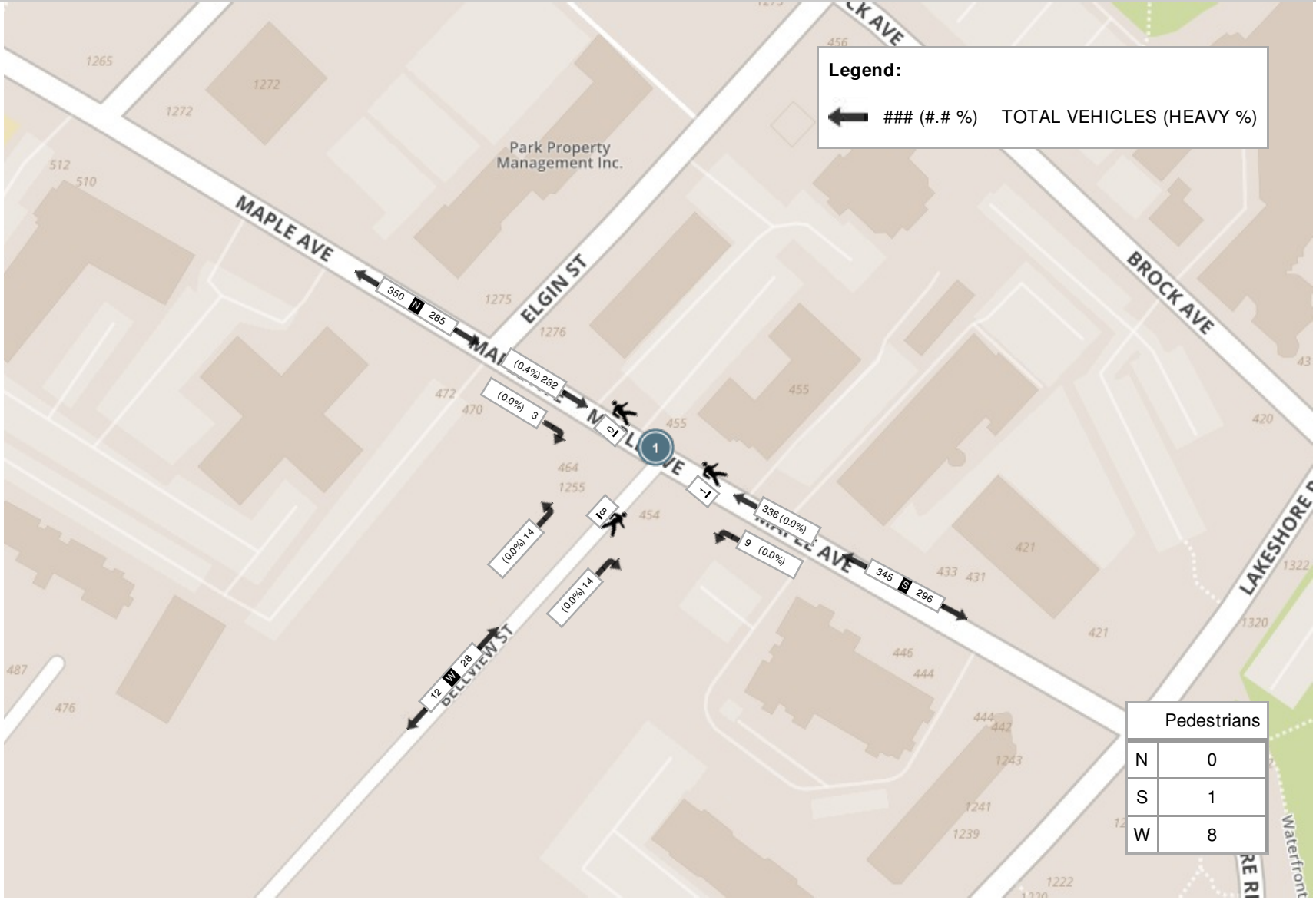
Peak Hour: 07:30 AM - 08:30 AM Weather: Unknown (22.8 °C)

Start Time	N Approach MAPLE AVE					S Approach MAPLE AVE					W Approach BELLVIEW ST					Int. Total (15 min)
	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	
07:30:00	1	81	0	0	82	83	1	0	1	84	4	4	0	0	8	174
07:45:00	2	57	0	0	59	93	2	0	0	95	5	4	0	3	9	163
08:00:00	0	79	0	0	79	84	2	0	0	86	3	3	0	3	6	171
08:15:00	0	65	0	0	65	76	4	0	0	80	2	3	0	2	5	150
Grand Total	3	282	0	0	285	336	9	0	1	345	14	14	0	8	28	**658**
Approach%	1.1%	98.9%	0%		-	97.4%	2.6%	0%		-	50%	50%	0%		-	**-**
Totals %	0.5%	42.9%	0%		43.3%	51.1%	1.4%	0%		52.4%	2.1%	2.1%	0%		4.3%	**-**
PHF	0.38	0.87	0		0.87	0.9	0.56	0		0.91	0.7	0.88	0		0.78	**-**
Heavy	0	1	0		1	0	0	0		0	0	0	0		0	**-**
Heavy %	0%	0.4%	0%		0.4%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Lights	3	273	0		276	325	9	0		334	14	14	0		28	**-**
Lights %	100%	96.8%	0%		96.8%	96.7%	100%	0%		96.8%	100%	100%	0%		100%	**-**
Mediums	0	8	0		8	11	0	0		11	0	0	0		0	**-**
Mediums %	0%	2.8%	0%		2.8%	3.3%	0%	0%		3.2%	0%	0%	0%		0%	**-**
Articulated Trucks	0	1	0		1	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0%	0.4%	0%		0.4%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	8	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	11.1%		-	-	-	88.9%		**-**

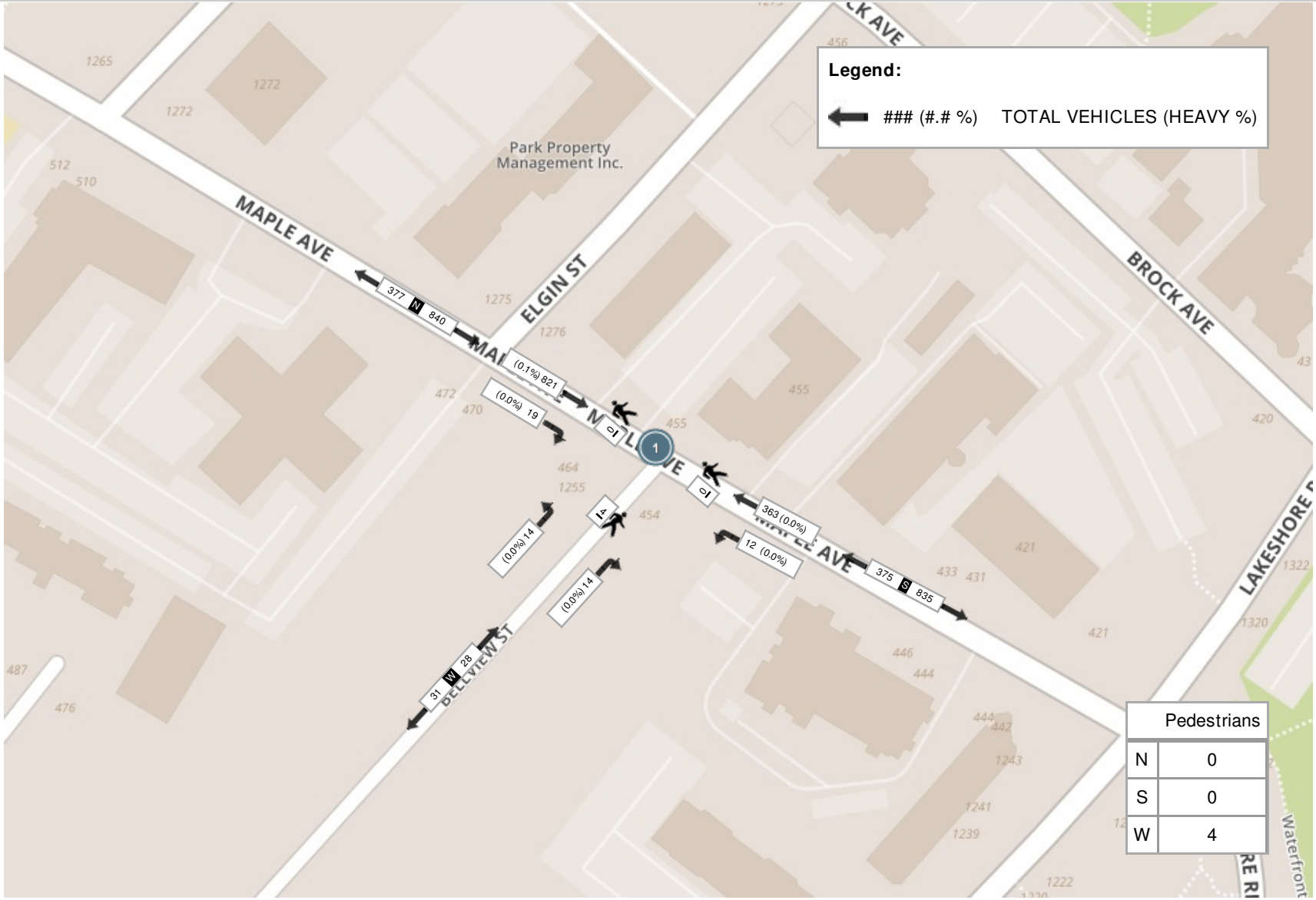
Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast (26.6 °C)

Start Time	N Approach MAPLE AVE					S Approach MAPLE AVE					W Approach BELLVIEW ST					Int. Total (15 min)
	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	
16:15:00	7	178	0	0	185	99	3	0	0	102	5	2	0	1	7	294
16:30:00	4	184	0	0	188	90	3	0	0	93	3	6	0	0	9	290
16:45:00	4	223	0	0	227	96	4	0	0	100	3	4	0	1	7	334
17:00:00	4	236	0	0	240	78	2	0	0	80	3	2	0	2	5	325
Grand Total	19	821	0	0	840	363	12	0	0	375	14	14	0	4	28	**1243**
Approach%	2.3%	97.7%	0%		-	96.8%	3.2%	0%		-	50%	50%	0%		-	**-**
Totals %	1.5%	66%	0%		67.6%	29.2%	1%	0%		30.2%	1.1%	1.1%	0%		2.3%	**-**
PHF	0.68	0.87	0		0.88	0.92	0.75	0		0.92	0.7	0.58	0		0.78	**-**
Heavy	0	1	0		1	0	0	0		0	0	0	0		0	**-**
Heavy %	0%	0.1%	0%		0.1%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Lights	19	811	0		830	352	12	0		364	14	14	0		28	**-**
Lights %	100%	98.8%	0%		98.8%	97%	100%	0%		97.1%	100%	100%	0%		100%	**-**
Mediums	0	9	0		9	11	0	0		11	0	0	0		0	**-**
Mediums %	0%	1.1%	0%		1.1%	3%	0%	0%		2.9%	0%	0%	0%		0%	**-**
Articulated Trucks	0	1	0		1	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0%	0.1%	0%		0.1%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	4	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	100%		**-**

Peak Hour: 07:30 AM - 08:30 AM Weather: Unknown (22.8 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast (26.6 °C)



Turning Movement Count (2 . MAPLE AVE & LAKESHORE RD AT NORTH SHORE BLVD E)

Start Time	N Approach MAPLE AVE						E Approach LAKESHORE RD						S Approach MAPLE AVE						W Approach NORTH SHORE BLVD E						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
06:00:00	17	4	3	0	15	24	5	36	12	0	5	53	23	4	2	0	6	29	7	92	11	0	2	110	216	
06:15:00	19	6	8	0	6	33	7	48	6	0	5	61	51	8	0	0	4	59	5	127	15	0	4	147	300	
06:30:00	20	6	8	0	7	34	1	58	16	0	4	75	37	14	1	0	6	52	18	165	27	0	4	210	371	
06:45:00	22	9	6	0	5	37	8	63	13	0	5	84	53	14	1	0	7	68	30	123	35	0	5	188	377	1264
07:00:00	19	23	8	0	9	50	5	71	12	0	3	88	43	20	4	0	3	67	18	94	26	0	6	138	343	1391
07:15:00	47	14	9	0	7	70	7	89	16	0	3	112	46	24	10	0	0	80	34	168	35	0	1	237	499	1590
07:30:00	51	20	9	0	9	80	8	116	27	0	4	151	74	27	2	0	2	103	21	199	45	0	1	265	599	1818
07:45:00	45	17	9	0	12	71	9	118	29	0	3	156	59	34	4	0	2	97	33	173	44	0	7	250	574	2015
08:00:00	58	16	7	0	4	81	14	129	21	0	6	164	54	22	6	0	1	82	30	184	49	0	1	263	590	2262
08:15:00	45	18	6	0	8	69	15	123	35	0	9	173	63	18	7	0	3	88	28	177	47	0	3	252	582	2345
08:30:00	51	12	7	0	11	70	10	117	35	0	3	162	52	26	4	0	1	82	24	176	31	0	7	231	545	2291
08:45:00	45	11	21	0	5	77	11	106	34	0	2	151	55	21	9	0	2	85	19	176	48	0	3	243	556	2273
09:00:00	43	13	13	0	6	69	16	88	16	0	2	120	54	22	5	0	0	81	20	201	55	0	6	276	546	2229
09:15:00	34	14	8	0	6	56	13	117	32	0	7	162	39	17	10	0	4	66	17	203	49	0	2	269	553	2200
09:30:00	30	19	16	0	6	65	16	101	29	0	2	146	38	25	11	0	5	74	21	151	35	0	1	207	492	2147
09:45:00	26	13	11	0	1	50	23	94	29	0	0	146	37	23	17	0	1	77	18	150	43	0	1	211	484	2075
BREAK																										
15:00:00	59	34	34	0	10	127	21	186	32	0	13	239	48	29	26	0	9	103	11	117	36	0	5	164	633	
15:15:00	57	30	25	0	8	112	15	174	47	1	5	237	60	44	22	0	7	126	18	112	43	0	5	173	648	
15:30:00	73	23	23	0	9	119	20	226	51	0	9	297	74	47	43	0	6	164	17	119	62	0	2	198	778	
15:45:00	84	42	28	0	5	154	15	183	61	0	14	259	47	35	24	0	8	106	16	158	60	0	10	234	753	2812
16:00:00	89	30	28	0	5	147	14	238	51	0	5	303	53	30	37	0	10	120	17	149	54	0	2	220	790	2969
16:15:00	117	55	18	0	6	190	17	218	44	0	3	279	41	31	20	0	3	92	24	108	50	0	5	182	743	3064
16:30:00	115	43	26	0	5	184	20	228	63	0	3	311	55	41	19	0	1	115	23	137	37	0	2	197	807	3093
16:45:00	128	66	24	0	7	218	17	256	53	0	3	326	35	25	11	0	3	71	15	150	53	0	4	218	833	3173
17:00:00	163	57	18	0	11	238	13	270	54	0	6	337	37	20	6	0	5	63	26	130	41	0	0	197	835	3218
17:15:00	138	40	20	0	2	198	9	262	62	0	0	333	27	12	11	0	2	50	13	150	52	0	0	215	796	3271
17:30:00	90	29	19	0	12	138	19	242	56	0	4	317	26	13	15	0	0	54	11	138	42	0	5	191	700	3164
17:45:00	79	38	15	0	5	132	14	223	33	0	9	270	19	11	10	0	1	40	19	132	31	0	2	182	624	2955
18:00:00	63	26	29	0	6	118	14	179	39	0	6	232	24	15	11	0	3	50	9	108	38	1	7	156	556	2676
18:15:00	64	20	21	0	5	105	21	138	36	0	1	195	26	9	15	0	4	50	16	105	47	0	4	168	518	2398

18:30:00	52	17	19	0	13	88	10	127	42	0	17	179	23	8	16	0	7	47	11	99	31	0	3	141	455	2153
18:45:00	46	17	23	0	4	86	19	104	24	0	5	147	18	10	10	0	3	38	16	109	37	0	0	162	433	1962
Grand Total	1989	782	519	0	230	3290	426	4728	1110	1	166	6265	1391	699	389	0	119	2479	605	4580	1309	1	110	6495	**18529**	-
Approach%	60.5%	23.8%	15.8%	0%		-	6.8%	75.5%	17.7%	0%		-	56.1%	28.2%	15.7%	0%		-	9.3%	70.5%	20.2%	0%		-	**-**	-
Totals %	10.7%	4.2%	2.8%	0%		17.8%	2.3%	25.5%	6%	0%		33.8%	7.5%	3.8%	2.1%	0%		13.4%	3.3%	24.7%	7.1%	0%		35.1%	**-**	-
Heavy	0	0	2	0		-	0	6	1	0		-	1	0	2	0		-	2	5	1	0		-	**-**	-
Heavy %	0%	0%	0.4%	0%		-	0%	0.1%	0.1%	0%		-	0.1%	0%	0.5%	0%		-	0.3%	0.1%	0.1%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

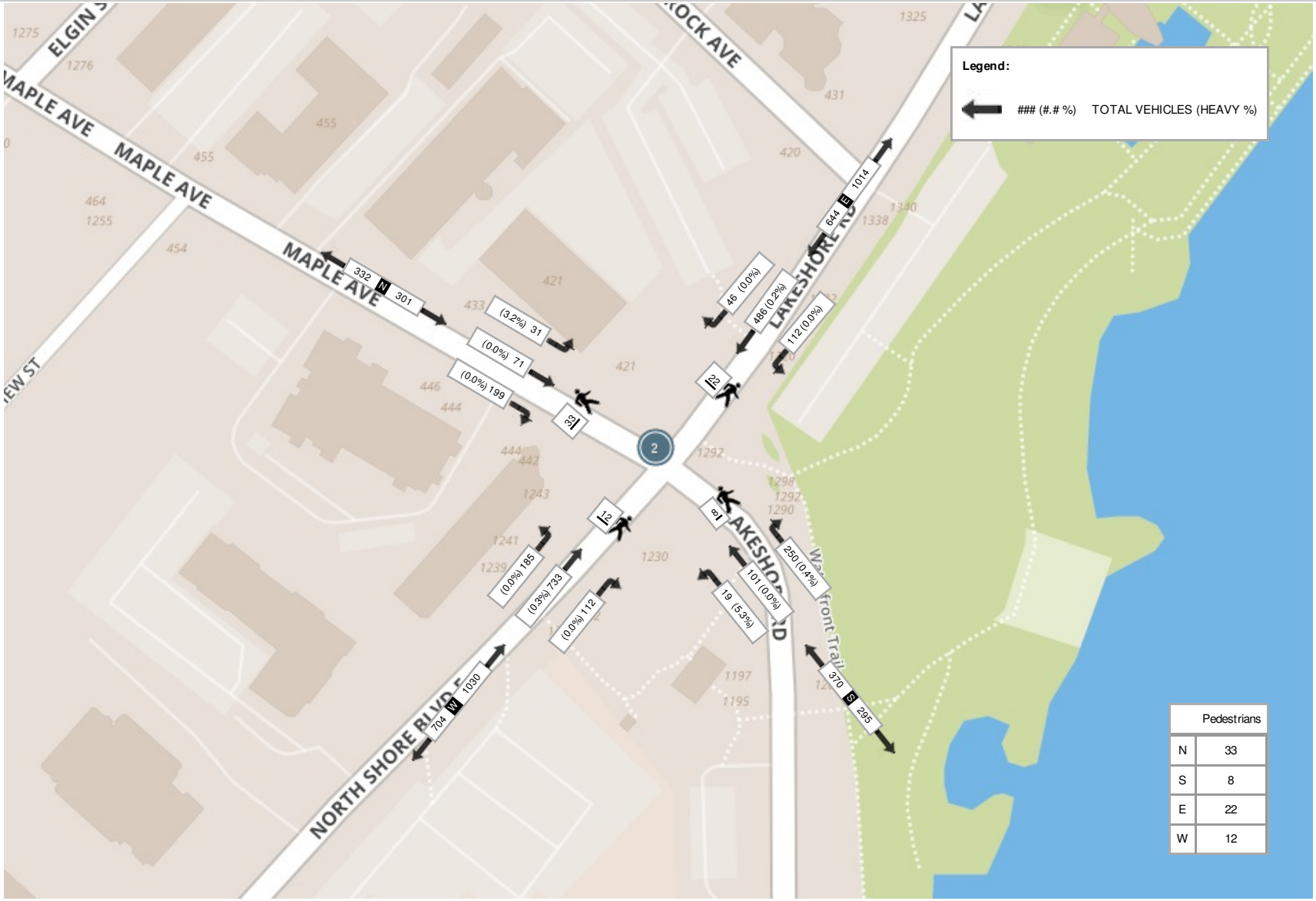
Peak Hour: 07:30 AM - 08:30 AM Weather: Unknown (22.8 °C)

