TRAFFIC IMPACT STUDY

3171 LAKESHORE ROAD WEST
TOWN OF OAKVILLE,
REGIONAL MUNICIPALITY OF HALTON

OFFICIAL PLAN AMENDMENT,
ZONING BY-LAW AMENDMENT &
DRAFT PLAN OF SUBDIVISION

PREPARED FOR:
VOGUE WYCLIFFE (OAKVILLE) LIMITED

PREPARED BY:

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MILTON, ON
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ORIGINAL: DECEMBER 2017
CURRENT UPDATE: OCTOBER 2022

CFCA FILE NO. 1159-4614

CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev. 0	December 2017	First Submission
Rev. 1	July 2019	Second Submission – TIS Addendum to reflect updated development proposal
Rev. 2	February 2022	Third Submission – TIS Addendum to reflect updated development proposal
Rev. 3	October 2022	Fourth Submission – TIS Addendum to address minor Town comment

1.0 Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Vogue Wycliffe (Oakville) Limited to undertake a Traffic Impact Study (TIS) in support of the Official Plan Amendment, Zoning By-Law Amendment and Draft Plan of Subdivision application for a residential development located at 3171 Lakeshore Road West in the Town of Oakville. A Traffic Impact Study was prepared by Crozier in December 2017 and concluded that the development proposal for 22 single-family detached dwelling units is supportable from a traffic operations perspective. Further, an Addendum was prepared in July 2019 to reflect an updated development proposal.

Given the change in site plan from the July 2019 Traffic Study, the TIS Addendum (February 2022) assessed the traffic impacts associated with the most current site plan proposal. The new development proposal includes 8 semi-detached dwelling units and 27 dual frontage townhomes. The new development proposal includes an internal roadway that connects to Lakeshore Road West at the approximate location of West Street. The site (30 units) will be served via the connection at Lakeshore Road; only the 5 units fronting the Victoria Street cul-de-sac will use Victoria Street. The condo-Road connection to the Victoria Street cul-de-sac will include retractable bollards for emergency access only. This TIS addresses a minor Town comment regarding the last submission.

The proposed development is forecast to generate 18 and 24 total two-way trips during the weekday a.m. and p.m. peak hours, respectively. This corresponds to 15 and 20 total two-way trips through the Lakeshore Road West main site access, and 3 and 4 total two-way trips through the Victoria Street minor site access.

Considering the projected trips and travel routes, this TIS Addendum analyzes the Lakeshore Road West and West Street / Site Access as the sole study intersection. Turning movement counts were conducted by Spectrum Traffic at the study intersection on Tuesday June 29, 2021, between 6:00 a.m. - 10:00 a.m. and 3:00 p.m. - 7:00 p.m. The stop-controlled study intersection (West Street and site access connections to Lakeshore Road) is operating satisfactorily under existing conditions at a level of service (LOS) "C" with all movements below capacity and no 95th percentile queueing issues.

As requested by the Town of Oakville in the previous submissions, a five year horizon (i.e., 2026) and a compounded growth rate of 1% per annum was incorporated herein.

The stop-controlled West Street and site access connections to Lakeshore Road is expected to continue operating below capacity under 2026 future background conditions at a LOS "D" or better during the a.m. and p.m. peak hours. No queueing issues are forecast.

Site traffic from both the main site access opposite to West Street and the Victoria Street minor access were considered to project future total traffic at the study intersection. Under 2026 future total conditions, the stop controlled intersection of Lakeshore Road West and West Street / the proposed site access is expected to operate at a LOS "D" and "F" during the a.m. and p.m. peak hours, respectively. Delays of up 50.6 seconds and no queueing issues are forecast during the peak hours.

The Condo Road (site access) connection to Lakeshore Road West will be at the approximate location of the easterly access to the existing Garden Centre, therefore, similar to the existing access and the West Street connection, no safety issues related to sightlines is forecast.

In conclusion, the proposed development can be supported from a traffic operations perspective as the site's traffic is forecast to be accommodated by the boundary road network and. Any minor changes to the Site Plan will not materially affect the conclusions contained within this report.

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2.0 Introduction

2.1 Background

C.F. Crozier & Associates Inc. (Crozier) was retained by Vogue Wycliffe (Oakville) Limited to undertake a Traffic Impact Study (TIS) in support of the Official Plan Amendment, Zoning By-Law Amendment and Draft Plan of Subdivision application for a residential development located at 3171 Lakeshore Road West in the Town of Oakville.