Start Time	N Approach MAPLE AVE						E Approach LAKESHORE RD						S Approach MAPLE AVE						W Approach NORTH SHORE BLVD E						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:30:00	51	20	9	0	9	80	8	116	27	0	4	151	74	27	2	0	2	103	21	199	45	0	1	265	599
07:45:00	45	17	9	0	12	71	9	118	29	0	3	156	59	34	4	0	2	97	33	173	44	0	7	250	574
08:00:00	58	16	7	0	4	81	14	129	21	0	6	164	54	22	6	0	1	82	30	184	49	0	1	263	590
08:15:00	45	18	6	0	8	69	15	123	35	0	9	173	63	18	7	0	3	88	28	177	47	0	3	252	582
Grand Total	199	71	31	0	33	301	46	486	112	0	22	644	250	101	19	0	8	370	112	733	185	0	12	1030	**2345**
Approach%	66.1%	23.6%	10.3%	0%		-	7.1%	75.5%	17.4%	0%		-	67.6%	27.3%	5.1%	0%		-	10.9%	71.2%	18%	0%		-	**-**
Totals %	8.5%	3%	1.3%	0%		12.8%	2%	20.7%	4.8%	0%		27.5%	10.7%	4.3%	0.8%	0%		15.8%	4.8%	31.3%	7.9%	0%		43.9%	**-**
PHF	0.86	0.89	0.86	0		0.93	0.77	0.94	0.8	0		0.93	0.84	0.74	0.68	0		0.9	0.85	0.92	0.94	0		0.97	**-**
Heavy	0	0	1	0		1	0	1	0	0		1	1	0	1	0		2	0	2	0	0		2	**-**
Heavy %	0%	0%	3.2%	0%		0.3%	0%	0.2%	0%	0%		0.2%	0.4%	0%	5.3%	0%		0.5%	0%	0.3%	0%	0%		0.2%	**-**
Lights	197	69	26	0		292	40	476	107	0		623	238	100	17	0		355	110	719	182	0		1011	**-**
Lights %	99%	97.2%	83.9%	0%		97%	87%	97.9%	95.5%	0%		96.7%	95.2%	99%	89.5%	0%		95.9%	98.2%	98.1%	98.4%	0%		98.2%	**-**
Mediums	2	2	4	0		8	6	9	5	0		20	11	1	1	0		13	2	12	3	0		17	**-**
Mediums %	1%	2.8%	12.9%	0%		2.7%	13%	1.9%	4.5%	0%		3.1%	4.4%	1%	5.3%	0%		3.5%	1.8%	1.6%	1.6%	0%		1.7%	**-**
Articulated Trucks	0	0	1	0		1	0	1	0	0		1	1	0	1	0		2	0	2	0	0		2	**-**
Articulated Trucks %	0%	0%	3.2%	0%		0.3%	0%	0.2%	0%	0%		0.2%	0.4%	0%	5.3%	0%		0.5%	0%	0.3%	0%	0%		0.2%	**-**
Pedestrians	-	-	-	-	33	-	-	-	-	-	22	-	-	-	-	-	8	-	-	-	-	-	12	-	**-**
Pedestrians%	-	-	-	-	44%		-	-	-	-	29.3%		-	-	-	-	10.7%		-	-	-	-	16%		**-**

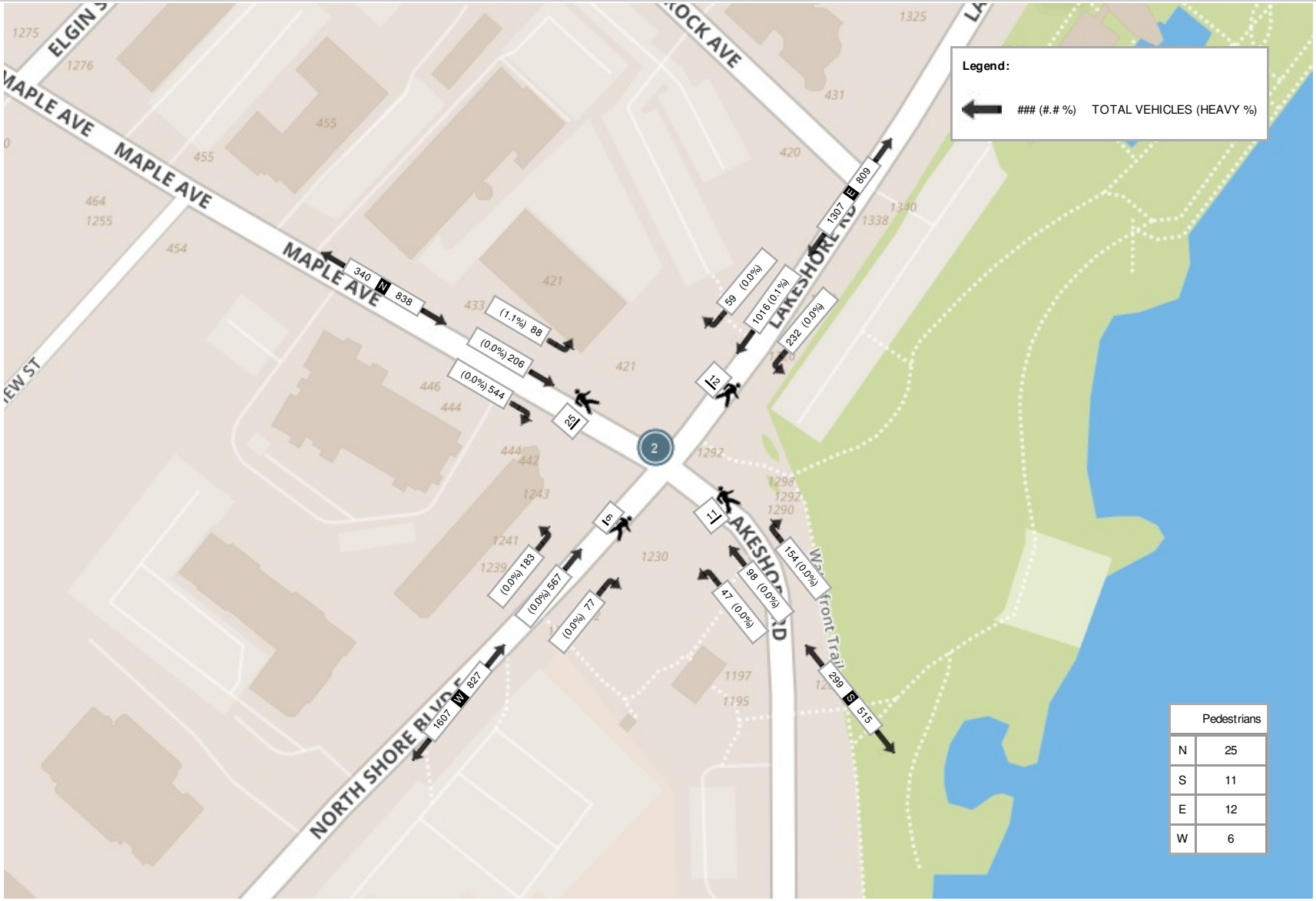
Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast (26.6 °C)

Start Time	N Approach MAPLE AVE						E Approach LAKESHORE RD						S Approach MAPLE AVE						W Approach NORTH SHORE BLVD E						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	115	43	26	0	5	184	20	228	63	0	3	311	55	41	19	0	1	115	23	137	37	0	2	197	807
16:45:00	128	66	24	0	7	218	17	256	53	0	3	326	35	25	11	0	3	71	15	150	53	0	4	218	833
17:00:00	163	57	18	0	11	238	13	270	54	0	6	337	37	20	6	0	5	63	26	130	41	0	0	197	835
17:15:00	138	40	20	0	2	198	9	262	62	0	0	333	27	12	11	0	2	50	13	150	52	0	0	215	796
Grand Total	544	206	88	0	25	838	59	1016	232	0	12	1307	154	98	47	0	11	299	77	567	183	0	6	827	**3271**
Approach%	64.9%	24.6%	10.5%	0%		-	4.5%	77.7%	17.8%	0%		-	51.5%	32.8%	15.7%	0%		-	9.3%	68.6%	22.1%	0%		-	**-**
Totals %	16.6%	6.3%	2.7%	0%		25.6%	1.8%	31.1%	7.1%	0%		40%	4.7%	3%	1.4%	0%		9.1%	2.4%	17.3%	5.6%	0%		25.3%	**-**
PHF	0.83	0.78	0.85	0		0.88	0.74	0.94	0.92	0		0.97	0.7	0.6	0.62	0		0.65	0.74	0.95	0.86	0		0.95	**-**
Heavy	0	0	1	0		1	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Heavy %	0%	0%	1.1%	0%		0.1%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Lights	542	204	84	0		830	53	1002	229	0		1284	147	97	47	0		291	75	564	181	0		820	**-**
Lights %	99.6%	99%	95.5%	0%		99%	89.8%	98.6%	98.7%	0%		98.2%	95.5%	99%	100%	0%		97.3%	97.4%	99.5%	98.9%	0%		99.2%	**-**
Mediums	2	2	3	0		7	6	13	3	0		22	7	1	0	0		8	2	3	2	0		7	**-**
Mediums %	0.4%	1%	3.4%	0%		0.8%	10.2%	1.3%	1.3%	0%		1.7%	4.5%	1%	0%	0%		2.7%	2.6%	0.5%	1.1%	0%		0.8%	**-**
Articulated Trucks	0	0	1	0		1	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	1.1%	0%		0.1%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	25	-	-	-	-	-	12	-	-	-	-	-	11	-	-	-	-	-	6	-	**-**
Pedestrians%	-	-	-	-	46.3%		-	-	-	-	22.2%		-	-	-	-	20.4%		-	-	-	-	11.1%		**-**

Peak Hour: 07:30 AM - 08:30 AM Weather: Unknown (22.8 °C)



Peak Hour: 04:30 PM - 05:30 PM **Weather: Overcast (26.6 °C)**



Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Lakeshore @ Maple	132	1	ACS/3	172.22.38.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		EN
6	2016	11	2	Revert back to original timings	

PHASE DESCRIPTION

Ph1	WBLT- Lakeshore Road	Ph5	EBLT - Lakeshore Road
Ph2	EB - Lakeshore Road	Ph6	WB - Lakeshore Road
Ph3	SBLT - Maple Avenue	Ph7	NBLT - Maple Avenue
Ph4	NB - Maple Avenue	Ph8	SB - Maple Avenue

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

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

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1	Phase: 1	2	3	4	5	6	7	8
Minimum Green	6	8	6	8	6	8	6	8
Walk		12		8		12		8
Ped. Clearance		19		24		19		24
Pedestrian Carry Over								
Vehicle Extension	3	3	3	3	3	3	3	3
MAX 1	12	35	12	25	12	35	12	25
MAX 2	12	35	12	25	12	35	12	25
Yellow Change	3	4	3	4	3	4	3	4
Red Clearance	0	2	0	3	0	2	0	3
Phase Minimum:	10	38	10	40	10	38	10	40

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

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

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

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	110	25	1	1	10	48	10	42	18	40	10	42
2	100	10	1	2	10	38	10	42	10	38	10	42
3	120	110	1	3	15	49	12	44	15	49	12	44
4	100	44	1	4	10	38	10	42	10	38	10	42
10	0	0	1	10	0	0	0	0	0	0	0	0

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

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

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

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

Action Plan 10 = free (254)

Special Programming:

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

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

Lakeshore Road @ Maple Ave

Morning Peak Diagram

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

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

Municipality: Burlington
Site #: 0000201174
Intersection: Lakeshore Road & Maple Ave
TFR File #: 1
Count date: 2-May-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik
Mira

**** Signalized Intersection ****

Major Road: Lakeshore Road runs W/E

North Leg Total:	1005
North Entering:	436
North Peds:	35
Peds Cross:	⋈

Cyclists	0	7	1	8
Trucks	8	3	6	17
Cars	276	92	43	411
Totals	284	102	50	

Cyclists	1
Trucks	46
Cars	522
Totals	569

East Leg Total:	2026
East Entering:	817
East Peds:	61
Peds Cross:	⧖

Maple Ave

Cyclists	Trucks	Cars	Totals
6	29	909	944

Cars	Trucks	Cyclists	Totals
52	7	1	60
608	15	6	629
119	8	1	128
779	30	8	

Lakeshore Road

N
W E
S

Cyclists	Trucks	Cars	Totals
0	23	306	329
5	95	743	843
2	11	92	105
7	129	1141	

Lakeshore Road

Cars	Trucks	Cyclists	Totals
1067	134	8	1209

Maple Ave

Peds Cross:	⧖
West Peds:	15
West Entering:	1277
West Leg Total:	2221

Cars	303
Trucks	22
Cyclists	10
Totals	335

Cars	25	164	281	470
Trucks	6	16	33	55
Cyclists	0	0	2	2
Totals	31	180	316	

Peds Cross:	⋈
South Peds:	35
South Entering:	527
South Leg Total:	862

Comments

Lakeshore Road @ Maple Ave

Mid-day Peak Diagram

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

One Hour Peak
From: 11:15:00
To: 12:15:00

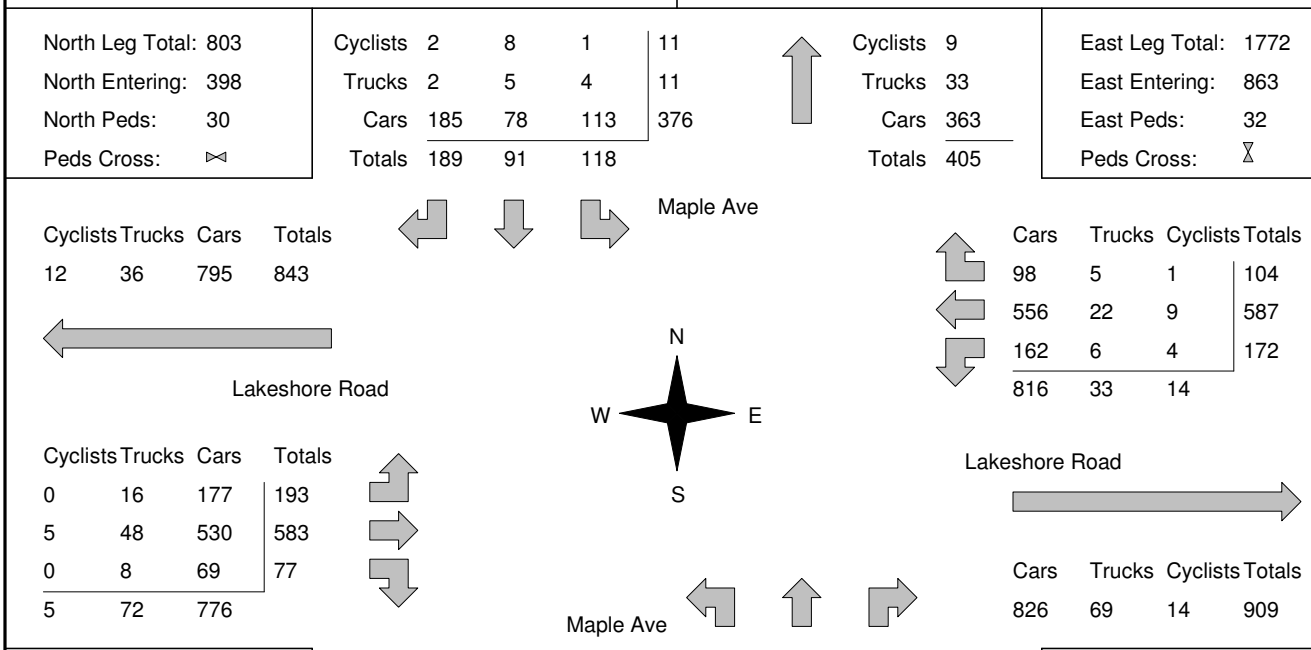
Municipality: Burlington
Site #: 0000201174
Intersection: Lakeshore Road & Maple Ave
TFR File #: 1
Count date: 2-May-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik
Mira

**** Signalized Intersection ****

Major Road: Lakeshore Road runs W/E



Comments

Lakeshore Road @ Maple Ave

Afternoon Peak Diagram

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

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

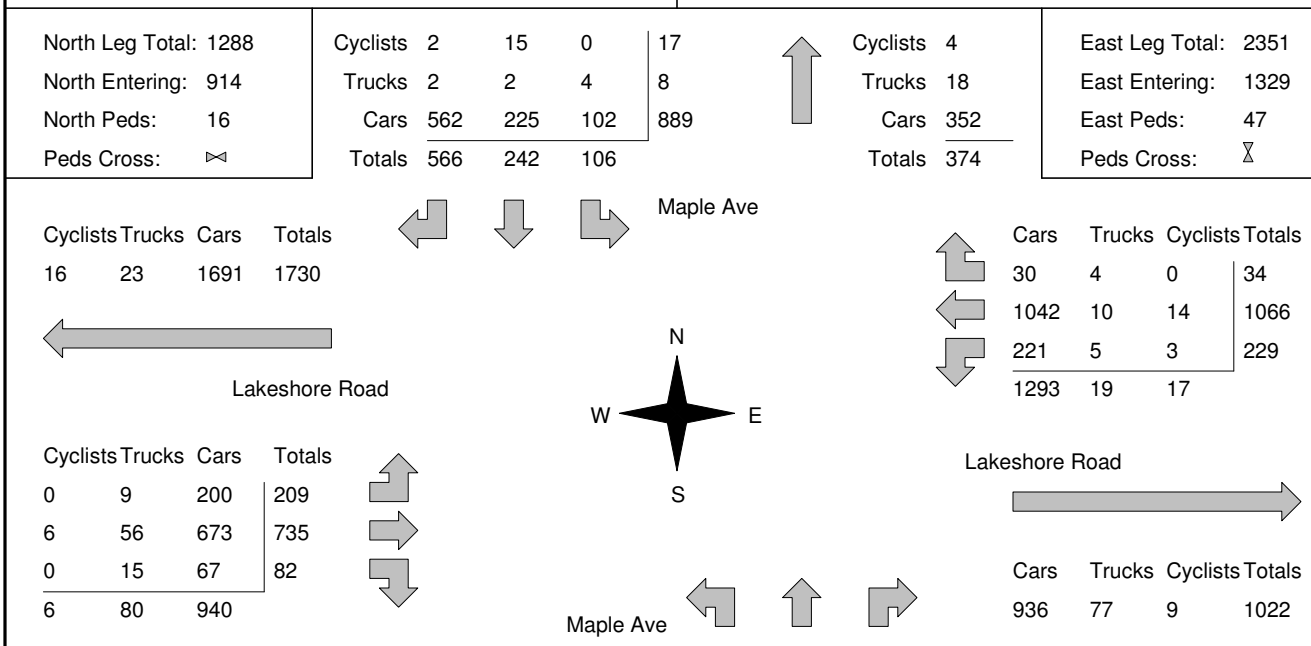
Municipality: Burlington
Site #: 0000201174
Intersection: Lakeshore Road & Maple Ave
TFR File #: 1
Count date: 2-May-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik
Mira

**** Signalized Intersection ****

Major Road: Lakeshore Road runs W/E



Comments

Lakeshore Road @ Maple Ave

Total Count Diagram

Municipality: Burlington
Site #: 0000201174
Intersection: Lakeshore Road & Maple Ave
TFR File #: 1
Count date: 2-May-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik
Mira

**** Signalized Intersection ****

Major Road: Lakeshore Road runs W/E

North Leg Total:	7555			
North Entering:	4246			
North Peds:	208			
Peds Cross:	⋈			
Cyclists	12	73	6	91
Trucks	60	27	38	125
Cars	2392	945	693	4030
Totals	2464	1045	737	
Cyclists	33			
Trucks	241			
Cars	3035			
Totals	3309			
East Leg Total:	15546			
East Entering:	7759			
East Peds:	353			
Peds Cross:	⧖			

Maple Ave

Cyclists	Trucks	Cars	Totals
110	288	8451	8849

Lakeshore Road

Cars	Trucks	Cyclists	Totals
522	39	3	564
5535	147	91	5773
1328	58	36	1422
7385	244	130	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	126	1577	1703
42	504	4657	5203
5	81	543	629
47	711	6777	