A Traffic Impact Study was prepared by Crozier in December 2017 and concluded that the development proposal for 22 single-family detached dwelling units is supportable from a traffic operations perspective. Further, an Addendum was prepared in July 2019 to reflect an updated development proposal. Given the change in site plan from the July 2019 Traffic Study, the TIS Addendum (February 2022) assessed the traffic impacts associated with the most current site plan proposal presented herein. This TIS update addresses a minor Town comment regarding the last TIS submission.

2.2 Development Proposal

Per the Site Plan prepared by VA3 Design Inc. (dated January 19, 2022), the new development proposal includes 8 semi-detached dwelling units and 27 dual frontage townhomes. Of the 35 total dwelling units, 30 dwelling units will front an internal condo roadway that is proposed to connect to the existing road network at the Lakeshore Road West and West Street intersection. Furthermore, 5 dwelling units will front a northern extension of Victoria Street which ends in a cul-de-sac south of the subject land. As the new access configuration has shifted the main site access onto Lakeshore Road West, a Traffic Impact Study Addendum became required to address the traffic related impacts of the proposed changes. **Figure 1** illustrates the Site Plan.

The previous development proposal in 2017 consisted of 25 single-detached dwelling units with adjoining lands considered and the extension of Victoria Street to connect the segments east and west of the subject property. The development proposal in 2019 consisted of the same site statistics as the current development proposal (27 townhomes and 8 semi-detached dwelling units), with a single site access servicing the entire development at Victoria Street (southern segment). These previous site plans are no longer being pursued.

2.3 Purpose and Scope

The purpose of the study is to evaluate the transportation-related impacts of the proposed development on the boundary road network and to recommend any required mitigation measures, if warranted.

The study reviews the following main aspects of the proposed development from a transportation engineering perspective:

- Existing, future background, and future total traffic operations on the boundary road network during the weekday a.m. and p.m. peak hours;
- Forecasted trip generation and distribution of the proposed development;
- Mitigation measures to support the proposed development, if required;
- Warrants Assessment on the need for intersection signalization

The study has been completed in accordance with the procedures set out in the Region of Halton's "Transportation Impact Study Guidelines" (January 2015). The scope of work in this Addendum is similar to the scope of work in the previous study and the 2019 Addendum, which was based on confirmed Terms of Reference with Town of Oakville staff via correspondence (Phone call, Syed Rizvi/Alexander Fleming, May 10, 2017).

3.0 Existing Conditions

3.1 Development Lands

The subject property covers an area of approximately 1.00 ha. A Garden Centre currently exists on the subject lands with two existing accesses to Lakeshore Road West. The subject property is zoned as RL3-0 and RL8 "Residential Low" per Town of Oakville Zoning By-Law 2014-014. **Appendix A** contains the zoning information for the subject property.

The subject property is bound by existing residential developments to the north, Lakeshore Road West to the east, existing residential developments to the south and the existing Victoria Street alignment to the west. **Figure 2** illustrates the site location.

3.2 Study Intersections

Given the new development proposal, As previously noted in **Section 2.2**, the revised site plan now calls for a site access connection to Lakeshore Road West at West Street serving the majority of the dwelling units (30 units), with 5 dwelling units being serviced by Victoria Street. Therefore, the Lakeshore Road West and West Street / Site Access intersection was analyzed.

Study intersections pertaining to the Victoria Street were not analyzed due to the immaterial trip generation from the 5 units fronting the cul-de-sac (refer to **Section 5.1**).

3.3 Boundary Road Network

Lakeshore Road West is an east-west minor arterial roadway with an urban cross-section. At the study intersection, however, the road travels north-south and has been designated as such for the purposes of Synchro analysis. Lakeshore Road West is under the jurisdiction of the Town of Oakville with a posted speed limit of 50 km/h. The roadway consists of two travel lanes and a two-way left-turn lane (TWLTL). Bicycle lanes exist on both sides of the roadway, separated from the travel lanes by a solid white line. An approximate 2.0 metre concrete sidewalk exists directly adjacent to the north side of the roadway. An approximate 1.5 metre concrete sidewalk exists on the south side of the roadway, separated by an in-grass boulevard.