Lakeshore Road

Cars	Trucks	Cyclists	Totals
6959	743	85	7787

Maple Ave

Peds Cross:	⧖			
West Peds:	227			
West Entering:	7535			
West Leg Total:	16384			
Cars	2816			
Trucks	166			
Cyclists	114			
Totals	3096			
Cars	524	936	1609	3069
Trucks	81	76	201	358
Cyclists	7	30	37	74
Totals	612	1042	1847	
Peds Cross:	⋈			
South Peds:	276			
South Entering:	3501			
South Leg Total:	6597			

Comments

Lakeshore Road @ Maple Ave
Traffic Count Summary

Intersection: Lakeshore Road & Maple Ave | **Count Date:** 2-May-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	47	86	214	347	21	963
9:00:00	55	102	279	436	41	945
11:00:00	0	0	0	0	0	0
12:00:00	117	87	186	390	28	769
13:00:00	91	110	188	389	22	773
14:00:00	92	102	175	369	22	705
15:00:00	0	0	0	0	0	0
16:00:00	114	130	357	601	31	1026
17:00:00	117	211	519	847	15	1294
18:00:00	104	217	546	867	28	1272
Totals:	737	1045	2464	4246	208	7747

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	25	179	412	616	17
9:00:00	34	175	300	509	44
11:00:00	0	0	0	0	0
12:00:00	66	104	209	379	34
13:00:00	71	107	206	384	34
14:00:00	66	97	173	336	32
15:00:00	0	0	0	0	0
16:00:00	117	139	169	425	50
17:00:00	124	116	207	447	42
18:00:00	109	125	171	405	23
Totals:	612	1042	1847	3501	276

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	98	465	38	601	31	1821
9:00:00	128	635	64	827	68	2074
11:00:00	0	0	0	0	0	0
12:00:00	181	558	93	832	32	1687
13:00:00	165	568	96	829	41	1611
14:00:00	176	599	114	889	53	1615
15:00:00	0	0	0	0	0	0
16:00:00	205	920	86	1211	42	2016
17:00:00	226	980	39	1245	37	2174
18:00:00	243	1048	34	1325	49	2296
Totals:	1422	5773	564	7759	353	15294

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	334	800	86	1220	26
9:00:00	329	825	93	1247	18
11:00:00	0	0	0	0	0
12:00:00	184	584	87	855	27
13:00:00	153	549	80	782	31
14:00:00	155	493	78	726	33
15:00:00	0	0	0	0	0
16:00:00	162	590	53	805	38
17:00:00	188	667	74	929	40
18:00:00	198	695	78	971	14
Totals:	1703	5203	629	7535	227

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:	308	350	346	344	346	450	529	493

LAND USE CATEGORY	Residential			93	
LAND USE	Assisted Living (254)				
INDEPENDENT VARIABLE	Dwelling Units				
TIME PERIOD	Weekday Peak Hour of Adjacent Street Traffic One Hour Between 7 and 9 a.m.				
AVERAGE RATE	0.18				
EQUATION	-				
DIRECTIONAL DISTRIBUTION	IN	24%			
	OUT	76%		IN	OUT
CALCULATED TRIP ENDS	AVERAGE RATE	17		4	13
	FITTED CURVE	-		-	-
MODAL SPLIT	0%	TRIPS	0		
PASS BY	0%	TRIPS	0		
INTERNAL CAPTURE	0%	TRIPS	0	IN	OUT
	NET NEW TRIPS		17	4	13
	Net Trip Rate		0.10		

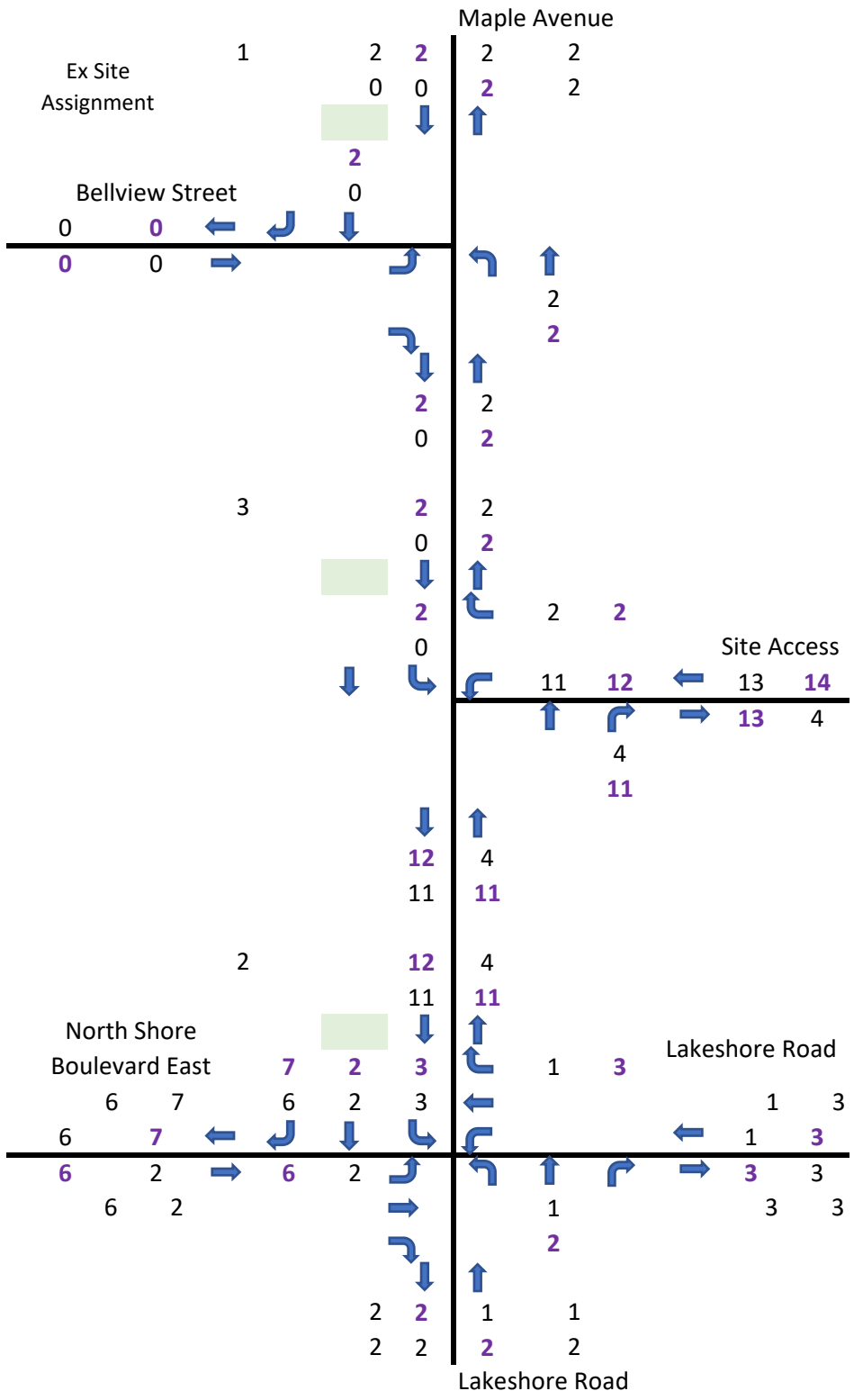
DIRECTION	VIA	IN	OUT	IN	OUT
EAST	Lake Shore Road	20%	25%	1	3
WEST	North Shore Bou	53%	48%	2	6
NORTH	Maple Avenue	10%	15%	0	2
SOUTH	Lake Shore Road	18%	13%	1	2
Total		100%	100%	4	13

CHECK		IN	OUT
		OK	OK
EAST	Lake Shore Road		
WEST	North Shore Boulevard		
NORTH	Maple Avenue		
SOUTH	Lake Shore Road		

LAND USE CATEGORY	Residential			93	
LAND USE	Assisted Living (254)				
INDEPENDENT VARIABLE	Dwelling Units				
TIME PERIOD	Weekday Peak Hour of Adjacent Street Traffic One Hour Between 4 and 6 p.m.				
AVERAGE RATE	0.29				
EQUATION	-				
DIRECTIONAL DISTRIBUTION	IN	50%			
	OUT	50%		IN	OUT
CALCULATED TRIP ENDS	AVERAGE RATE	27		13	14
	FITTED CURVE	-		-	-
MODAL SPLIT	0%	TRIPS	0		
PASS BY	0%	TRIPS	0		
INTERNAL CAPTURE	0%	TRIPS	0	IN	OUT
	NET NEW TRIPS		27	13	14
	Net Trip Rate		0.17		

DIRECTION	VIA	IN	OUT	IN	OUT
EAST	Lake Shore Road	20%	20%	3	3
WEST	North Shore Bou	53%	55%	6	7
NORTH	Maple Avenue	15%	13%	2	2
SOUTH	Lake Shore Road	13%	13%	2	2
Total		100%	100%	13	14

CHECK		IN	OUT
		OK	OK
EAST	Lake Shore Road		
WEST	North Shore Bou	-1	-1
NORTH	Maple Avenue		
SOUTH	Lake Shore Road		


Maple Avenue
Ex Site Assignment
Bellview Street
Site Access
North Shore Boulevard East
Lakeshore Road
Lakeshore Road

APPENDIX C

Levels of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare.
B	> 10 and ≤ 15	VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal.
C	> 15 and ≤ 25	GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable.
D	> 25 and ≤ 35	FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street.
E	> 35 and ≤ 50	POOR. Very infrequent gaps in traffic on the main roadway. Queue lengths become noticeable.
F	> 50	UNSATISFACTORY. Very few gaps in traffic on the main roadway. Excessive delay with significant queue lengths on the minor street.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

Level of Service Definitions

Signalized Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Extremely favourable progression with most vehicles arriving during the green phase. Most vehicles do not stop and short cycle lengths may contribute to low delay.
B	> 10 and ≤ 20	VERY GOOD. Very good progression and/or short cycle lengths with slightly more vehicles stopping than LOS "A" causing slightly higher levels of average delay.
C	> 20 and ≤ 35	GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B".
D	> 35 and ≤ 55	FAIR. Congestion becomes noticeable with higher average delays resulting from a combination of long cycle lengths, high volume-to-capacity ratios and unfavourable progression.
E	> 55 and ≤ 80	POOR. Lengthy delays values are indicative of poor progression, long cycle lengths and high volume-to-capacity ratios. Individual cycle failures are common with individual movement failures also common.
F	> 80	UNSATISFACTORY. Indicative of oversaturated conditions with vehicular demand greater than the capacity of the intersection.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

APPENDIX D

Detailed Capacity Analyses

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	23	15	554	466	5
Future Vol, veh/h	23	23	15	554	466	5
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	24	24	16	583	491	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	826	257	504	0	-	0
Stage 1	502	-	-	-	-	-
Stage 2	324	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	314	748	1071	-	-	-
Stage 1	579	-	-	-	-	-
Stage 2	711	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	304	741	1063	-	-	-
Mov Cap-2 Maneuver	304	-	-	-	-	-
Stage 1	566	-	-	-	-	-
Stage 2	705	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1063	-	431	-	-
HCM Lane V/C Ratio	0.015	-	0.112	-	-
HCM Control Delay (s)	8.4	-	14.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

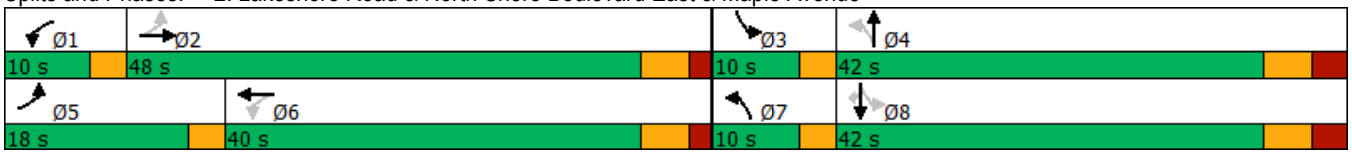
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	342	877	109	133	654	62	32	187	329	52	106	295
Future Volume (vph)	342	877	109	133	654	62	32	187	329	52	106	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	27.0		0.0	25.0		0.0	60.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	1.00		0.99	0.95		0.98		0.97
Frt		0.983			0.987			0.904				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3556	0	1825	3587	0	1825	1655	0	1825	1921	1633
Flt Permitted	0.188			0.155			0.686			0.119		
Satd. Flow (perm)	358	3556	0	294	3587	0	1300	1655	0	224	1921	1589
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			9			84				307
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		140.4			120.6			116.3			95.2	
Travel Time (s)		8.4			7.2			7.0			6.9	
Confl. Peds. (#/hr)	35		35	35		35	15		61	61		15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	356	914	114	139	681	65	33	195	343	54	110	307
Shared Lane Traffic (%)												
Lane Group Flow (vph)	356	1028	0	139	746	0	33	538	0	54	110	307
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	10.0	38.0		10.0	38.0		10.0	40.0		10.0	40.0	40.0
Total Split (s)	18.0	48.0		10.0	40.0		10.0	42.0		10.0	42.0	42.0
Total Split (%)	16.4%	43.6%		9.1%	36.4%		9.1%	38.2%		9.1%	38.2%	38.2%
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Max		None	Max		None	None		Max	None	None
Act Effct Green (s)	55.1	42.0		44.0	34.0		43.9	33.3		45.6	37.5	37.5
Actuated g/C Ratio	0.51	0.39		0.41	0.31		0.40	0.31		0.42	0.35	0.35
v/c Ratio	0.92	0.74		0.64	0.66		0.06	0.95		0.27	0.17	0.41
Control Delay	51.3	32.4		30.6	35.4		17.7	59.0		21.1	26.8	5.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	51.3	32.4		30.6	35.4		17.7	59.0		21.1	26.8	5.0
LOS	D	C		C	D		B	E		C	C	A
Approach Delay		37.2			34.7			56.6			11.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			C			E			B	
Queue Length 50th (m)	45.8	98.1		15.6	72.3		3.9	96.4		6.5	16.9	0.0
Queue Length 95th (m)	#101.2	122.8		#29.6	92.8		9.5	#161.3		13.7	30.4	18.6
Internal Link Dist (m)		116.4			96.6			92.3			71.2	
Turn Bay Length (m)	27.0			25.0			60.0			45.0		
Base Capacity (vph)	385	1387		218	1131		566	591		197	664	750
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.92	0.74		0.64	0.66		0.06	0.91		0.27	0.17	0.41

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 108.4
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 36.3 Intersection LOS: D
Intersection Capacity Utilization 100.2% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	576	4	0	482
Future Volume (Veh/h)	0	0	576	4	0	482
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	626	4	0	524
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)			95			
pX, platoon unblocked						
vC, conflicting volume	890	315			630	
vC1, stage 1 conf vol	628					
vC2, stage 2 conf vol	262					
vCu, unblocked vol	890	315			630	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	457	681			948	

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	417	213	0	262	262
Volume Left	0	0	0	0	0
Volume Right	0	4	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.25	0.13	0.00	0.15	0.15
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	2	576	0	0	471
Future Vol, veh/h	11	2	576	0	0	471
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	2	626	0	0	512

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	882	313	0	-	-	-
Stage 1	626	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	286	683	-	0	0	-
Stage 1	495	-	-	0	0	-
Stage 2	763	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	286	683	-	-	-	-
Mov Cap-2 Maneuver	394	-	-	-	-	-
Stage 1	495	-	-	-	-	-
Stage 2	763	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	421	-
HCM Lane V/C Ratio	-	0.034	-
HCM Control Delay (s)	-	13.8	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	16	14	413	934	22
Future Vol, veh/h	16	16	14	413	934	22
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	17	17	15	444	1004	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1276	523	1036	0	-	0
Stage 1	1024	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	161	504	679	-	-	-
Stage 1	312	-	-	-	-	-
Stage 2	773	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	155	500	674	-	-	-
Mov Cap-2 Maneuver	155	-	-	-	-	-
Stage 1	303	-	-	-	-	-
Stage 2	767	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.8	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	674	-	237	-	-
HCM Lane V/C Ratio	0.022	-	0.145	-	-
HCM Control Delay (s)	10.5	-	22.8	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

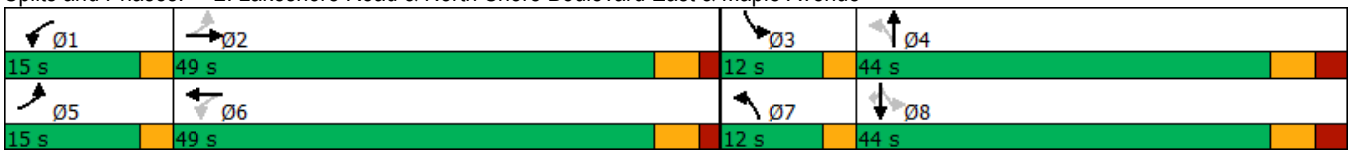
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	764	85	238	1109	35	102	136	188	110	106	295
Future Volume (vph)	217	764	85	238	1109	35	102	136	188	110	106	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	27.0		0.0	25.0		0.0	60.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.99	1.00		0.99	0.95		0.97		0.97
Frt		0.985			0.995			0.913				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3564	0	1825	3626	0	1825	1673	0	1825	1921	1633
Flt Permitted	0.092			0.186			0.683			0.253		
Satd. Flow (perm)	177	3564	0	353	3626	0	1293	1673	0	470	1921	1586
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			3			60				308
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		140.4			120.6			116.3			95.2	
Travel Time (s)		8.4			7.2			7.0			6.9	
Confl. Peds. (#/hr)	35		35	35		35	15		61	61		15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	236	830	92	259	1205	38	111	148	204	120	115	321
Shared Lane Traffic (%)												
Lane Group Flow (vph)	236	922	0	259	1243	0	111	352	0	120	115	321
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	10.0	38.0		10.0	38.0		10.0	40.0		10.0	40.0	40.0
Total Split (s)	15.0	49.0		15.0	49.0		12.0	44.0		12.0	44.0	44.0
Total Split (%)	12.5%	40.8%		12.5%	40.8%		10.0%	36.7%		10.0%	36.7%	36.7%
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Max		None	Max		None	None		None	None	None
Act Effct Green (s)	58.6	43.5		58.1	43.2		36.9	24.4		37.1	24.5	24.5
Actuated g/C Ratio	0.55	0.41		0.54	0.40		0.34	0.23		0.35	0.23	0.23
v/c Ratio	0.84	0.64		0.74	0.85		0.23	0.83		0.44	0.26	0.54
Control Delay	50.9	29.0		27.9	37.1		23.0	48.9		27.3	34.8	7.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	50.9	29.0		27.9	37.1		23.0	48.9		27.3	34.8	7.9
LOS	D	C		C	D		C	D		C	C	A
Approach Delay		33.5			35.5			42.7			17.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			D			D			B	
Queue Length 50th (m)	31.4	79.4		25.7	122.2		15.2	59.2		16.6	19.9	2.1
Queue Length 95th (m)	#86.3	118.5		#65.4	#191.5		26.5	91.7		28.5	34.5	23.1
Internal Link Dist (m)		116.4			96.6			92.3			71.2	
Turn Bay Length (m)	27.0			25.0			60.0			45.0		
Base Capacity (vph)	281	1449		357	1461		495	618		278	665	750
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.84	0.64		0.73	0.85		0.22	0.57		0.43	0.17	0.43

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 107.4			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 33.1		Intersection LOS: C	
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			

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

Splits and Phases: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	397	11	2	961
Future Volume (Veh/h)	0	0	397	11	2	961
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	432	12	2	1045
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)			95			
pX, platoon unblocked						
vC, conflicting volume	964	222			444	
vC1, stage 1 conf vol	438					
vC2, stage 2 conf vol	526					
vCu, unblocked vol	964	222			444	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	462	782			1112	

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	288	156	2	522	522
Volume Left	0	0	2	0	0
Volume Right	0	12	0	0	0
cSH	1700	1700	1112	1700	1700
Volume to Capacity	0.17	0.09	0.00	0.31	0.31
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	8.2	0.0	0.0
Lane LOS			A		
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	2	397	0	0	951
Future Vol, veh/h	12	2	397	0	0	951
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	2	432	0	0	1034