West Street is a north-south local roadway running perpendicular to Lakeshore Road West. West Street is under the jurisdiction of the Town of Oakville with an assumed speed limit of 50 km/h per municipal regulation. The roadway consists of two travel lanes. The roadway possesses gravel shoulders that permits on-street parking along the roadway. No bike lanes or sidewalks are located along the length of the street. The roadway was modelled as east-west for the purposes of Synchro analysis.

The sole study intersection of Lakeshore Road West and West Street is stop controlled on the minor approach only (West Street). The north and south Lakeshore Road West approaches possess a left turn lane via the two-way left-turn lane, along with a shared through and right-turn lane. The West Street east approach has a single shared lane for left, right and through movements. Finally, the

existing Garden centre site access has a single shared lane for left, right and through movements.

3.4 Transit Operations

Oakville Transit operates Bus Route 14 (Lakeshore Road West) within the study area. The route connects GO Appleby to GO Oakville and spans east-west on Lakeshore Road West. The route operates from Monday to Sunday with peak hour transit headways of 30 minutes during the weekday. There are bus stops located at the north-east and south-west corners of the intersection of Lakeshore Road West and Chalmers Street. **Appendix B** contains relevant transit information.

3.5 Traffic Data

As no turning movement counts (TMC's) were available from the Town of Oakville, TMC's were commissioned and conducted by Spectrum Traffic staff at the study intersection on Tuesday June 30, 2021, between 6:00 a.m. - 10:00 a.m. and 3:00 p.m. - 7:00 p.m. These time periods are reflective of commuter peak hours and thus were considered appropriate for traffic analysis of the proposed development.

Intersection analysis was conducted utilizing peak hour factors (PHFs) as calculated for each intersection approach. For the Lakeshore Road West approaches, the PHFs were calculated directly, while for the minor approaches, a peak hour factor of 0.85 was assigned and assumed to be sufficient.

The traffic count data and signal timing plans are contained in **Appendix C**. PHFs as calculated for the Lakeshore Road approaches are included in the traffic count data. **Figure 3** illustrates the 2021 existing traffic volumes.

3.6 Traffic Modelling

The boundary road network was modelled in Synchro 9.2 using existing roadway geometrics, collected traffic data and signal timings from the provided timing plans. For the purposes of the model, the two-way left-turn lane was modelled as a standard left turn lane at the study intersection.

The results for signalized intersection operations were derived from Synchro. The results for unsignalized intersection operations were derived using HCM2000 methodology. 95th percentile queue lengths were derived from Synchro.

Intersections are assessed using a Level of Service (LOS) metric with ranges of delay assigned a letter from "A" to "F"; "A" representing low delays and "F" representing heavy delays. The LOS definitions for signalized and unsignalized intersections are included in **Appendix D.**

3.7 Intersection Operations

The existing intersection operations at the study intersections were analyzed using the existing traffic volumes illustrated in **Figure 3.** Detailed capacity analysis worksheets are included in **Appendix E**.

Table 1 outlines the 2021 existing traffic operations.

Table 1: 2021 Existing Traffic Operations

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical v/c ratio [2]	95th Percentile Queue Length > Storage Length[1]
Lakeshore Road West and West Street	Stop (Minor Street)	A.M.	C	21.5 s	0.50 (NBTR)	None
		P.M.	C	23.7 s	0.65 (SBTR)	None

Note 1: The Level of Service of a unsignalized intersection is based on the critical control delay per approach. The 95th percentile queue lengths were derived from Sim-Traffic reports using 3 minute seeding, 10-minute simulation and an average of 5 runs.

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection where the maximum v/c ratio does not exceed the critical thresholds. All v/c ratios for through or shared through/turning movements exceeding 0.85 and all v/c ratios for exclusive turning movements exceeding 0.95 are listed and highlighted per the Region's TIS Guidelines.

The stop-controlled intersection of Lakeshore Road West and West Street is operating below capacity at a LOS "C" during the weekday a.m. and p.m. peak hours. A maximum control delay of 23.7 seconds (westbound movements) and volume-to-capacity ratio of 0.65 in the p.m. peak hour. These operations indicate that there is reserve capacity on the boundary road network for future traffic growth.

4.0 Future Background Conditions

4.1 Horizon Years

Per the Region's Transportation Impact Study guidelines, horizon years consisting of five years and potentially ten years from the date of full build-out must be analyzed. The year of full build-out is unknown but it is expected to occur on a short-term scale (ie. within two years).

The previous studies separately analyzed the 2022 and 2024 horizon years to reflect a five-year horizon from the date of study (2017 TIS, 2019 TIS Addendum). For consistency, the five-year horizon from the date of study was analyzed in this Addendum. Therefore, the 2026 horizon year was analyzed.

4.2 Growth Rate

Crozier was advised by Town of Oakville staff to apply a compounded growth rate of 1% per annum to existing traffic volumes in the original study. For consistency, this growth rate was applied in this Addendum.

4.3 Intersection Operations

The 2026 future background intersection operations at the study intersections were analyzed using the 2026 future background traffic volumes illustrated in **Figure 4**. Detailed capacity analysis worksheets are included in **Appendix E**. **Table 2** outlines the 2026 future background traffic operations.

Table 2: 2026 Future Background Traffic Operations

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical v/c ratio [2]	95th Percentile Queue Length > Storage Length[1]
Lakeshore Road West and West Street	Stop (Minor Street)	A.M.	C	23.0 s	0.53 (NBTR)	None
		P.M.	D	25.9 s	0.63 (SBTR)	None

Note 1: The Level of Service of a unsignalized intersection is based on the critical control delay per approach. The 95th percentile queue lengths were derived from Sim-Traffic reports using 3 minute seeding, 10-minute simulation and an average of 5 runs.

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection where the maximum v/c ratio does not exceed the critical thresholds. All v/c ratios for through or shared through/turning movements exceeding 0.85 and all v/c ratios for exclusive turning movements exceeding 0.95 are listed and highlighted per the Region's TIS Guidelines.

The stop-controlled minor intersection of Lakeshore Road West and West Street is projected to operate below capacity at a LOS "D" or better during the weekday a.m. and p.m. peak hours. A maximum control delay of 25.9 seconds (westbound movements) and volume-to-capacity ratio of 0.63 in the p.m. peak hour.

5.0 Site Generated Traffic

The proposed development will result in additional vehicles on the boundary road network that would otherwise not exist. The proposed development will also result in additional turning movements at the study intersections. Further, the proposed development will remove existing traffic movements from the garden centre. This section analyzes each of these elements to arrive at a net trip assignment that can be added to the future background scenario.

5.1 Trip Generation

Trip generation for the proposed development was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, which has been released since the preparation of the previous Traffic Impact Study. The ITE Trip Generation Manual is a compendium of industry collected trip generation data across North America for a variety of land uses and is used industry-wide as a source for trip generation forecasts.

Land Use Category (LUC) 220 "Multifamily Housing (Low-Rise)" was applied all 35 dwelling units. Trip generation based on the fitted curve equation methodology were higher and adopted herein to be conservative.

As previously discussed in **Section 2.2**, 30 of the dwelling units are proposed to be serviced by a site access off of Lakeshore Road West, while 5 dwelling units are proposed to be serviced by an extension of the southern segment of Victoria Street. Thus, separate trip generations for each portion of the development have been provided.

Table 3 outlines the trip generation for the proposed development.

Table 3: Trip Generation

Development Access	ITE Land Use Category	Units	Peak Hour	Trips Generated		
				Inbound	Outbound	Total
Condo Road at Lakeshore Road West/ West Street	LUC 220 "Multifamily Housing (Low-Rise)"	30	A.M.	3	12	15
			P.M.	13	7	20
Victoria Street		5	A.M.	1	2	3
			P.M.	3	1	4
Total Development Trip Generation		**35**	**A.M.**	**4**	**14**	**18**
			P.M.	**16**	**8**	**24**

The proposed development is expected to generate 18 and 24 total two-way trips during the weekday a.m. and p.m. peak hours, respectively. Given the sole residential land use, no internal synergy trips or pass-by trips are expected for the proposed development.

As part of the proposed development, the existing garden centre will be removed. Thus, the traffic associated with the current Garden centre must be removed from the study intersection. Thus, the traffic movements associated with the site access west approach were removed from the 2026 Total Traffic scenario as these trips originate from the garden centre.

5.2 Trip Distribution and Assignment

The trips generated by the development were distributed to the boundary roadways in the previous Traffic Impact Study Addendum based on 2016 Transportation Tomorrow Survey (TTS) data. TTS is a comprehensive survey of transportation characteristics of households in the Greater Toronto Area (GTA) and surrounding areas.