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	949	216	0	-	-	-
Stage 1	432	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	259	789	-	0	0	-
Stage 1	622	-	-	0	0	-
Stage 2	563	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	259	789	-	-	-	-
Mov Cap-2 Maneuver	388	-	-	-	-	-
Stage 1	622	-	-	-	-	-
Stage 2	563	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	418	-
HCM Lane V/C Ratio	-	0.036	-
HCM Control Delay (s)	-	13.9	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	23	15	615	520	5
Future Vol, veh/h	23	23	15	615	520	5
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	24	24	16	647	547	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	914	285	560	0	-	0
Stage 1	558	-	-	-	-	-
Stage 2	356	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	276	718	1021	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	686	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	267	712	1013	-	-	-
Mov Cap-2 Maneuver	267	-	-	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	681	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.6	0.2	0
HCM LOS	C		

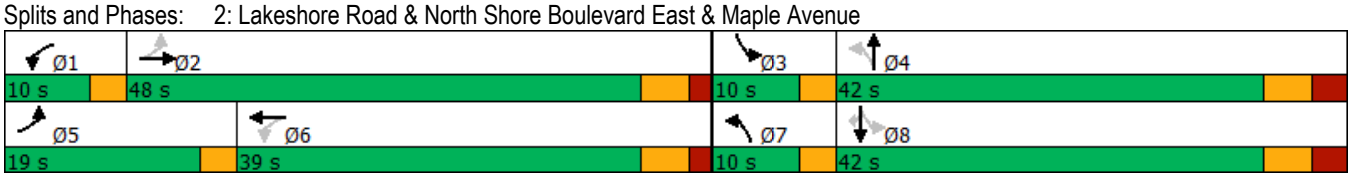
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1013	-	388	-	-
HCM Lane V/C Ratio	0.016	-	0.125	-	-
HCM Control Delay (s)	8.6	-	15.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	342	965	109	133	721	62	32	206	329	52	117	295
Future Volume (vph)	342	965	109	133	721	62	32	206	329	52	117	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	27.0		0.0	25.0		0.0	60.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	1.00		0.99	0.95		0.98		0.97
Frt		0.985			0.988			0.908				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3566	0	1825	3592	0	1825	1665	0	1825	1921	1633
Flt Permitted	0.141			0.121			0.679			0.104		
Satd. Flow (perm)	269	3566	0	230	3592	0	1287	1665	0	196	1921	1589
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			8			77				307
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		140.4			120.6			116.3			95.2	
Travel Time (s)		8.4			7.2			7.0			6.9	
Confl. Peds. (#/hr)	35		35	35		35	15		61	61		15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	356	1005	114	139	751	65	33	215	343	54	122	307
Shared Lane Traffic (%)												
Lane Group Flow (vph)	356	1119	0	139	816	0	33	558	0	54	122	307
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)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
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		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	10.0	38.0		10.0	38.0		10.0	40.0		10.0	40.0	40.0
Total Split (s)	19.0	48.0		10.0	39.0		10.0	42.0		10.0	42.0	42.0
Total Split (%)	17.3%	43.6%		9.1%	35.5%		9.1%	38.2%		9.1%	38.2%	38.2%
Maximum Green (s)	16.0	42.0		7.0	33.0		7.0	35.0		7.0	35.0	35.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max		None	Max		None	None		Max	None	None
Walk Time (s)		12.0			12.0			8.0			8.0	8.0
Flash Dont Walk (s)		19.0			19.0			24.0			24.0	24.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	55.0	42.0		43.0	33.0		44.8	34.3		46.6	38.4	38.4
Actuated g/C Ratio	0.50	0.38		0.39	0.30		0.41	0.31		0.43	0.35	0.35
v/c Ratio	0.98	0.81		0.72	0.75		0.06	0.97		0.29	0.18	0.41
Control Delay	69.5	35.6		41.0	39.3		17.7	63.8		21.6	26.9	4.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	69.5	35.6		41.0	39.3		17.7	63.8		21.6	26.9	4.9
LOS	E	D		D	D		B	E		C	C	A
Approach Delay		43.8			39.5			61.2			12.3	
Approach LOS		D			D			E			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 109.3			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 41.2		Intersection LOS: D	
Intersection Capacity Utilization 101.1%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	639	4	0	536
Future Volume (Veh/h)	0	0	639	4	0	536
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	695	4	0	583
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)			95			
pX, platoon unblocked						
vC, conflicting volume	988	350			699	
vC1, stage 1 conf vol	697					
vC2, stage 2 conf vol	292					
vCu, unblocked vol	988	350			699	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	421	647			893	

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	463	236	0	292	292
Volume Left	0	0	0	0	0
Volume Right	0	4	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.27	0.14	0.00	0.17	0.17
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	2	639	0	0	525
Future Vol, veh/h	11	2	639	0	0	525
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	2	695	0	0	571

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	981	348	0	-	-	-
Stage 1	695	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	247	648	-	0	0	-
Stage 1	456	-	-	0	0	-
Stage 2	737	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	247	648	-	-	-	-
Mov Cap-2 Maneuver	359	-	-	-	-	-
Stage 1	456	-	-	-	-	-
Stage 2	737	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	385	-
HCM Lane V/C Ratio	-	0.037	-
HCM Control Delay (s)	-	14.7	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	16	14	459	1036	22
Future Vol, veh/h	16	16	14	459	1036	22
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	17	17	15	494	1114	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1411	578	1146	0	-	0
Stage 1	1134	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	132	464	617	-	-	-
Stage 1	273	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	127	460	612	-	-	-
Mov Cap-2 Maneuver	127	-	-	-	-	-
Stage 1	264	-	-	-	-	-
Stage 2	745	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.8	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	612	-	199	-	-
HCM Lane V/C Ratio	0.025	-	0.173	-	-
HCM Control Delay (s)	11	-	26.8	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

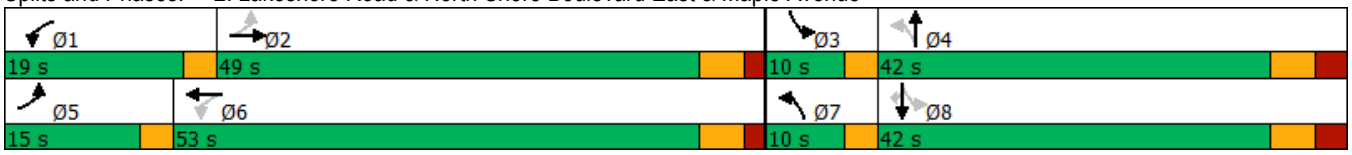
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	840	85	238	1221	35	102	150	188	110	277	598
Future Volume (vph)	222	840	85	238	1221	35	102	150	188	110	277	598
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	27.0		0.0	25.0		0.0	60.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.99	1.00		0.99	0.96		0.97		0.97
Frt		0.986			0.996			0.917				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3571	0	1825	3630	0	1825	1684	0	1825	1921	1633
Flt Permitted	0.090			0.114			0.411			0.314		
Satd. Flow (perm)	173	3571	0	217	3630	0	782	1684	0	584	1921	1586
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			3			53				272
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		140.4			120.6			116.3			95.2	
Travel Time (s)		8.4			7.2			7.0			6.9	
Confl. Peds. (#/hr)	35		35	35		35	15		61	61		15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	241	913	92	259	1327	38	111	163	204	120	301	650
Shared Lane Traffic (%)												
Lane Group Flow (vph)	241	1005	0	259	1365	0	111	367	0	120	301	650
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	10.0	38.0		10.0	38.0		10.0	40.0		10.0	40.0	40.0
Total Split (s)	15.0	49.0		19.0	53.0		10.0	42.0		10.0	42.0	42.0
Total Split (%)	12.5%	40.8%		15.8%	44.2%		8.3%	35.0%		8.3%	35.0%	35.0%
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Max		None	Max		None	None		None	None	None
Act Effct Green (s)	59.3	44.3		64.1	47.0		46.0	35.0		46.0	35.0	35.0
Actuated g/C Ratio	0.49	0.37		0.53	0.39		0.38	0.29		0.38	0.29	0.29
v/c Ratio	0.96	0.76		0.83	0.96		0.31	0.70		0.41	0.54	0.99
Control Delay	79.7	37.6		45.2	51.8		25.0	40.1		27.2	40.0	58.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	79.7	37.6		45.2	51.8		25.0	40.1		27.2	40.0	58.6
LOS	E	D		D	D		C	D		C	D	E
Approach Delay		45.8			50.7			36.6			49.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			D			D			D	
Queue Length 50th (m)	40.5	109.2		36.3	162.4		16.2	66.1		17.6	59.5	101.1
Queue Length 95th (m)	#91.1	134.6		#74.9	#210.7		28.3	100.6		30.3	87.3	#179.9
Internal Link Dist (m)		116.4			96.6			92.3			71.2	
Turn Bay Length (m)	27.0			25.0			60.0			45.0		
Base Capacity (vph)	250	1324		331	1423		360	528		296	560	655
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.96	0.76		0.78	0.96		0.31	0.70		0.41	0.54	0.99

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 47.6 Intersection LOS: D
Intersection Capacity Utilization 96.9% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	442	11	2	1065
Future Volume (Veh/h)	0	0	442	11	2	1065
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	480	12	2	1158
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)			95			
pX, platoon unblocked						
vC, conflicting volume	1069	246			492	
vC1, stage 1 conf vol	486					
vC2, stage 2 conf vol	583					
vCu, unblocked vol	1069	246			492	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	427	754			1068	

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	320	172	2	579	579
Volume Left	0	0	2	0	0
Volume Right	0	12	0	0	0
cSH	1700	1700	1068	1700	1700
Volume to Capacity	0.19	0.10	0.00	0.34	0.34
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	8.4	0.0	0.0
Lane LOS			A		
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	2	442	0	0	1055
Future Vol, veh/h	12	2	442	0	0	1055
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	2	480	0	0	1147

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1054	240	0	-	-	-
Stage 1	480	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	221	761	-	0	0	-
Stage 1	588	-	-	0	0	-
Stage 2	527	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	221	761	-	-	-	-
Mov Cap-2 Maneuver	354	-	-	-	-	-
Stage 1	588	-	-	-	-	-
Stage 2	527	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	383	-
HCM Lane V/C Ratio	-	0.04	-
HCM Control Delay (s)	-	14.8	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	25	15	617	521	5
Future Vol, veh/h	25	25	15	617	521	5
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	26	26	16	649	548	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	916	286	561	0	-	0
Stage 1	559	-	-	-	-	-
Stage 2	357	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	275	717	1020	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	685	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	266	711	1012	-	-	-
Mov Cap-2 Maneuver	266	-	-	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	680	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1012	-	387	-	-
HCM Lane V/C Ratio	0.016	-	0.136	-	-
HCM Control Delay (s)	8.6	-	15.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

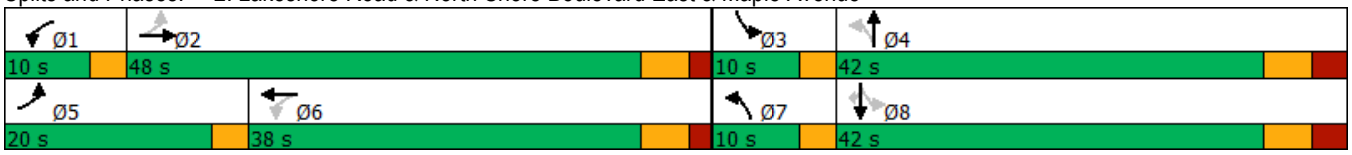
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	350	965	109	133	721	63	32	207	329	57	119	312
Future Volume (vph)	350	965	109	133	721	63	32	207	329	57	119	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	27.0		0.0	25.0		0.0	60.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	1.00		0.99	0.95		0.98		0.97
Frt		0.985			0.988			0.908				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3566	0	1825	3592	0	1825	1666	0	1825	1921	1633
Flt Permitted	0.131			0.125			0.677			0.104		
Satd. Flow (perm)	250	3566	0	238	3592	0	1284	1666	0	196	1921	1589
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			8			76				325
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		140.4			120.6			116.3			102.0	
Travel Time (s)		8.4			7.2			7.0			7.3	
Confl. Peds. (#/hr)	35		35	35		35	15		61	61		15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	365	1005	114	139	751	66	33	216	343	59	124	325
Shared Lane Traffic (%)												
Lane Group Flow (vph)	365	1119	0	139	817	0	33	559	0	59	124	325
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	10.0	38.0		10.0	38.0		10.0	40.0		10.0	40.0	40.0
Total Split (s)	20.0	48.0		10.0	38.0		10.0	42.0		10.0	42.0	42.0
Total Split (%)	18.2%	43.6%		9.1%	34.5%		9.1%	38.2%		9.1%	38.2%	38.2%
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Max		None	Max		None	None		Max	None	None
Act Effct Green (s)	55.0	42.0		42.0	32.0		44.9	34.4		46.7	38.5	38.5
Actuated g/C Ratio	0.50	0.38		0.38	0.29		0.41	0.31		0.43	0.35	0.35
v/c Ratio	0.99	0.81		0.72	0.77		0.06	0.97		0.32	0.18	0.42
Control Delay	71.5	35.7		41.1	41.0		17.7	64.2		22.2	26.9	4.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	71.5	35.7		41.1	41.0		17.7	64.2		22.2	26.9	4.9
LOS	E	D		D	D		B	E		C	C	A
Approach Delay		44.5			41.1			61.6			12.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			D			E			B	
Queue Length 50th (m)	58.8	111.0		15.6	83.7		3.9	104.5		7.1	19.2	0.0
Queue Length 95th (m)	#118.4	137.7		#39.7	106.5		9.5	#173.5		14.7	33.7	19.1
Internal Link Dist (m)		116.4			96.6			92.3			78.0	
Turn Bay Length (m)	27.0			25.0			60.0			45.0		
Base Capacity (vph)	370	1377		192	1056		567	584		187	675	769
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.99	0.81		0.72	0.77		0.06	0.96		0.32	0.18	0.42

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 109.4
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 41.8 Intersection LOS: D
Intersection Capacity Utilization 101.6% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue



Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	28	5	639	9	5	525
Future Vol, veh/h	28	5	639	9	5	525
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	5	695	10	5	571

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	996	353	0	0	705	0
Stage 1	700	-	-	-	-	-
Stage 2	296	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	241	643	-	-	889	-
Stage 1	454	-	-	-	-	-
Stage 2	729	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	240	643	-	-	889	-
Mov Cap-2 Maneuver	353	-	-	-	-	-
Stage 1	451	-	-	-	-	-
Stage 2	729	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.5	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	379	889	-
HCM Lane V/C Ratio	-	-	0.095	0.006	-
HCM Control Delay (s)	-	-	15.5	9.1	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	18	14	459	1039	22
Future Vol, veh/h	18	18	14	459	1039	22
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	19	19	15	494	1117	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1410	575	1145	0	-	0
Stage 1	1133	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	132	466	618	-	-	-
Stage 1	273	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	128	464	616	-	-	-
Mov Cap-2 Maneuver	128	-	-	-	-	-
Stage 1	265	-	-	-	-	-
Stage 2	748	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.1	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	616	-	201	-	-
HCM Lane V/C Ratio	0.024	-	0.193	-	-
HCM Control Delay (s)	11	-	27.1	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

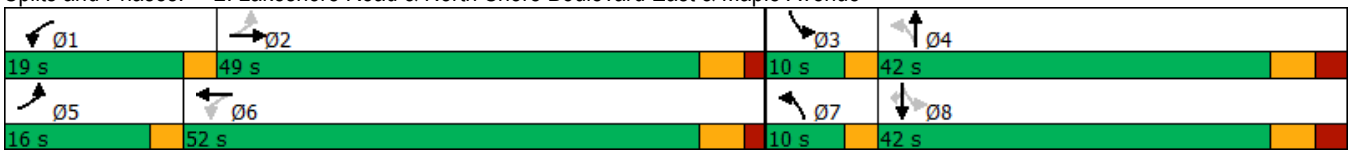
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	840	85	238	1221	38	102	152	188	111	277	602
Future Volume (vph)	232	840	85	238	1221	38	102	152	188	111	277	602
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	27.0		0.0	25.0		0.0	60.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	24.0			15.0			60.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		1.00	0.99		0.99		0.98
Frt		0.986			0.996			0.917				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3586	0	1825	3631	0	1825	1737	0	1825	1921	1633
Flt Permitted	0.090			0.117			0.409			0.309		
Satd. Flow (perm)	173	3586	0	224	3631	0	783	1737	0	590	1921	1603
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			3			52				289
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		140.4			120.6			116.3			101.5	
Travel Time (s)		8.4			7.2			7.0			7.3	
Confl. Peds. (#/hr)	25		11	11		25	6		12	12		6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	252	913	92	259	1327	41	111	165	204	121	301	654
Shared Lane Traffic (%)												
Lane Group Flow (vph)	252	1005	0	259	1368	0	111	369	0	121	301	654
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	10.0	38.0		10.0	38.0		10.0	40.0		10.0	40.0	40.0
Total Split (s)	16.0	49.0		19.0	52.0		10.0	42.0		10.0	42.0	42.0
Total Split (%)	13.3%	40.8%		15.8%	43.3%		8.3%	35.0%		8.3%	35.0%	35.0%
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Max		None	Max		None	None		None	None	None
Act Effct Green (s)	60.4	44.3		63.7	46.0		45.7	34.7		45.7	34.7	34.7
Actuated g/C Ratio	0.50	0.37		0.53	0.38		0.38	0.29		0.38	0.29	0.29
v/c Ratio	0.94	0.75		0.82	0.98		0.31	0.68		0.41	0.54	0.98
Control Delay	74.1	37.3		43.8	56.3		25.1	39.5		27.2	40.1	53.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	74.1	37.3		43.8	56.3		25.1	39.5		27.2	40.1	53.7
LOS	E	D		D	E		C	D		C	D	D
Approach Delay		44.7			54.3			36.2			46.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			D			D			D	
Queue Length 50th (m)	42.8	108.9		35.4	165.5		16.2	66.3		17.8	59.5	96.6
Queue Length 95th (m)	#93.7	134.4		#73.4	#215.4		28.3	100.2		30.5	87.3	#174.5
Internal Link Dist (m)		116.4			96.6			92.3			77.5	
Turn Bay Length (m)	27.0			25.0			60.0			45.0		
Base Capacity (vph)	267	1334		335	1397		359	544		297	562	673
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.94	0.75		0.77	0.98		0.31	0.68		0.41	0.54	0.97

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 119.7
Natural Cycle: 110
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 47.8 Intersection LOS: D
Intersection Capacity Utilization 93.9% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue



Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	17	2	442	26	5	1053
Future Vol, veh/h	17	2	442	26	5	1053
Conflicting Peds, #/hr	17	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	2	480	28	5	1145

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1094	254	0	0	508	0
Stage 1	494	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	208	745	-	-	1053	-
Stage 1	579	-	-	-	-	-
Stage 2	511	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	204	745	-	-	1053	-
Mov Cap-2 Maneuver	336	-	-	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	503	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	357	1053	-
HCM Lane V/C Ratio	-	-	0.058	0.005	-
HCM Control Delay (s)	-	-	15.7	8.4	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection: 1: Maple Avenue & Bellview Street

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (m)	13.0	9.1	3.9
Average Queue (m)	6.2	1.5	0.3
95th Queue (m)	13.4	7.0	3.6
Link Distance (m)	178.6		147.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		15.0	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (m)	50.9	104.6	95.4	39.8	115.5	115.5	36.9	96.1	51.5	74.2	81.6
Average Queue (m)	39.1	64.5	59.3	32.2	105.5	96.5	19.6	46.6	15.7	42.8	66.2
95th Queue (m)	61.1	103.7	93.2	46.2	130.0	126.0	34.6	84.3	37.3	72.4	93.7
Link Distance (m)		126.0	126.0		110.9	110.9		104.3		77.2	77.2
Upstream Blk Time (%)		0			12	6		0	0	0	6
Queuing Penalty (veh)		0			0	0		0	0	1	33
Storage Bay Dist (m)	27.0			25.0			60.0		45.0		
Storage Blk Time (%)	26	26		20	44			7		9	
Queuing Penalty (veh)	109	61		124	105			7		10	

Intersection: 3: Maple Avenue & Site Access

Movement	WB	NB	NB	SB	SB	SB
Directions Served	LR	T	TR	L	T	T
Maximum Queue (m)	8.8	10.5	13.7	4.6	23.4	56.0
Average Queue (m)	3.4	1.4	1.3	0.6	3.6	13.7
95th Queue (m)	9.7	7.1	9.4	4.3	16.3	45.9
Link Distance (m)	37.0	77.2	77.2		71.6	71.6
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (m)				10.0		
Storage Blk Time (%)				0	1	
Queuing Penalty (veh)				1	0	