TTS results were filtered to reflect auto trips exiting from the 2006 GTA zone that the subject property is currently located in (4001) between 7:00 a.m. - 10:00 a.m. The zone is residential in nature, and thus the TTS results will be appropriate for the proposed residential development. Trip distribution was determined based on the most convenient route of travel between each origin-destination pair. Refer to **Appendix F** for the TTS data.

The resulting trip distribution is as follows:

- 75% to the east (e.g., Toronto, Mississauga, Oakville, etc.)
- 5% to the north (e.g., Milton, etc.)
- 20% to the west (e.g., Burlington, Hamilton, etc.)

Trips arriving from and departing to the east are expected to do so via Lakeshore Road West, where they will either use the Queen Elizabeth Way (QEW) via Bronte Road or continue on Lakeshore Road West. Trips arriving from and departing to the north are expected to do so via Lakeshore Road West and Bronte Road. Trips arriving from and departing to the west are expected to do so via Lakeshore Road West (towards Burlington) or the QEW. Trips utilizing the QEW would be expected to access the highway from the site via Lakeshore Road West and Great Lakes Boulevard / Burloak Drive.

As previously outlined, the proposed development is expected to generate 3 and 4 total two-way trips via Victoria Street during the weekday a.m. and p.m. peak period, respectively. These trip generation forecasts are negligible from a traffic operations perspective and are typically not associated with traffic operational issues nor external roadway improvements. Nevertheless, to forecast worst-case

traffic operations, these vehicle movements were introduced to the study intersection as southbound and northbound through movements travelling to and from the minor site access, respectively.

Considering the above, the trip distributions at the study intersection of the Condo Road at Lakeshore Road West / West Street are presented in **Figure 5** and the site trip assignment is shown in **Figure 6.**

6.0 Future Total Conditions

6.1 Basis of Assessment

The traffic impacts arising from the proposed development were assessed based on the site generated traffic illustrated in **Figure 6.** The resulting total traffic volumes for the weekday a.m. and p.m. peak hours are illustrated in **Figure 7**.

6.2 Intersection Operations

The 2026 future total intersection operations at the study intersections were analyzed using the 2026 future total traffic volumes illustrated in **Figure 7**. Detailed capacity analysis worksheets are included in **Appendix E**.

Table 4 outlines the 2026 future background traffic operations.

Table 4: 2026 Future Total Traffic Operations

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical v/c ratio [2]	95th Percentile Queue Length > Storage Length [1]
Lakeshore Road West and West Street	Stop (Minor Street)	A.M.	D	29.6 s (EBLTR)	0.53 (NBTR)	None
		P.M.	F	50.6 s (EBLTR)	0.64 (SBTR)	None

Note 1: The Level of Service of a unsignalized intersection is based on the critical control delay per approach. The 95th percentile queue lengths were derived from Sim-Traffic reports using 3 minute seeding, 10-minute simulation and an average of 5 runs.

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection where the maximum v/c ratio does not exceed the critical thresholds. All v/c ratios for through or shared through/turning movements exceeding 0.85 and all v/c ratios for exclusive turning movements exceeding 0.95 are listed and highlighted per the Region's TIS Guidelines.

The boundary road network is expected to operate at a LOS "F" during the weekday p.m. peak hour under 2026 future total conditions for the stop-controlled minor access connection to Lakeshore Road, but no critical volume-to-capacity ratios or 95th percentile queue lengths is projected. A maximum control delay of 50.6 seconds is expected at the site access during the p.m. peak period. The forecasted control delay is typical for stop-controlled connections during peak hours and traffic is expected to operate with minimal delays to the minor connections outside the peaks.

To further assess the adequacy of the existing stop control in the future study horizon, a warrants assessment was conducted to determine if the intersection warrants traffic signalization. The results of the warrants assessment are discussed in **Section 7.0**.

The Condo Road connection to Lakeshore Road West will be at the approximate location of the easterly access to the existing Garden Centre, forming a fourth leg at the Lakeshore Road/ West Street

intersection, therefore, similar to the existing access and the West Street connection, no safety issues related to sightlines is forecast.

As aforementioned in Section 5, only a maximum of 4 trips is forecast to use Victoria Street during the peak hours, as such, operations of the intersections of Chalmers Street with Victoria Street and Lakeshore Road are expected to remain at a LOS "A" per the findings of the TIS (dated July 2019). That TIS was based on the older site plan with all site traffic using Victoria Street, therefore, operations should further be better than previously forecasted. Refer to **Appendix H** for the subject TIS excerpts.

7.0 Warrants Assessment

Traffic signal warrant analysis was conducted using an Ontario Traffic Manual (OTM) Book 12 configured excel sheet based on the average hourly volume approach. Traffic signals were found to be not warranted at the study intersection of Lakeshore Road and West Street under the study horizons. The traffic signal control warrant results for the critical study intersections under the 2026 total traffic volumes scenario are presented in **Appendix G**. Additionally, given the low volumes at the site access, no left turn lanes are warranted at the proposed site accesses.

8.0 Conclusions

The analysis contained within this report has resulted in the following key findings:

- Analysis of 2021 existing traffic conditions indicate that the study intersection (stop-controlled West Street and site access connections to Lakeshore Road) operates at LOS "C" or better during the weekday a.m. and p.m. peak hour.
- The stop-controlled West Street and site access connections to Lakeshore Road is expected to continue operating satisfactorily under 2026 future background conditions. The intersection is forecast to operate below capacity at a LOS "C" and "D" during the a.m. and p.m. peak hours, respectively. No queueing issues are forecast.
- The proposed development is forecast to generate 18 and 24 total two-way trips during the weekday a.m. and p.m. peak hours, respectively. This corresponds to 15 and 20 total two-way trips through the Lakeshore Road West main site access, and 3 and 4 total two-way trips through the Victoria Street minor site access.
- Under 2026 Total Traffic, the stop-controlled West Street and site access connections to Lakeshore Road are expected to operate at a LOS "D" and "F" during the a.m. and p.m. peak hours, respectively. Delays of up 50.6 seconds and no queueing issues are forecasted.
- Based on the signal warrant analysis, traffic signals are not warranted at the study intersection of Lakeshore Road and West Street/ site access under the study horizons.
- The Condo Road (site access) connection to Lakeshore Road West will be at the approximate location of the easterly access to the existing Garden Centre, therefore, similar to the existing access and the West Street connection, no safety issues related to sightlines are forecast.
- Though no material impact from the site is forecast for the Victoria Street intersections due to insignificant trips; it is noted that Chalmers Street with Victoria Street and Lakeshore Road are expected to remain at a LOS "A" similar to the findings of the TIS (dated July 2019) – excerpts included in Appendix H.

In conclusion, the proposed development can be supported from a traffic operations perspective as the site's traffic is forecast to be accommodated by the boundary road network and. Any minor changes to the Site Plan will not materially affect the conclusions contained within this report.

Respectfully submitted by,

C.F. CROZIER & ASSOCIATES INC.