Network Summary

Network wide Queuing Penalty: 452

Intersection: 1: Maple Avenue & Bellview Street

Movement	EB	NB	NB	NB
Directions Served	LR	L	T	T
Maximum Queue (m)	11.6	10.5	2.3	3.8
Average Queue (m)	6.7	1.9	0.2	0.3
95th Queue (m)	12.7	8.2	2.1	3.4
Link Distance (m)	175.3		48.0	48.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		15.0		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (m)	34.4	127.6	125.5	32.3	112.2	94.9	67.4	105.7	19.6	27.1	55.5
Average Queue (m)	34.3	124.7	110.1	27.7	89.7	72.1	31.7	105.7	8.3	13.5	31.4
95th Queue (m)	34.6	142.3	144.3	39.7	123.2	109.1	83.3	105.7	19.2	26.3	50.5
Link Distance (m)		123.0	123.0		107.6	107.6		101.1		69.4	69.4
Upstream Blk Time (%)		56	13		8	2		84			
Queuing Penalty (veh)		0	0		0	0		0			
Storage Bay Dist (m)	27.0			25.0			60.0		45.0		
Storage Blk Time (%)	73	16		29	46			83			
Queuing Penalty (veh)	320	53		96	61			26			

Intersection: 8: Maple Avenue & Site Access In Only

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 10: Maple Avenue & Site Access Out Only

Movement	WB
Directions Served	LR
Maximum Queue (m)	10.6
Average Queue (m)	2.9
95th Queue (m)	9.8
Link Distance (m)	54.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 557

Intersection: 1: Maple Avenue & Bellview Street

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	12.9	9.1
Average Queue (m)	5.7	2.3
95th Queue (m)	13.4	8.6
Link Distance (m)	175.3	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		15.0
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (m)	34.4	127.4	120.6	32.3	112.2	112.2	67.3	101.3	38.8	48.7	68.0
Average Queue (m)	33.2	105.6	84.5	31.0	112.2	111.7	25.9	59.0	15.4	17.2	39.5
95th Queue (m)	38.8	144.9	127.9	36.2	112.2	114.8	60.7	99.6	32.4	38.2	62.9
Link Distance (m)		123.0	123.0		107.6	107.6		101.1		69.4	69.4
Upstream Blk Time (%)		14	2		75	49		2		0	1
Queuing Penalty (veh)		0	0		0	0		0		1	2
Storage Bay Dist (m)	27.0			25.0			60.0		45.0		
Storage Blk Time (%)	61	21		49	40			14	1	0	
Queuing Penalty (veh)	231	46		274	96			15	1	0	

Intersection: 8: Maple Avenue & Site Access In Only

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (m)	2.3	8.6	2.6
Average Queue (m)	0.3	0.7	0.2
95th Queue (m)	3.1	6.6	2.4
Link Distance (m)		10.4	10.4
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	0	1	1
Storage Bay Dist (m)	10.0		
Storage Blk Time (%)	0	0	
Queuing Penalty (veh)	1	0	

Intersection: 10: Maple Avenue & Site Access Out Only

Movement	WB	SB	SB
Directions Served	LR	T	T
Maximum Queue (m)	8.9	6.1	3.8
Average Queue (m)	4.1	0.4	0.3
95th Queue (m)	11.3	4.1	3.5
Link Distance (m)	54.2	48.0	48.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 669

Intersection: 1: Maple Avenue & Bellview Street

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	16.0	9.0
Average Queue (m)	7.1	1.9
95th Queue (m)	14.3	7.8
Link Distance (m)	175.3	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		15.0
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (m)	34.4	127.6	127.6	32.3	112.2	112.1	67.4	105.7	25.7	41.2	44.4
Average Queue (m)	34.3	126.9	120.6	28.6	100.5	89.2	26.7	105.6	9.2	16.6	26.9
95th Queue (m)	35.1	131.9	142.1	39.6	128.0	129.0	77.5	107.0	20.2	34.4	44.0
Link Distance (m)		123.0	123.0		107.6	107.6		101.1		69.4	69.4
Upstream Blk Time (%)		70	18		35	13		83			
Queuing Penalty (veh)		0	0		0	0		0			
Storage Bay Dist (m)	27.0			25.0			60.0		45.0		
Storage Blk Time (%)	73	18		49	35		0	82		0	
Queuing Penalty (veh)	351	60		177	47		0	26		0	

Intersection: 8: Maple Avenue & Site Access In Only

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 10: Maple Avenue & Site Access Out Only

Movement	WB
Directions Served	LR
Maximum Queue (m)	12.2
Average Queue (m)	3.4
95th Queue (m)	11.2
Link Distance (m)	54.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 661

Intersection: 1: Maple Avenue & Bellview Street

Movement	EB	NB	SB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	37.1	10.4	120.1	131.2
Average Queue (m)	16.2	2.6	52.1	69.3
95th Queue (m)	46.3	9.1	149.5	163.3
Link Distance (m)	175.3		144.1	144.1
Upstream Blk Time (%)			14	15
Queuing Penalty (veh)			0	0
Storage Bay Dist (m)		15.0		
Storage Blk Time (%)		1		
Queuing Penalty (veh)		2		

Intersection: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (m)	34.4	127.6	127.6	32.3	112.2	112.2	67.5	100.4	52.4	72.6	73.7
Average Queue (m)	34.1	111.2	93.8	31.2	112.1	111.0	31.8	74.5	23.7	49.1	62.2
95th Queue (m)	35.8	150.1	139.4	36.1	112.5	120.4	72.3	124.1	54.3	90.6	102.7
Link Distance (m)		123.0	123.0		107.6	107.6		101.1		69.4	69.4
Upstream Blk Time (%)		23	4		74	50		12		4	31
Queuing Penalty (veh)		0	0		0	0		0		21	166
Storage Bay Dist (m)	27.0			25.0			60.0		45.0		
Storage Blk Time (%)	62	22		47	39			26		15	
Queuing Penalty (veh)	262	48		285	93			26		16	

Intersection: 8: Maple Avenue & Site Access In Only

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (m)	4.6	14.0	12.4
Average Queue (m)	0.3	3.5	8.4
95th Queue (m)	3.0	12.1	15.5
Link Distance (m)		10.4	10.4
Upstream Blk Time (%)	0	3	29
Queuing Penalty (veh)	0	16	152
Storage Bay Dist (m)	10.0		
Storage Blk Time (%)	0	3	
Queuing Penalty (veh)	0	0	

Intersection: 10: Maple Avenue & Site Access Out Only

Movement	WB	SB	SB
Directions Served	LR	T	T
Maximum Queue (m)	24.7	40.8	51.1
Average Queue (m)	8.8	12.5	42.8
95th Queue (m)	27.1	41.2	62.4
Link Distance (m)	54.2	48.0	48.0
Upstream Blk Time (%)		5	36
Queuing Penalty (veh)		24	190
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 1303

Intersection: 1: Maple Avenue & Bellview Street

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	14.6	9.1
Average Queue (m)	8.1	1.8
95th Queue (m)	14.9	7.6
Link Distance (m)	175.3	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		15.0
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 2: Lakeshore Road & North Shore Boulevard East & Maple Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (m)	34.4	127.7	127.7	32.3	112.1	98.6	67.4	105.7	19.9	31.7	63.4
Average Queue (m)	34.3	127.7	122.1	27.4	97.9	79.7	27.4	104.0	9.5	15.6	29.3
95th Queue (m)	34.8	128.0	141.2	39.0	124.2	112.6	77.5	116.5	19.4	30.0	54.7
Link Distance (m)		123.1	123.1		107.5	107.5		101.1		74.6	74.6
Upstream Blk Time (%)		80	18		12	7		82			
Queuing Penalty (veh)		0	0		0	0		0			
Storage Bay Dist (m)	27.0			25.0			60.0		45.0		
Storage Blk Time (%)	74	15		28	51			81			
Queuing Penalty (veh)	358	52		99	68			26			

Intersection: 3: Maple Avenue & Site Access

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (m)	22.5	4.5
Average Queue (m)	9.7	0.5
95th Queue (m)	20.8	3.7
Link Distance (m)	107.6	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		10.0
Storage Blk Time (%)		0
Queuing Penalty (veh)		1

Network Summary

Network wide Queuing Penalty: 604

PARSONS

Brock 2 Development

Traffic Impact Study

July 2017

Prepared for:
Molinaro Group
472 Brock Avenue
Unit 103 Burlington ON
L7S 1N1



delivering a better world

Similar to the existing (2017) traffic analysis, the signalized and unsignalized intersections of Lakeshore Road with Maple Avenue and Brock Avenue are the only intersections within the study area which contain critical movements, as presented in **Table 6**.

The northbound and southbound approaches to the unsignalized intersection of Lakeshore Road and Brock Avenue continue to experience significant delay during both peak hours however this delay has only increased slightly. Again, the volumes on these approaches are minimal and it is not uncommon for vehicles on minor streets to experience this level of delay when waiting to enter a high volume major roadway. In addition, based on the v/c ratios presented in the table, there is still ample reserve capacity to accommodate future traffic growth.

Similarly, the operation of several movements at the signalized intersection of Lakeshore Road and Maple Avenue have decreased slightly with the introduction of background traffic growth. However, the overall intersection is forecast to continue operating at a level of service 'E' during both peak hours with the capacity to accommodate additional traffic growth.

4. FUTURE SITE GENERATED TRAFFIC

4.1 FUTURE SITE GENERATED TRAFFIC VOLUMES

The site traffic volumes for the proposed Brock 2 development were estimated using trip generation rates documented in the Institute of Transportation Engineers' (ITE), Trip Generation, 9th Edition. In particular, the following ITE Land Use Codes were utilized:

- High Rise Residential Condominium/Townhouse (Code 232);
- Pharmacy/Drugstore without Drive-Through Window (Code 880).

The resulting trips forecasted to be generated by the Brock 2 development during the weekday AM and PM peak hours are presented in **Table 7**.

It should be noted that based the proposed square footage of the pharmacy portion of the Brock 2 development (2,015ft^2), utilizing the trip generation formula found in the ITE manual for the AM peak hour results in a negative number. As a result, Parsons has used the average rate to generate trips for this land use during the AM peak hour.

4.2 TRIP DISTRIBUTION AND ASSIGNMENT

The forecasted traffic for the proposed Brock 2 development was distributed onto the study area roadway network utilizing the existing travel patterns of Ontario Street. Based on the site plan there is one access driveway proposed along Ontario Street which will be located directly opposite of the existing Burlington Towers Apartments driveway. All site trips were assigned to this driveway for all future analysis purposes. The resulting weekday AM and PM site trips volumes for the Brock 2 development can be found in **Appendix G**.

Table 7: Brock 2 Development Weekday AM & PM Peak Hour Trip Generation

ITE LAND USE CODE	NO. OF UNITS/1000FT² OF GFA	TRIP GENERATION FORMULA (AVG RATE USED IF NO FORMULA)	TOTAL TWO-WAY TRIP GENERATION	DIRECTIONAL SPLIT		NEW TRIPS	
				INBOUND %	OUTBOUND %	IN TOTAL	OUT TOTAL
AM PEAK HOUR							
High-Rise Residential Condominium/ Townhouse (232)	170 units	T=0.29(X) + 28.86	78	19%	81%	15	63
Pharmacy/Drugstore without Drive-Through Window (880)	2,015 ft²	2.94[1]	6	65%	35%	4	2
		Totals	**84**			**19**	**65**
PM PEAK HOUR							
High-Rise Residential Condominium/ Townhouse (232)	170 units	T=0.34(X) + 15.47	73	62%	38%	46	27
Pharmacy/Drugstore without Drive-Through Window (880)	2,015 ft²	8.40	17	49%	51%	9	8
		Totals	**90**			**55**	**35**

[1] - *Note the average rate for this land use was used and not trip generation formula.*

MT-0400 (Eastern Daylight Time) - Run Time: 2042ms

m - Trip - 2016 v1.1				North		South		East		West		
		Auto drive	%	#	%	#	%	#	%	#		
gin - pd_orig	PD 13 of Toronto	14	75%	11		0	25%	4		0	1	
le of trip - mode_prime	Mississauga	29	75%	22		0	25%	7		0	0	
	Oakville	42	50%	21		0	50%	21		0	0	
	Burlington	399	25%	100	25%	100	25%	100	25%	100	1	
	Flamborough	53	20%	11		0		0	80%	42	0	
on - gta06_dest In 4057	Ancaster	21		0		0		0	100%	21	0	
	Stoney Creek	114		0	100%	114		0		0	0	
In 700-899	Hamilton	129		0	50%	65		0	50%	65	1	
	West Lincoln	12		0	100%	12		0		0	0	
mode_prime In D,	City of Guelph	19	100%	19		0		0		0	0	
		832	22%	184	35%	291	16%	132	27%	228	3	

	AS-IS	ROUNDED
North	22%	20%
South	35%	35%
East	16%	15%
West	27%	25%
		95%

Time) - Run Time: 2131ms

	Auto drive	%	North #	%	South #	%	East #	%	West #	
PD 1 of Toror	21	75%	16		0	25%	5			0
PD 11 of Torc	19	75%	14		0	25%	5			0
Brampton	100	75%	75		0	25%	25			0
Mississauga	108	75%	81		0	25%	27			0
Oakville	209	50%	105		0	50%	105			0
Burlington	1054	25%	264	25%	264	25%	264	25%		264
Flamborough	37	20%	7		0		0	80%		30
Dundas	24	20%	5		0		0	80%		19
Stoney Creek	133		0	100%	133		0			0
Hamilton	240		0	50%	120		0	50%		120
Niagara Falls	30		0	100%	30		0			0
Fort Erie	19		0	100%	19		0			0
Kitchener	36	50%	18		0		0	50%		18
City of Guelpl	48	100%	48		0		0			0
	2078	30%	633	27%	566	21%	431	22%		451

	AS-IS	ROUNDED
North	30%	30%
South	27%	25%
East	21%	20%
West	22%	20%
	100%	95%

tern Daylight Time) - Run Time: 1725ms

			North		South		East		West		
6 v1.1		Auto drive	%	#	%	#	%	#	%	#	
	PD 1 of Toror	31	75%	23		0	25%	8		0	0
le_prime	PD 8 of Toror	10	75%	8		0	25%	3		0	1
	PD 9 of Toror	39	75%	29		0	25%	10		0	0
	Mississauga	137	75%	103		0	25%	34		0	0
	Halton Hills	14	100%	14		0		0		0	0
st In 4057	Milton	82	100%	82		0		0		0	0
	Oakville	263	50%	132		0	50%	132		0	1
	Burlington	1455	25%	364	25%	364	25%	364	25%	364	1
	Flamborough	51	20%	10		0		0	80%	41	0
In D,	Hamilton	494		0	50%	247		0	50%	247	0
	Grimsby	8		0	100%	8		0		0	0
	Niagara Falls	21		0	100%	21		0		0	0
	Fort Erie	19		0	100%	19		0		0	0
	Kitchener	36	50%	18		0		0	50%	18	0
	Cambridge	25		0		0		0	100%	25	0
		2685	29%	783	25%	659	21%	551	26%	695	3

	AS-IS	ROUNDED
North	29%	30%
South	25%	25%
East	21%	20%
West	26%	25%
	100%	100%

Fri Aug 10 2018 14:10:03 GMT-0400 (Eastern Daylight Time) - Run Time: 2105ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest

Column: Primary travel mode of trip - mode_prime

Filters:

2006 GTA zone of origin - gta06_orig In 4057

and

Start time of trip - start_time In 1600-1799

and

Primary travel mode of trip - mode_prime In D,

Trip 2016

Table:

		North		South		East		West			
	Auto drive	%	#	%	#	%	#	%	#		
	Brampton	45	75%	34		0	25%	11		0	0
	Mississauga	15	75%	11		0	25%	4		0	0
	Milton	81	100%	81		0		0		0	0
	Oakville	80	50%	40		0	50%	40		0	0
	Burlington	1313	25%	328	25%	328	25%	328	25%	328	1
	Flamborough	73	20%	15		0		0	80%	58	0
	Ancaster	36		0		0		0	100%	36	0
	Hamilton	234		0	50%	117		0	50%	117	0
	Lincoln	17		0	100%	17		0		0	0
	West Lincoln	12		0	100%	12		0		0	0
	Cambridge	4		0		0		0	100%	4	0
	Wilmot	22	50%	11		0		0	50%	11	0
	Kawartha Lak	19	80%	15		0	20%	4		0	0
	Brantford	32		0		0	100%	32		0	0
,Auto driver		1983	27%	535	24%	474	21%	419	28%	554	1

Brampton,45
Mississauga,15
Milton,81
Oakville,80
Burlington,1313
Flamborough,73
Ancaster,36
Hamilton,234
Lincoln,17
West Lincoln,12
Cambridge,4
Wilmot,22
Kawartha Lakes,19
Brantford,32

	AS-IS	ROUNDED
North	27%	25%
South	24%	25%
East	21%	20%
West	28%	30%
	100%	100%

8/10/2018

3:44 PM

	A.M. Peak Hour	P.M. Peak Hour
Direction	In (Out)	In (Out)
North	20% (30%)	30% (25%)
South	35% (25%)	25% (25%)
East	20% (25%)	20% (20%)
West	25% (20%)	25% (30%)

AM		PM	
IN	OUT	IN	OUT
20%	30%	30%	25%
35%	25%	25%	25%
20%	**25%**	**20%**	**20%**
25%	**20%**	**25%**	**30%**

		AM		PM	
DIRECTION	VIA	IN	OUT	IN	OUT
EAST	Lake Shore Road	20%	**25%**	20%	20%
WEST	North Shore Boul	**25%**	20%	**25%**	**30%**
NORTH	Maple Avenue	10%	15%	15%	13%
	QEW	10%	15%	15%	13%
SOUTH	Lake Shore Road	18%	13%	13%	13%
	QEW	**18%**	13%	13%	13%
		100%	100%	100%	100%

		AM		PM	
DIRECTION	VIA	IN	OUT	IN	OUT
EAST	Lake Shore Road	20%	25%	20%	20%
WEST	North Shore Boul	53%	48%	53%	**55%**
NORTH	Maple Avenue	10%	15%	15%	13%
SOUTH	Lake Shore Road	18%	13%	13%	13%
		100%	100%	100%	100%

APPENDIX G

Relevant Maps and Zoning By-Law Excerpts

All indoor fitness classes to be paused, sport groups...

Burlington, Ont.–Oct. 16, 2020– Following the recommendation...

Learn More



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2.0 General Provisions

Any Use of this document is subject to this disclaimer.

2.1 Accessory Uses

2.1.1

Where a use is permitted by a zone designation in this bylaw, any use that is accessory to such use is also permitted, notwithstanding, the following are deemed not to be accessory uses:

- Retail propane transfer facilities
- Private propane transfer facilities
- Propane cylinder handling facilities
- Bulk propane storage depot
- Garages attached to a dwelling either directly or by indirect structural means
- Adult Entertainment Establishment

2.1.2

The following accessory uses shall be subject to the regulations specified:

- Decks, subject to Part 1, Subsection 2.3
- Fencing and Privacy Screens, subject to Part 1, Subsection 2.4
- Swimming Pools, subject to Part 1, Subsection 2.5
- Electronic Game and Pinball Machine Arcade, subject to Part 1, Subsection 2.6

(i) Front or street side lot lines are equal to or greater than 18 m in width.
(ii) Maximum width of a walkway shall be 2 m.
(iii) The widest point not including the 2 m hammerhead extension shall not exceed a maximum of 7 m.
(iv) Shall have a maximum width of 3 m.
(v) Shall have a maximum length of 2 m extending perpendicularly from the driveway.
(vi) Shall be setback a minimum of 0.5 m from the interior and street side lot lines.

See Section 1.13, Illustration No. 5 - Hammerhead Driveway

(h) Properties located within the Shoreacres Character Area as identified in Part 2 - Residential Zones, Section 4.9 Character Area Maps, regardless of lot width, shall be subject to subsection (e) above. Circular and hammerhead driveways are subject to subsections (f) and (g) above.

2.25 Off Street Parking and Loading Requirements

2.25.1

Whenever new development occurs or whenever an existing development is enlarged, extended or increased in capacity, in accordance with this By-Law, off street vehicle parking spaces shall be provided and maintained on the property and within the zone designation for all uses, except, within the "Downtown Parking Exemption Area" shown on Diagram 1A, Subsection 2.25 shall only apply to residential uses.

2.25.2

Off-Street parking shall be in accordance with Part 1, Subsection 2.26, "General Parking Provisions"

2.25.3

At least one off-street loading space shall be provided in conjunction with every principal building, including mixed use buildings, but excluding residential buildings less than 4 storeys high.

2.25.4

The number of parking spaces required for permitted uses in all zones shall be in accordance with as follows, unless otherwise specified in the respective zones.

TABLE 1.2.6 OFF-STREET PARKING STANDARDS

USE	PARKING STANDARD

USE	PARKING STANDARD
Detached Dwelling Semi-Detached Dwelling Duplex Dwelling Triplex Dwelling	2 spaces per unit; one of which may be provided in an attached or detached garage Detached, Semi-Detached, Duplex and Triplex Dwelling on a parcel of tied land fronting onto a common element condominium road : 1.5 spaces per unit where 1 space shall be located on the parcel of tied land and .5 space per unit for visitor parking shall be located within the common element condominium block which contains the condominium roadway
Street Townhouse Dwelling Street Triplex Dwelling Street Fourplex Dwelling	2 spaces per unit
Townhouse Dwelling Fourplex Dwelling Cluster Homes	2 occupant spaces per unit, 0.50 visitor spaces per unit
Stacked Townhouse Dwellings Back to Back Townhouse Dwellings	Without exclusive use garage: 1.25 occupant spaces per one bedroom unit 1.50 occupant spaces per two bedroom unit 1.75 occupant spaces per three or more bedroom 0.35 visitor spaces per unit With exclusive use garage: 2.0 occupant spaces per unit, 0.35 visitor spaces per unit
Apartment Building	1.25 occupant spaces per one bedroom unit 1.50 occupant spaces per two bedroom unit 1.75 occupant spaces per three or more bedroom 0.35 visitor spaces per unit
Dwelling Units on the 2nd or 3rd floor of a 2 or 3 storey commercial building	1.25 spaces per unit
Adult Entertainment Establishment	1 space per 2 persons capacity

USE	PARKING STANDARD
Allotment Garden	1 space per garden plot
Bank, Trust Company, Credit Union	5 spaces per 100 m^2 gross floor area
Bed & Breakfast Home Boarding House	1 space per guest room in addition to the parking requirement for a detached dwelling
Cemetery	1 space per employee plus 1 per 4 seats chapel capacity
Community Institution	1 space per 4 persons capacity
Convent, Monastery	1 space per two beds
Convention/Conference /Banquet Centre	10 spaces per 100 m^2 gross floor area
Correctional Facility	0.85 spaces per employee 0.25 visitor spaces per resident
Correctional Group Home	4 parking spaces
Day Care Centre	4 spaces per 100 m^2 gross floor area
Emergency Shelter	0.85 spaces per employee 0.25 visitor spaces per resident
Entertainment Establishment	10 spaces per 100m^2 gross floor area
Funeral Home, Mortuary, Crematorium	4 spaces per 100 m^2 gross floor area, 15 spaces minimum
Group Home	2 parking spaces
Home Based Business	None Required
Home Day Care	None Required
Hospital, Health Care Facility	0.65 spaces per patient bed
Hotel	1 space per guest room or suite
Industrial Uses	1 space per 100 m2 gross floor area
Kennel	1 space per employee plus 1 per 100 m^2 gross floor area

USE	PARKING STANDARD
Library, Museum, Post Office	0.75 spaces per employee plus 1.5 spaces per 100 m^2 GFA
Lodge, Fraternity, Private Club	1 space per 4 persons capacity
Long Term Care Facility	0.85 spaces per employee, plus 0.25 spaces per bed
Multi-Use Business Park	3 spaces per 100m^2 of gross floor area where more than 30% of the building is used for office space, or 2.0 spaces per 100m^2 of gross floor area where less than 30% of the building is used for office space
Night Club, Dance Hall	1.1 spaces per 4 persons
Office: Medical Other	6 spaces per 100m^2 gross floor area 3 spaces per 100m^2 gross floor area
Place of Assembly	6 spaces per 100m^2 gross floor area
Place of Worship	0.2 spaces per seat or prayer space or 6 spaces per 100m^2 of gross floor area whichever is higher
Recreational Establishment	5.5 spaces per 100m^2 of gross floor area
Retail Store	3.5 spaces per 100m^2 gross floor area
Retail Centre	5 spaces per 100m^2 gross floor area
Residential Social Service	0.85 spaces per employee 0.25 visitor spaces per resident
Restaurant: Fast Food Restaurant	10 spaces per 100m^2 of gross floor area
Restaurant: Standard Restaurant	18.5 spaces per 100m^2 of gross floor area
Restaurant: Outdoor Patio	None Required
Retirement Home	0.85 spaces per employee, plus 0.50 occupant spaces per unit, plus 0.25 visitor spaces per unit

USE	PARKING STANDARD
School: Elementary	1.5 spaces per classroom
Secondary	3 spaces per classroom
Post-Secondary	5 spaces per classroom plus 1 space per 6 person capacity of auditoriums
Business, Commercial Trade	5 spaces per 100m^2 of gross floor area
Service Commercial Uses	4 spaces per 100m^2 gross floor area
Storage Locker Facility	0.5 spaces per 100m^2 of gross floor area
Supermarket	6 spaces per 100m^2 gross floor area
Warehouse and Logistics	1.5 spaces per 100m^2 of gross floor area

Diagram 1A:Downtown Parking Exemption Area

Final Report

Burlington City-Wide Parking Standards Review

Consolidated Report

Prepared for City of Burlington
by IBI Group
July 21, 2017

and similarly, easy for developers to predict what would be required of their projects. Such codes also tend to be comprehensible to a broader audience since they directly reference the built form. Form-based codes are thus easier to understand, enforce, and represent graphically.

In terms of parking requirements, the minimum and/or maximum standards might be specifically defined for various building envelope or street section characterizations, but across broad land-use categories (such as those used in the SmartCode: residential, lodging, office, retail, civic, and other[10]). Given the nature of form-based standards, parking requirements would also likely include details related to their design. It would be very challenging, however, to integrate a form-based approach to parking standards within a traditional zoning by-law, as presently exists within the City of Burlington, and the resulting by-law would be quite complicated.

4.2 Defining a Parking Structure for Burlington

Burlington Zoning By-law 2020 currently uses a combination of general provisions (Generic Standards), area stratification, and some reduction factors. The structure for the updated standards will follow Burlington's existing structure, with some slight modifications, which are defined below. This structure is a hybrid structure which takes advantage of the benefits of the various structure types described in Section 4.1

4.2.1 Adjusting Existing Land Use Categories

One of the updates to the existing structure will include reconciling the existing land use categories. There are opportunities to introduce new categories, as well as opportunities to group separate categories into the same standard. The justification for these adjustments is based on results from the parking survey that was conducted as part of this study. The full list of categories and suggested changes can be found in Appendix E.

4.2.2 Updating the Area Stratification

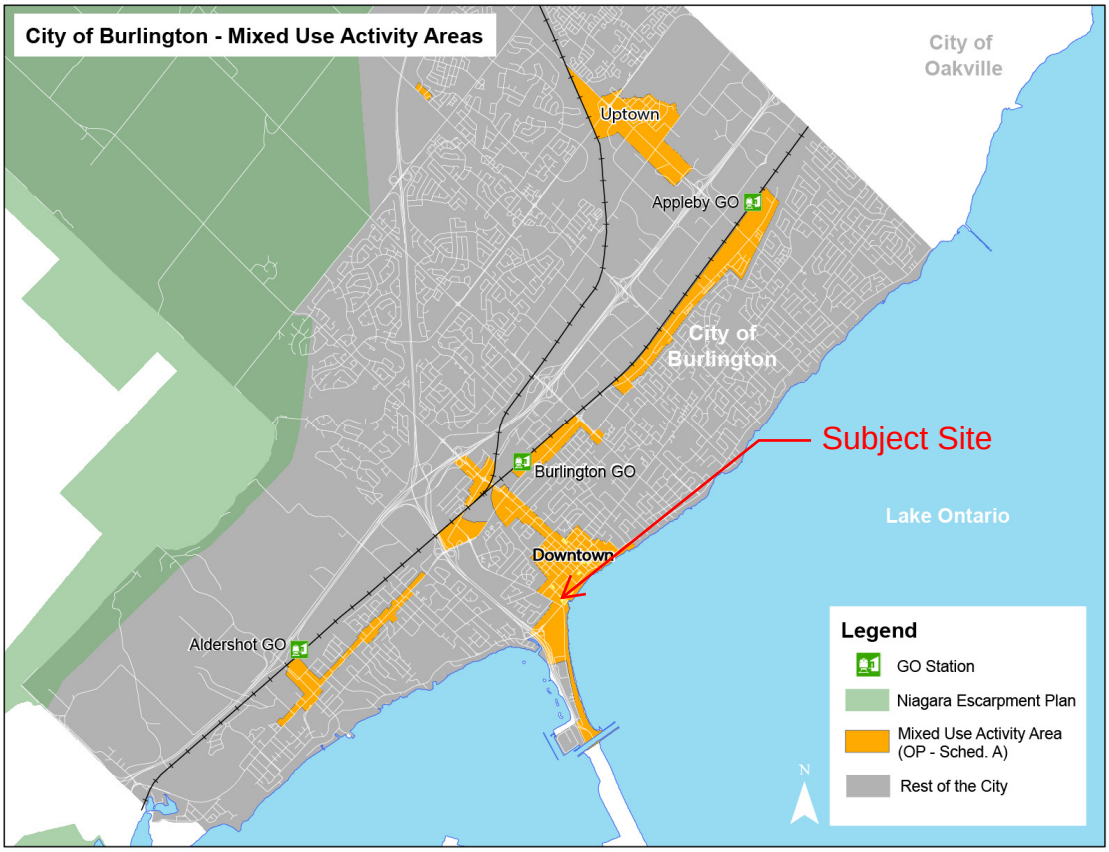
As identified in the Background Section of this report, there are several special planning areas in Burlington which have a different set of city building objectives. Burlington currently applies area specific standards in the Downtown Mixed Use Centre Zones, in Uptown Mixed Use Centre Zones, and in Mixed-Use Corridor Zones.

These reductions are somewhat inconsistent and there is an opportunity to apply them to a greater and more generic growth area.

The Mixed Use Activity Areas are a special policy area, which are identified in Schedule A of the Official Plan. These areas will undergo redevelopment which will profile a mixture of land uses, intensification, and a transit and pedestrian oriented urban form. The draft urban structure, which will be considered for inclusion in the update of the City's official plan includes an expansion of these areas and therefore should be considered as an update to the Mixed Use Activity areas for the purpose of area stratification of the parking standards. The existing Mixed Use Activity Areas are mapped in Exhibit 4.1. For the purpose of this document, the expanded Mixed Use Activity Area will be referred to "Intensification Areas."

[10] Duany, Sorlien, & Wright (2007) SmartCode Version 9.0.

Exhibit 4.1: Mixed Use Activity Areas



Intensification Areas

For the purpose of these parking standards, which were written prior to the new Official Plan, the term Intensification Areas is used. This area will be represented by all intensification related land uses that will be designated in the new official plan.

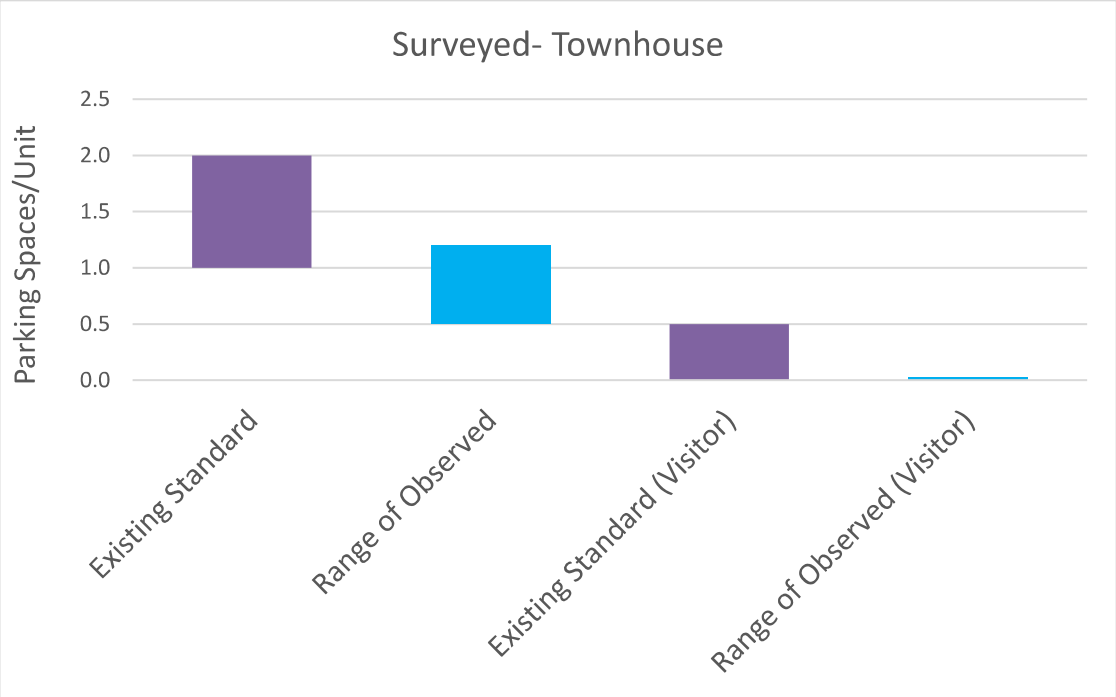
Other Areas

These "Other Areas" are areas that are not included in Intensification areas, for which parking standards not included in the Intensification Areas will be applied, and are referred to as Other Areas in the tables later in this document.

Downtown Exemption Area

The downtown exemption area should be maintained in the updated parking standards. This area is illustrated in Exhibit 4.2.

Exhibit 6.12: Observed Demand for Townhouse



Recommendations

It is recommended that any requirements for the Uptown Mixed Use Centre zone be applied to entirety of the Intensification Areas. Similar to the previous townhouse residential land uses, for the townhouse, Fourplex, and cluster homes, it is recommended to keep the by-law based on parking spaces per unit. It is also recommended to have a minimum and a maximum for the Intensification Areas, with the minimum having a lower rate than the Other Areas of Burlington. A summary is presented in Exhibit 6.13.

Exhibit 6.13: Recommendations – Townhouse, Fourplex, Cluster Homes (Spaces/Unit)

Land use	Existing rate	Max observed rate	ITE average Demand	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Townhouse, fourplex, cluster homes	O: 1.0 - 2.0 V: 0 - 0.5	O: 1.2 V: 0.03	O: 1.28	O: 2.0 V: 0.25	O: 1.0 V: 0.20	O: 2.0 V: 0.25

*These recommendations are based on the assumption that a garage may be counted towards the supply and that space in a driveway that leads to a garage be counted as one space.

Note: V=Visitor, O=Occupant BR = Bedroom

6.1.7 Apartment Buildings

Zoning By-law Definition: Apartment buildings are defined as buildings consisting of more than four dwelling units, which units have a common entrance from the street level and where the occupants have the right to use in common, halls, stairs, yards and accessory buildings.

Parking Characteristics: Parking is provided off-street, in a surface, structure, or underground parking lot.

Existing Requirements

General provisions:

- 1.25 occupant space per one-bedroom unit
- 1.50 occupant spaces per two bedroom unit
- 1.75 occupant spaces per three-or more bedroom unit
- 0.35 visitor spaces/unit

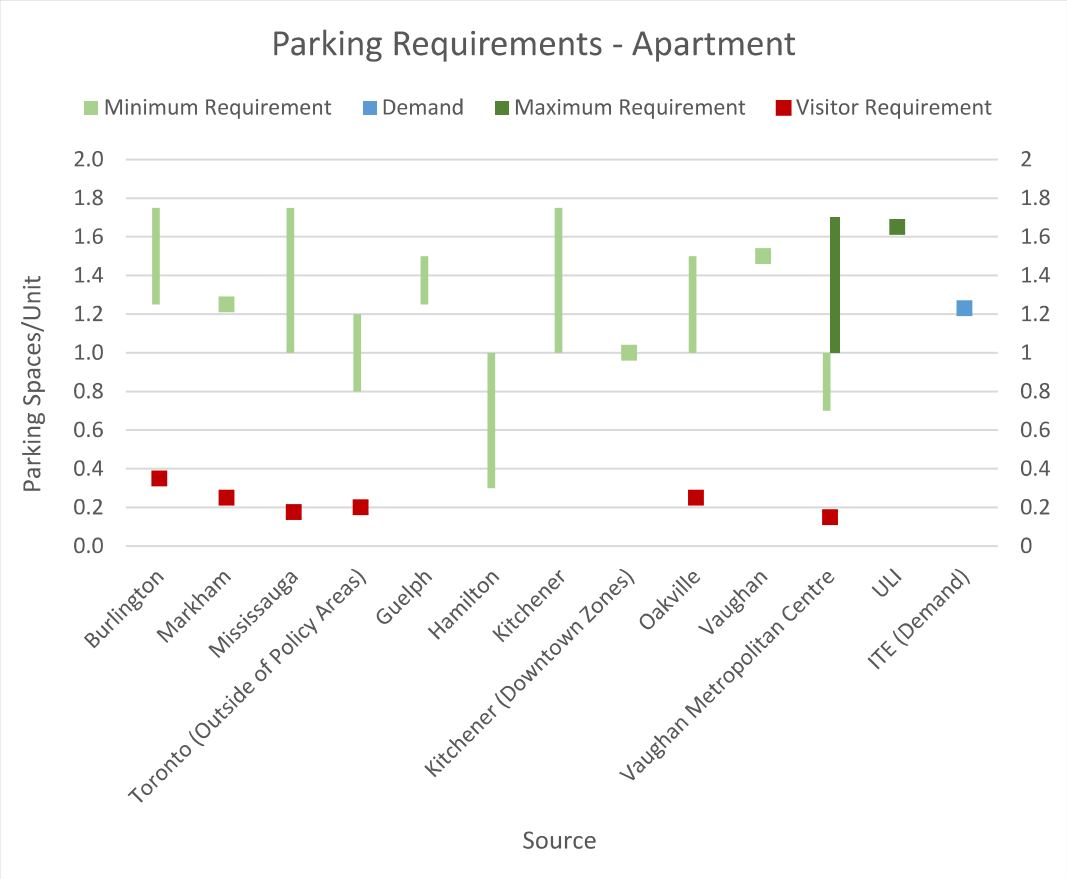
Downtown Mixed Use Centre Zones:

- 1.25 spaces/unit, no visitor requirements

Peer Review

The occupant parking requirements for apartment buildings in peer jurisdictions range from less than 0.5 spaces/unit to as many as 1.75 spaces/unit. The average demand observed by ITE was 1.21 spaces/unit. The parking requirements for visitor spaces in apartment buildings ranges from 0.25 visitor spaces/unit to 0 in some cases. The peer review is summarized in Exhibit 6.14.

Exhibit 6.14: Parking Requirements – Apartment



An additional comparison, broken down by bedroom for the various municipalities, is shown in Exhibit 6.15.