Peter Apasnore, MASc., P.Eng., PTOE
Project Manager

/AH/MI

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APPENDIX A

Town of Oakville Zoning By-Law 2014-014 Excerpts

Consolidated to January 27, 2017

ZONING BOUNDARY

TOWN OF OAKVILLE

Zoning By-law 2014-014

Community Development Commission
Strategic Business Support

0 150 300 450 600 750 Meters

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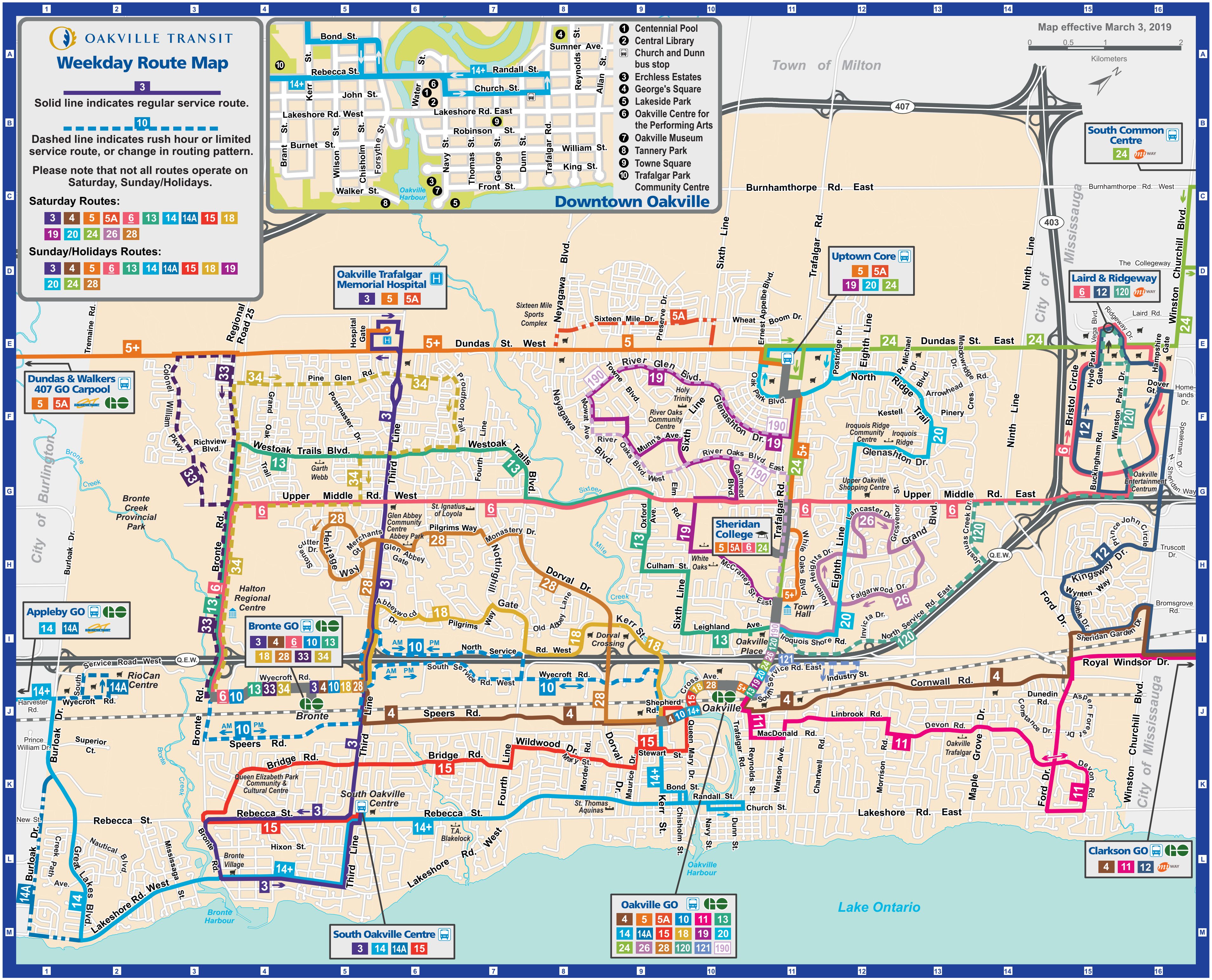
APPENDIX B

Transit Data



OAKVILLE TRANSIT
Weekday Route Map
Solid line indicates regular service route.
Dashed line indicates rush hour or limited service route, or change in routing pattern.
Please note that not all routes operate on Saturday, Sunday/Holidays.
Saturday Routes:
3 4 5 5A 6 13 14 14A 15 18 19 20 24 26 28
Sunday/Holidays Routes:
3 4 5 6 13 14 14A 15 18 19 20 24 28
Downtown Oakville
1 Centennial Pool
2 Central Library
Church and Dunn bus stop
3 Erchless Estates
4 George's Square
5 Lakeside Park
6 Oakville Centre for the Performing Arts
7 Oakville Museum
8 Tannery Park
9 Towne Square
10 Trafalgar Park Community Centre
Map effective March 3, 2019
Kilometers
Town of Milton
City of Mississauga
City of Burlington
South Common Centre
24
Uptown Core
5 5A 19 20 24
Laird & Ridgeway
6 12 120
Oakville Trafalgar Memorial Hospital
3 5 5A
Dundas & Walkers 407 GO Carpool
5 5A
Appleby GO
14 14A
Bronte GO
3 4 6 10 13 18 28 33 34
Sheridan College
5 5A 6 24
Clarkson GO
4 11 12
Oakville GO
4 5 5A 10 11 13 14 14A 15 18 19 20 24 26 28 120 121 190
South Oakville Centre
3 14 14A 15
Dundas St. West
Dundas St. East
Upper Middle Rd. West
Upper Middle Rd. East
Burnhamthorpe Rd. East
Westoak Trails Blvd.
River Glen Blvd.
Speers Rd.
Cornwall Rd.
Rebecca St.
Lakeshore Rd. West
Lakeshore Rd. East
Royal Windsor Dr.
Wyecroft Rd.
North Service Rd. West
South Service Rd. West
Bronte Rd.
Third Line
Trafalgar Rd.
Sixth Line
Eighth Line
Ninth Line
Winston Churchill Blvd.
Bronte Creek Provincial Park
Halton Regional Centre
Lake Ontario
Bronte Harbour
Oakville Harbour