Exhibit 6.15: Minimum and Maximum Parking Requirements By Bedroom Size for Various Municipalities

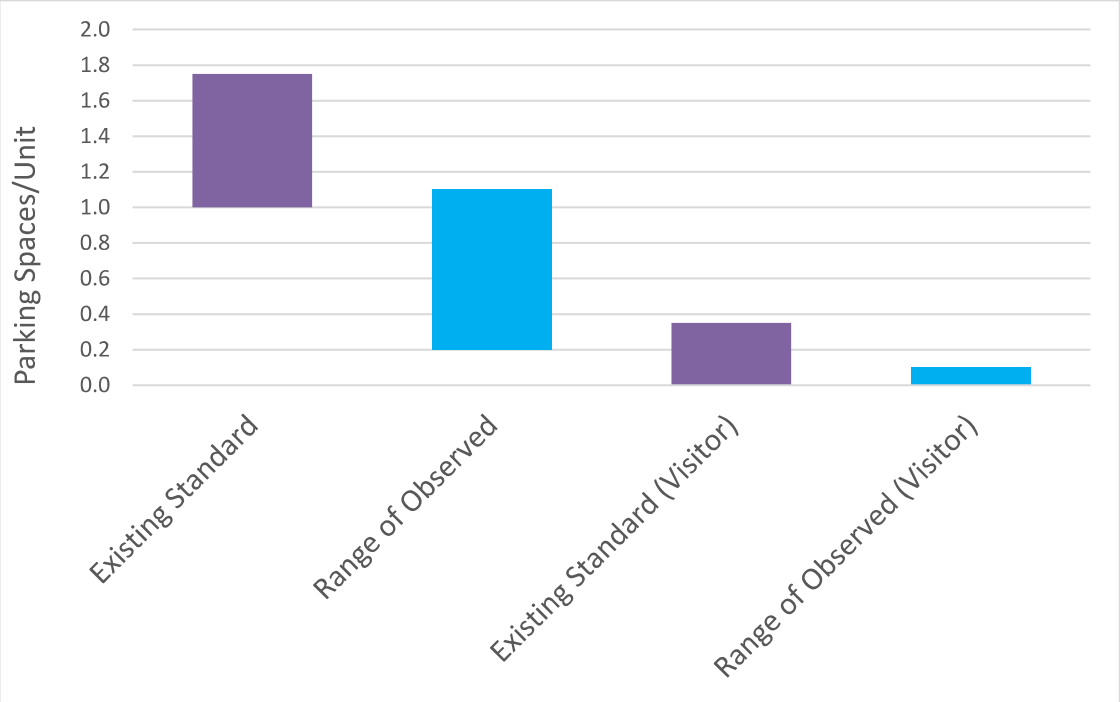
Source	Minimum and [Maximum] Parking Requirement (Spaces / Unit)				
	Bachelor	1 bedroom	2 bedroom	3 bedroom+	Visitor
Burlington	1.25	1.25	1.50	1.75	0.35
Markham	1.25	1.25	1.25	1.25	0.25
Mississauga	1.00	1.25	1.40	1.75	0.20
Toronto (Downtown PA1)	0.30 [0.40]	0.50 [0.70]	0.80 [1.20]	1.00 [1.50]	0.10
Toronto (Outside of Policy Areas)	0.80	0.90	1.00	1.20	0.20
Guelph	First 20 units: 1.5 spaces/unit Each unit in excess of 20: 1.25 spaces/unit				-
Hamilton	GFA < 50 m2: 0.30 Otherwise: 1.00				-
Kitchener	3-5 units total: 1 space/unit 6-12 units total: 1.5 spaces/unit 13-60 units total: 1.75 space/unit 61+ units total: 1.5 space/unit				6-60 units: 15% of req. parking 61+ units: 20% of req. parking
Kitchener (Downton Zones)	1.00	1.00	1.00	1.00	
Vaughan	1.50	1.50	1.50	1.50	0.25
Vaughan Metropolitan Centre	0.70 [1.00]	0.70 [1.00]	0.90 [1.30]	1.00 [1.70]	0.15

Exhibit 6.15 demonstrates the range of minimum and maximum rates for the various municipalities, some of which have rates for bachelor apartments as low as 0.30 spaces/unit and as high as 1.5 spaces per unit.

Observed Parking Demand

A total of 16 spot surveys were conducted at three different locations during the peak parking demand period (Weekdays between 20:00 and 23:00). The maximum observed parking demand from the spot surveys was 1.1 spaces/unit, with a maximum observed visitor demand of 0.1 spaces/unit. The observations are summarized in Exhibit 6.16.

Exhibit 6.16: Observed Demand for Apartments



Site Specific Review

An apartment building that included 18 parking spaces instead of the required 27 spaces was surveyed as part of the site specific review.

The maximum observed utilization of the site was 94%, which equates to a parking demand rate of 0.63 parking spots/unit. The site was not located adjacent quality public transit, it did not have a carshare, and had a walkscore of 37%, which suggests that it is not accommodating for active transportation or transit trips. It was, however, located adjacent to a public park, which had a large parking lot for use by park patrons. Overnight parking is not permitted at the park, but may have been used if there was any overflow during day time hours.

In cases where parking supply is reduced compared to the by-law requirement, it should be based on the condition that high quality public transit is provided adjacent the property, or that the property is accommodating to active transportation and is located in a walkable area. The presence of a community car share parking spot would also provide grounds for a parking reduction at an apartment. Further discussion around off-site parking opportunities is included in Section 9: Parking Management Strategies.

Recommendations

- Change the existing general provisions that are based on spaces/unit, and convert to space for certain bedroom units for Mixed Used Activity Areas;
- Establish a minimum of 1.0 spaces per unit in Intensification Areas, and a maximum of 1.5 spaces per unit in these areas;
- Reduce the existing general provisions by 0.25 spaces/unit for each bedroom category for Other Areas of Burlington;

- Apply a visitor parking requirement of 0.25 spaces/unit in Intensification Areas, and 0.25 spaces/unit in Other Areas, but maintain that visitor parking can be shared with other uses in Intensification Areas, due to the differing peak periods of demand; and
- Provide 1.0 parking spaces that is designated for maintenance vehicles that are servicing the site for every 75 units. Service vehicles must obtain a visitor (service vehicle) parking permit. These spaces should also be the same dimensions as an accessible parking space to allow for unloading and loading of equipment and to accommodate the larger service vehicles.

A summary of the recommendations is provided in Exhibit 6.17.

Exhibit 6.17: Recommendations – Apartment Building (spaces/nits)

Land use	Existing rate (spaces/unit)	Max observed rate	ITE average Demand	Intensification Areas		Burlington – other areas
				Maximum	Minimum	Minimum
Apartment	1 BR: 1.25 2 BR: 1.50 3 BR: 1.75 O: downtown is 1.25 V: 0 - 0.35	O: 1.1 V: 0.1	O: 1.2	O (all): 1.5 V: 0.25	O (all): 1.0 V: 0.25	Bachelor / 1 BR: 1.0 2 BR: 1.25 3 BR: 1.50 V: 0.20
In addition to the required parking supply noted above, 1.0 parking space for every 75 units should also be added to the supply and reserved as "maintenance vehicle parking." These spaces should only be available to the vehicles of building maintenance crews. In cases where visitor permits can be obtained, service parking permits should also be issued under the condition that works need to be completed in the building.						

Note: V=Visitor, O=Occupant BR = Bedroom

6.1.8 Long term care facility

Zoning By-law Definition: A long term care facility is a residence which provides care to meet the physical, emotional, social, spiritual and personal needs of persons.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

0.85 spaces per employee, plus 0.25 spaces/bed.

Peer Review

Peer jurisdictions primarily use number of beds as the metric for parking requirements for long-term care facilities. It is therefore difficult to directly compare Burlington to its peers. The peer summary in Exhibit 6.18 only includes comparisons to municipalities that use a spaces/bed measuring rate. Based on a spaces/bed metric, peers tend to range around 0.3-0.35 spaces/bed. The demand observed by ITE was 0.35 spaces/bed.

BY-LAW NUMBER 2020.XXX AND EXPLANATORY NOTE

THE CORPORATION OF THE CITY OF BURLINGTON

BY-LAW NUMBER 2020.XXX

A By-law to amend By-law 2020, as amended for Residential Parking Rates

File No.: 520-02-67

WHEREAS Section 34(1) of the Planning Act, R.S.O. 1990, c. P. 13, as amended, states that Zoning By-laws may be passed by the councils of local municipalities; and

WHEREAS the Council of the Corporation of the City of Burlington approved the Recommendation in report PB-65-19 on _____2019 , to amend the City's existing Zoning By-law 2020, as amended, to update city-wide residential parking rates;

THE COUNCIL OF THE CORPORATION OF THE CITY OF BURLINGTON HEREBY ENACTS AS FOLLOWS:

1. PART 1 of By-law 2020, as amended, General Conditions and Provisions, Section 2.25, Table 1.2.6 Off-Street Parking Standards is amended as follows:

   Remove references to "Triplex Dwelling" from the second row of Table 1.2.6, and the reference to "Street Triplex Dwelling" from the third row of Table 1.2.6.

   Add the following parking regulations for "Triplex" and "Street Triplex Dwelling"

"Triplex Dwelling	1 occupant space per unit 0.33 visitor spaces per unit
Street Triplex Dwelling	2 spaces per unit A Triplex Dwelling on a parcel of tied land fronting onto a common element condominium road: 1.5 spaces per unit where 1 space shall be located on the parcel of tied land and 0.5 space per unit for visitor parking shall be located within the common element

condominium block which contains the condominium roadway."

2. PART 1 of By-law 2020, as amended, General Conditions and Provisions, Section 2.25, Table 1.2.6 Off-Street Parking Standards is amended as follows:

   Change the visitor parking rate for "Townhouse, Fourplex and Cluster Homes" to 0.25 spaces per unit.

3. PART 1 of By-law 2020, as amended, General Conditions and Provisions, Section 2.25, Table 1.2.6 Off-Street Parking Standards is amended as follows:

   Separate the categories for "Stacked Townhouse Dwellings" and "Back to Back Townhouse Dwellings" and change the parking rates as follows:

"Stacked Townhouse Dwellings	1 occupant space per unit
	0.25 visitor spaces per unit
Back to Back Townhouse Dwellings	2 occupant spaces per unit
	0.25 visitor spaces per unit"

4. PART 1 of By-law 2020, as amended, General Conditions and Provisions, Section 2.25, Table 1.2.6 Off-Street Parking Standards is amended as follows:

   Change the parking rate for "Apartment Building" as follows:

"Apartment Building	1 occupant space per one-bedroom unit
	1.25 occupant spaces per two-bedroom unit
	1.5 occupant spaces per three or more bedroom unit
	0.25 visitor spaces per unit
	1 additional space per 75 units for the use of maintenance vehicles servicing the site

5. PART 1 of By-law 2020, as amended, General Conditions and Provisions, Section 2.25, Table 1.2.6 Off-Street Parking Standards is amended as follows:

   Change the parking rate for "Long Term Care Facility" to 0.35 spaces per bed

6. PART 1 of By-law 2020, as amended, General Conditions and Provisions, Section 2.25, Table 1.2.6 Off-Street Parking Standards is amended as follows:

   Change the parking rate for “Retirement Home” to:

   Occupant/Employee: 0.6 spaces per unit

   Visitor: 0.25 spaces per unit

   1 additional space per 50 units for the use of maintenance vehicles servicing the site

7. *PART 2 of By-law 2020, as amended, Residential Zones, Section 3, Table 2.3.1 Footnote (a) is amended as follows:*

   Delete the section of the footnote entitled “Parking” including Table 2.3.1.1 and replace with the following:

   “Parking: one space per accessory unit.

   Parking for the principle dwelling and the accessory dwelling unit shall not be permitted in that portion of the rear yard defined as the area between the extension of the two lines projected backward from the two side walls of the dwelling.”

8 a) When no notice of appeal is filed pursuant to the provisions of the *Planning Act*, R.S.O. 1990, c.P.13, as amended, this By-law shall be deemed to have come into force on the day it was passed

8 b) If one or more appeals are filed pursuant to the provisions of the Planning Act, as amended, this By-law does not come into force until all appeals have been finally disposed of, and except for such parts as are repealed or amended in accordance with an order of the Ontario Municipal Board this By-law shall be deemed to have come into force on the day it was passed.

ENACTED AND PASSED this ……..day of …… 2019.

_____MAYOR

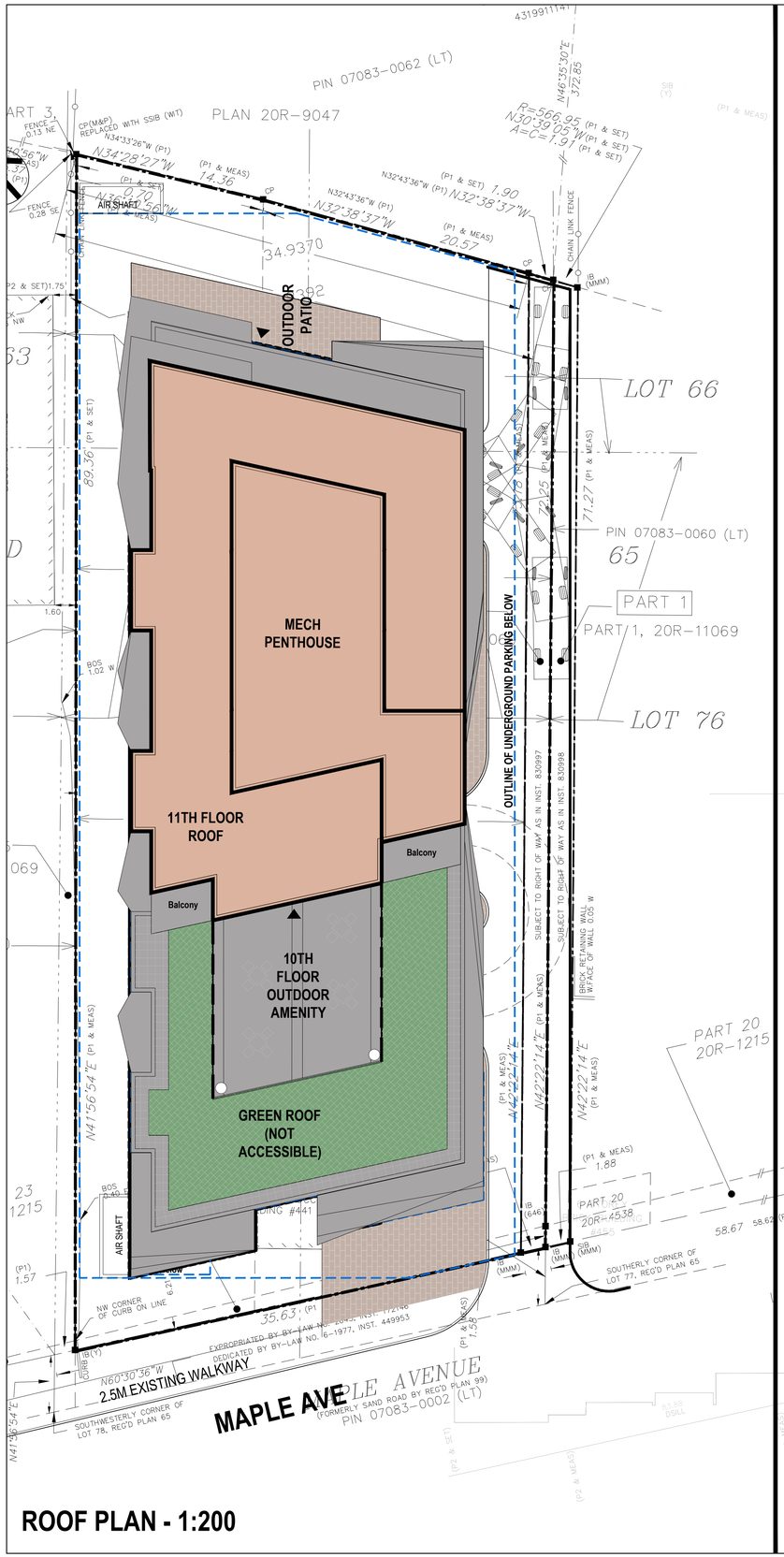
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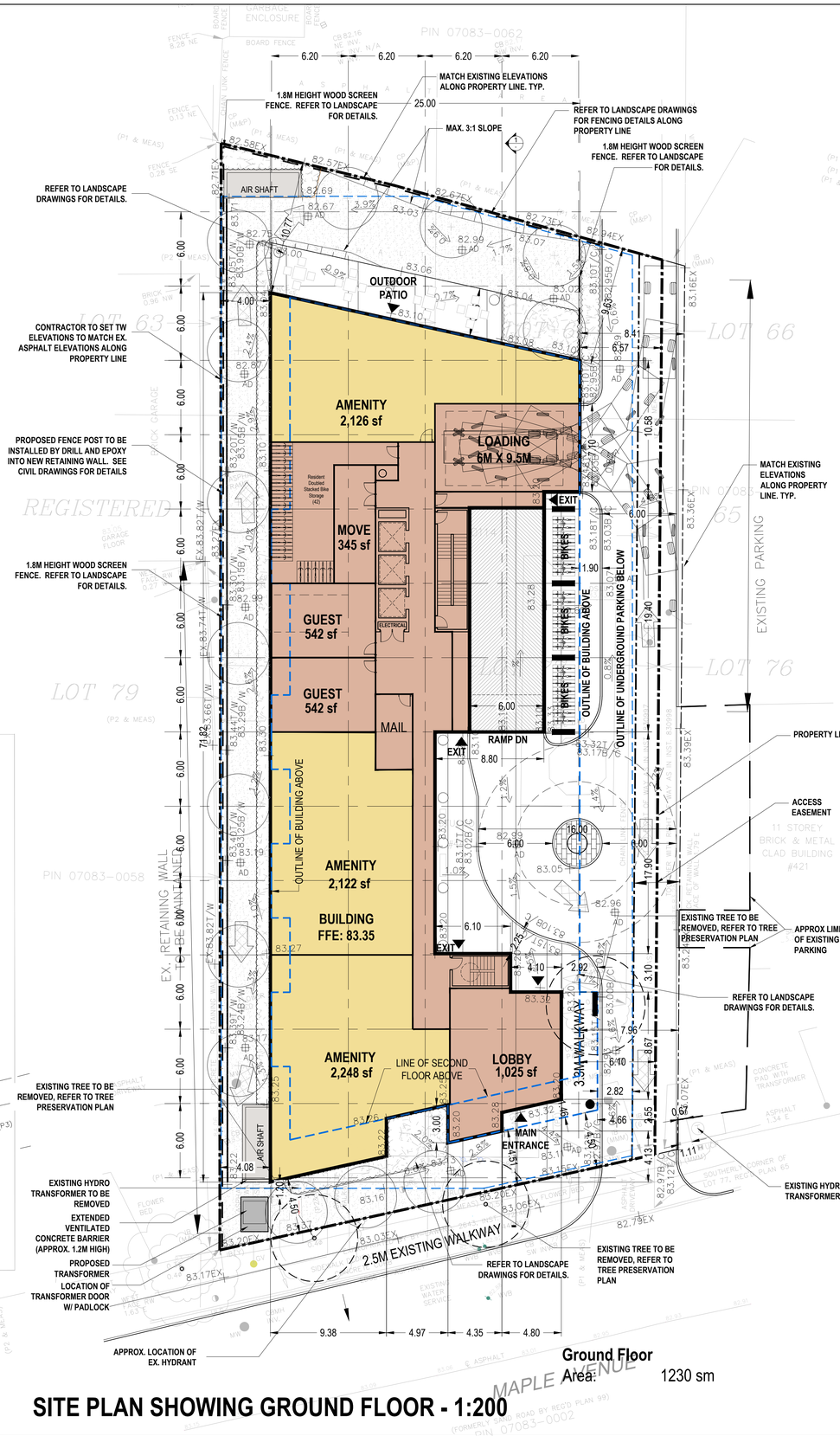
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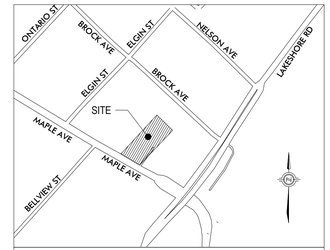
By-law 2020.XXX updates the parking rates for residential land uses.

For further information regarding By-law 2020.XXX, please contact Rosalind Minaji of the Burlington City Building Department at (905) 335-7600, extension 7809.

FIGURES







Key Plan

SITE STATISTICS

PROPOSED USE	Multi - Residential
SITE AREA	0.28 HA (2, 863.19 sq.m)
STOREYS	11 Storeys
UNITS	140 Units
PARKING	162 Cars on Site
RATIO	1.16
LONG TERM BIKE PARKING	70
RATIO	0.5
SHORT TERM BIKE PARKING	24
RATIO	0.17

AREA CALCULATION

AREA BREAK DOWN PER FLOOR

	AREA (SQ.M)	AREA (SQ.FT)
Ground Floor	1,230	13,240
Second Floor	1,507	16,220
Third Floor	1,507	16,220
Forth Floor	1,507	16,220
Fifth Floor	1,507	16,220
Sixth Floor	1,507	16,220
Seventh Floor	1,507	16,220
Eighth Floor	1,507	16,220
Ninth Floor	1,507	16,220
Tenth Floor	866	9,322
Eleventh Floor	866	9,322
TOTAL AREA ABOVE GRADE:	15,018	161,644
P1	2,540	27,287
P2	2,540	27,287
P3	2,540	27,287
TOTAL AREA BELOW GRADE:	7,620	81,861

UNIT COUNT

UNIT BREAK DOWN PER FLOOR

	1 BED	1 BED + D	2 BED	2 BED + D	TOTAL
Ground Floor	-	-	-	-	-
Second Floor	8	4	3	2	17
Third Floor	4	4	3	4	15
Forth Floor	4	4	3	4	15
Fifth Floor	4	4	3	4	15
Sixth Floor	4	4	3	4	15
Seventh Floor	4	4	3	4	15
Eighth Floor	4	4	3	4	15
Ninth Floor	4	4	3	4	15
Tenth Floor	3	2	2	1	8
Eleventh Floor	3	4	2	1	10
TOTAL UNITS:	42	38	28	32	140
PERCENTAGE:	30%	27%	20%	23%	100%

MSAi
MICHAEL SPAZIANI ARCHITECT INC
6 Helene Street N, Suite 100
Port Credit, Mississauga ON L5G 3B2
T 905 891 0691 F 905 891 0514



ONTARIO ASSOCIATION OF ARCHITECTS
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4		
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Better Life Retirement Residence Inc.
(c/o 2564905 Ontario Inc.)

PROJECT:
441 Maple Street

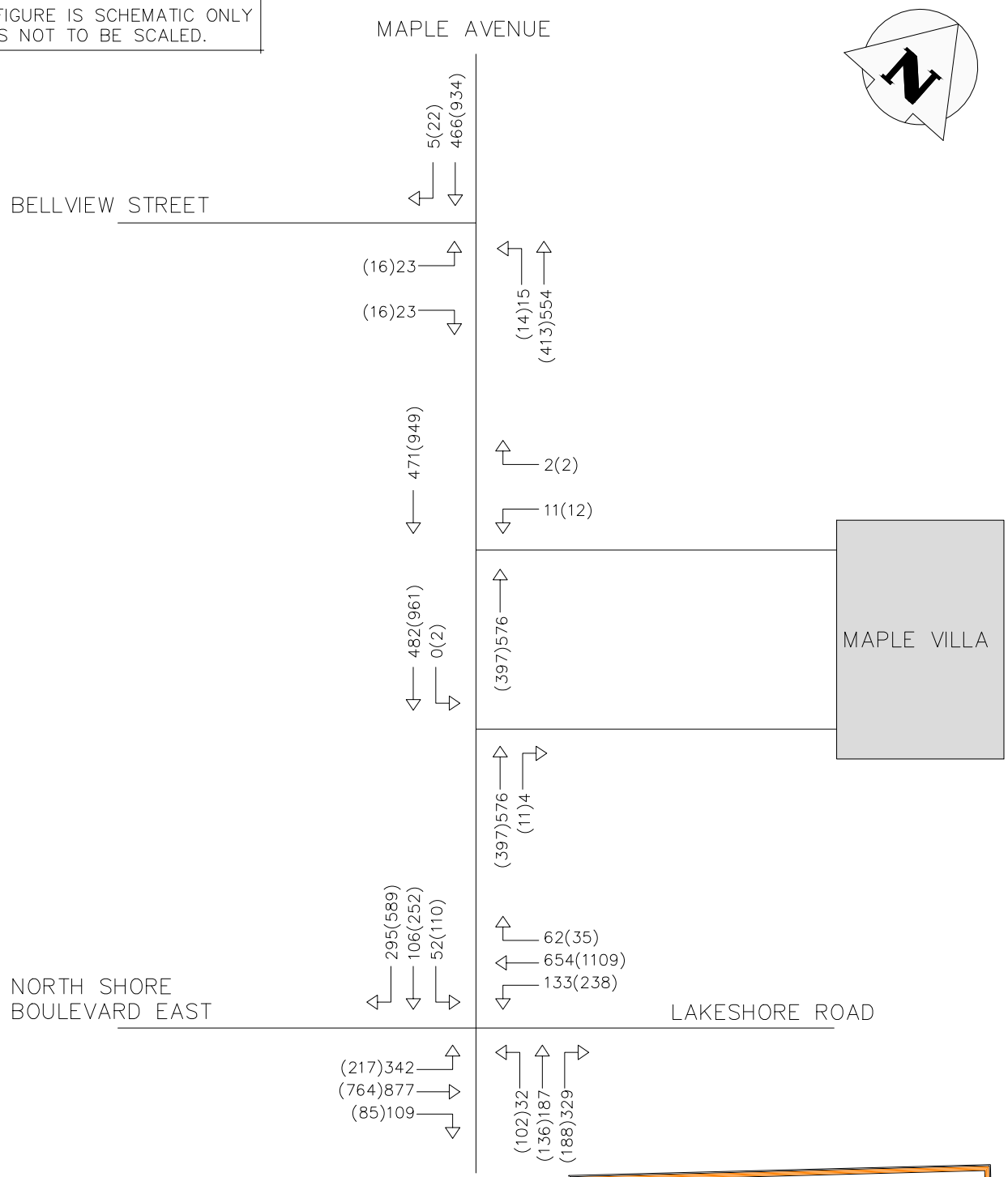
Burlington, ON

SHEET TITLE:
Proposed Site Plan

PROJECT NO.
C6075

SCALE:	DATE:
1:200	Nov, '18
DRAWN: msai	SHEET NO: SP1
CHECKED: ms	
FILE NO.	

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TRAFFIC IMPACT STUDY
441 MAPLE AVENUE
CITY OF BURLINGTON

EXISTING TRAFFIC VOLUMES

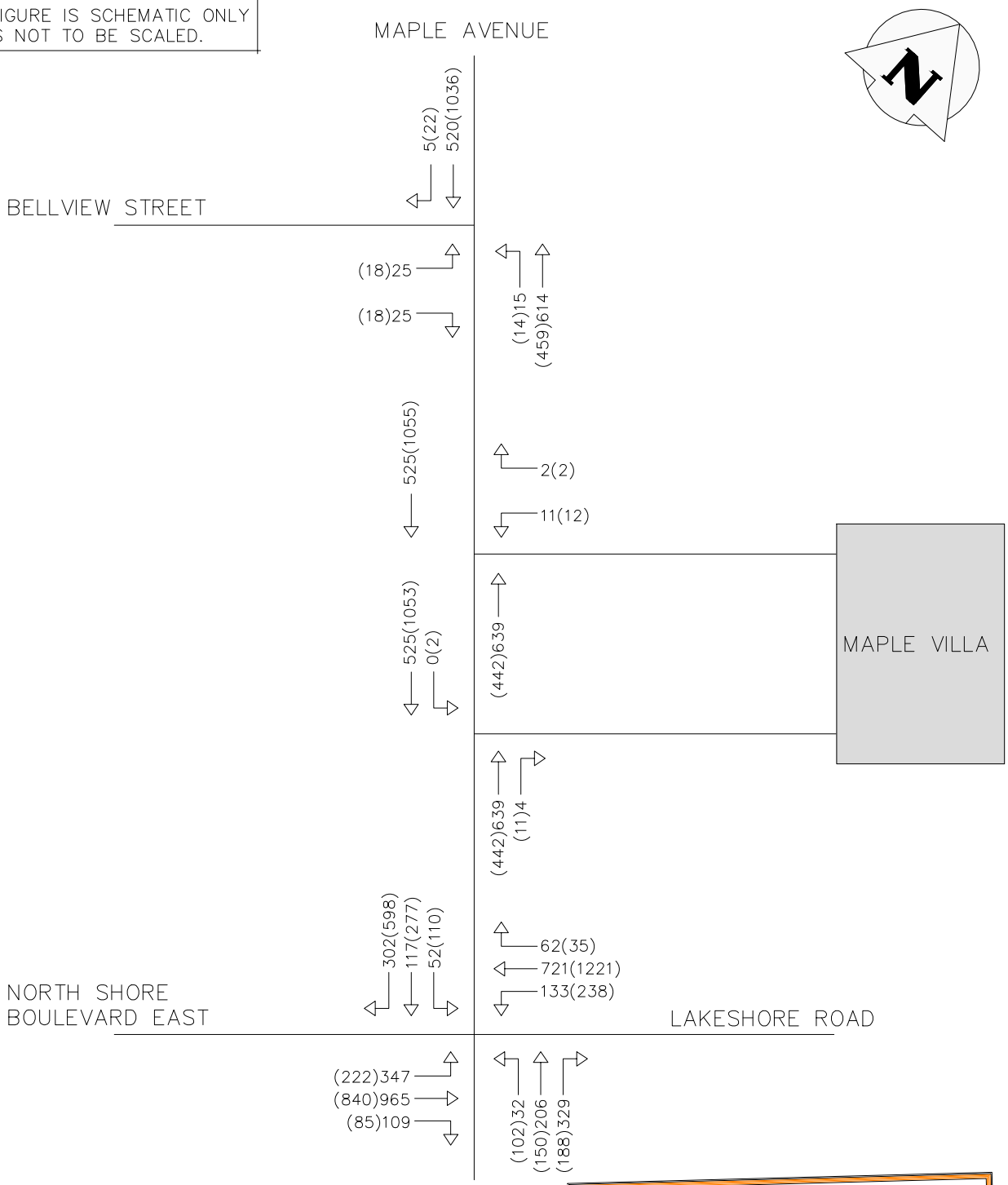
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TRAFFIC IMPACT STUDY
441 MAPLE AVENUE
CITY OF BURLINGTON

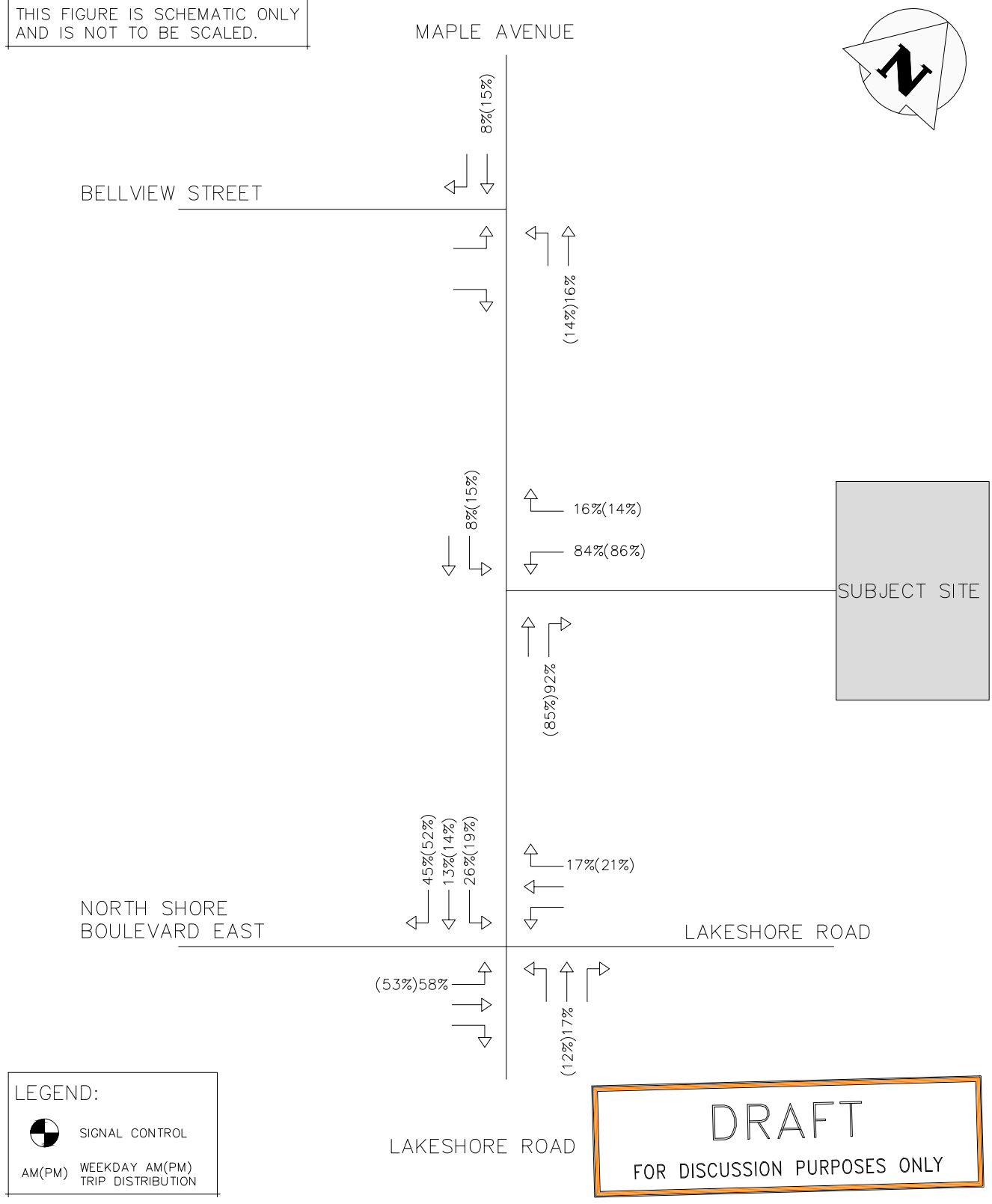
2025 FUTURE BACKGROUND TRAFFIC VOLUMES

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CITY OF BURLINGTON

SITE TRIP DISTRIBUTION

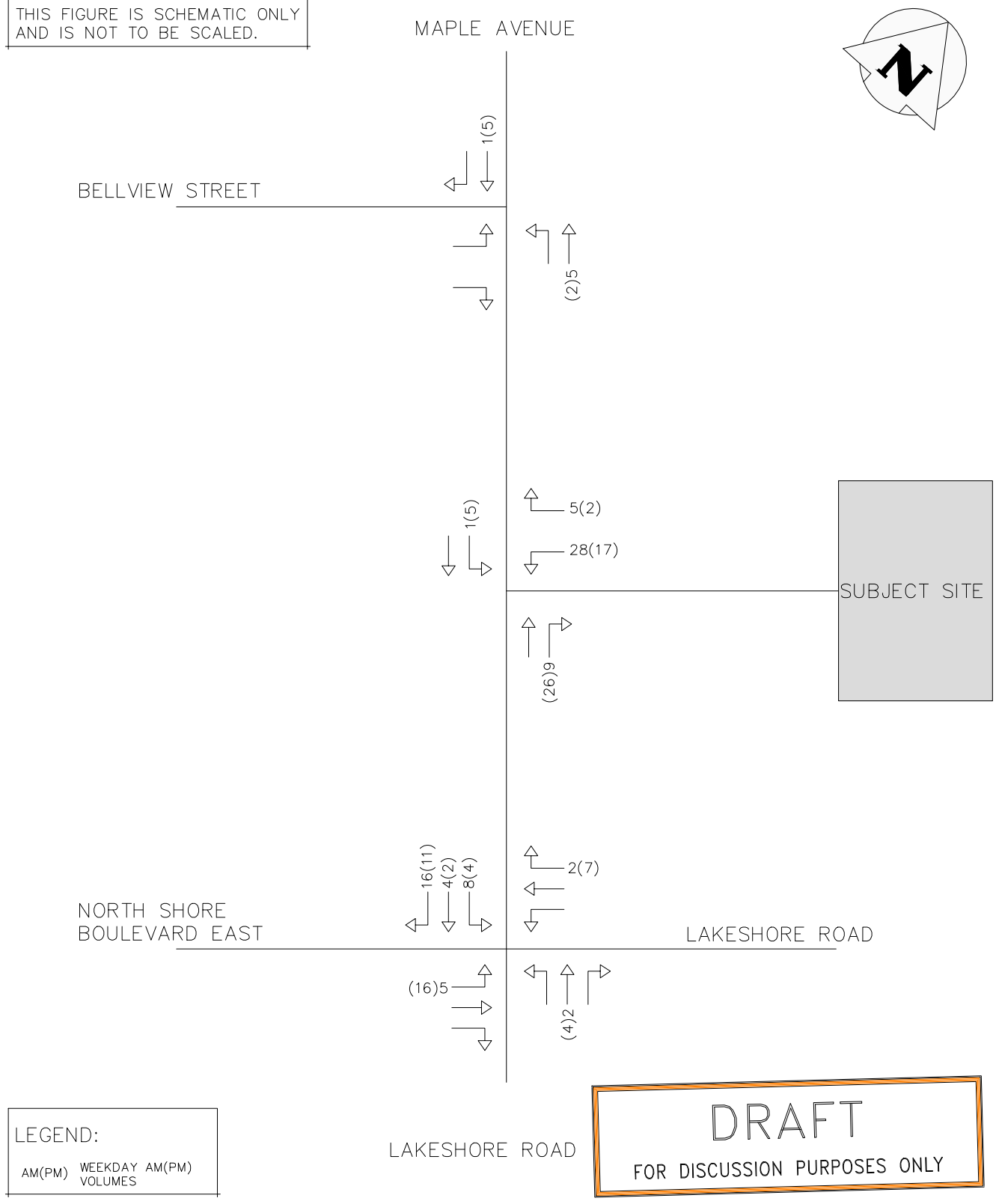
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A.W.		N.T.S	FIG. 04

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CITY OF BURLINGTON

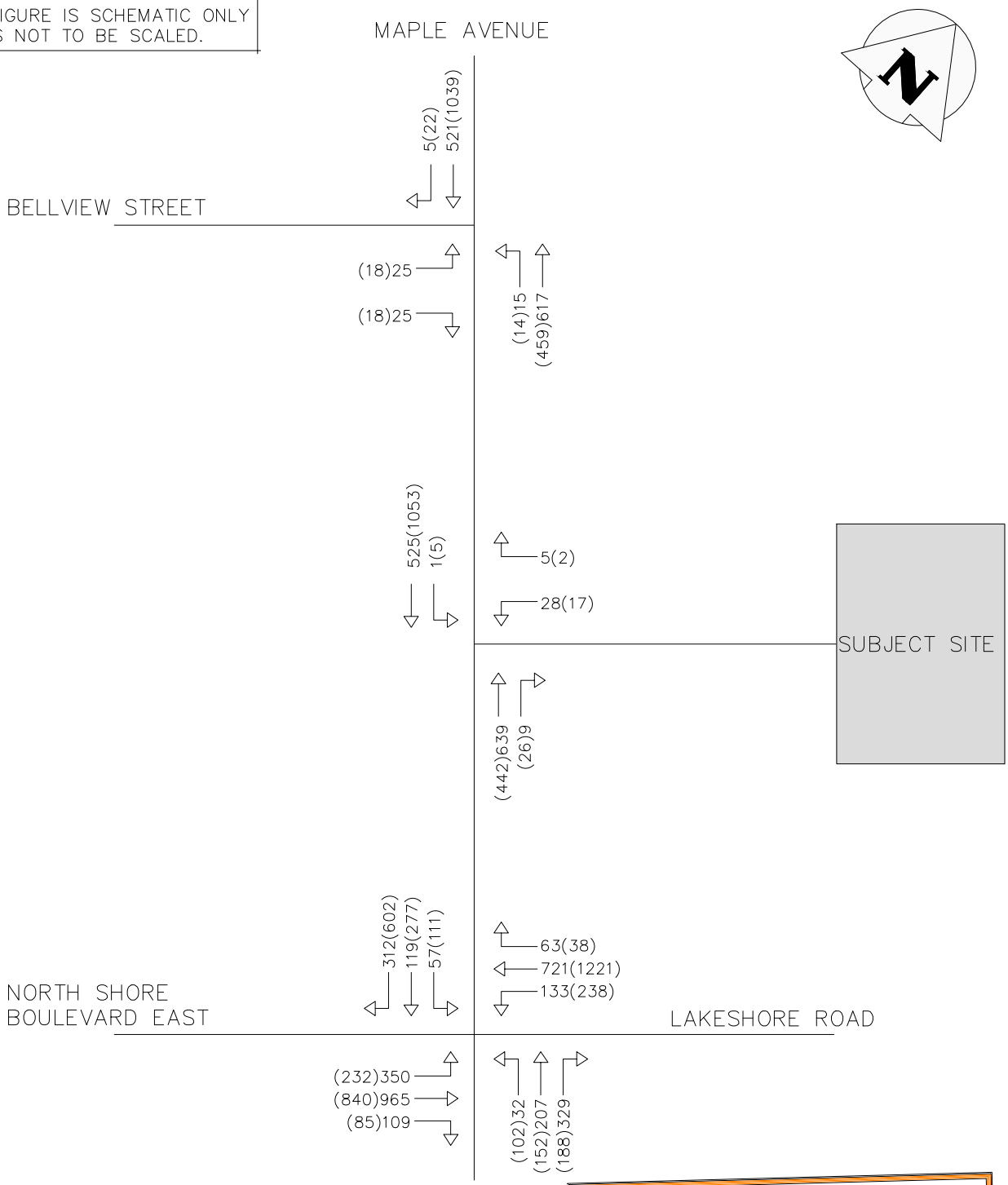
SITE TRIP ASSIGNMENT

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A.W.		N.T.S	FIG. 5

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A.W.		N.T.S	FIG. 06

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