Oakville Transit service schedules

Effective June 27, 2021 until further notice

14 14A Lakeshore West

See next page for schedules toward Appleby GO.

14 14A Oakville GO

Timepoint	Route	Appleby GO (Depart)	Harvester & Appleby	Harvester & Burloak	RioCan Centre	Burloak & New	Great Lakes & Rebecca	Lakeshore & Great Lakes	Lakeshore & Bronte	South Oakville Centre (Ar.)	South Oakville Centre (Dp.)	Rebecca & Kerr	Church & Dunn	Bond & Kerr	Oakville GO (Arrive)
Monday to Friday															
To Oakville GO – 14 via Great Lakes Blvd., 14A via Burloak Dr.															
a.m.	14A	--	--	--	--	--	--	--	--	--	--	--	5:52	5:56	6:05
	14	*This trip begins at Burloak & Prince William at 5:52 a.m.*					**5:54**	**5:57**	**6:00**	**6:07**	**6:12**	**6:19**	**6:25**	**6:29**	**6:38**
	14A	6:07	6:11	6:14	--	6:16	--	6:19	6:22	6:28	6:42	6:49	6:55	6:59	7:08
	14	**6:43**	**6:47**	**6:50**	**--**	**--**	**6:54**	**6:57**	**7:00**	**7:07**	**7:12**	**7:19**	**7:25**	**7:29**	**7:38**
	14A	7:13	7:17	7:20	--	7:23	--	7:27	7:30	7:37	7:42	7:49	7:55	7:59	8:08
	14	**7:43**	**7:47**	**7:50**	**--**	**--**	**7:54**	**7:57**	**8:00**	**8:07**	**8:12**	**8:19**	**8:25**	**8:29**	**8:38**
	14A	8:07	8:11	8:14	8:17	8:23	--	8:27	8:30	8:37	8:42	8:49	8:55	8:59	9:08
	14	**8:43**	**8:47**	**8:50**	**--**	**--**	**8:54**	**8:57**	**9:00**	**9:07**	**9:12**	**9:19**	**9:25**	**9:29**	**9:38**
	14A	9:07	9:11	9:14	9:17	9:23	--	9:27	9:30	9:37	9:42	9:49	9:55	9:59	10:08
	14	**9:43**	**9:47**	**9:50**	**--**	**--**	**9:54**	**9:57**	**10:00**	**10:07**	**10:12**	**10:19**	**10:25**	**10:29**	**10:38**
		and alternating – every 24/36 minutes			*every 60 minutes*			*every 30 minutes*							
p.m.	14A	5:07	5:11	5:14	5:17	5:23	--	5:27	5:30	5:37	5:42	5:49	5:55	5:59	6:08
	14	**5:43**	**5:47**	**5:50**	**--**	**--**	**5:54**	**5:57**	**6:00**	**6:07**	**6:12**	**6:19**	**6:25**	**6:29**	**6:38**
	14A	6:07	6:11	6:14	6:17	6:23	--	6:27	6:30	6:37	6:42	6:49	6:55	6:59	7:08
	14	**6:43**	**6:47**	**6:50**	**--**	**--**	**6:54**	**6:57**	**7:00**	**7:07**	**7:12**	**7:19**	**7:25**	**7:29**	**7:38**
	14A	7:07	7:11	7:14	7:17	7:23	--	7:27	7:30	7:37	7:42	7:49	7:55	7:59	8:08
	14	**7:43**	**7:47**	**7:50**	**--**	**--**	**7:54**	**7:57**	**8:00**	**8:07**	**8:12**	**8:19**	**8:25**	**8:29**	**8:38**
	14A	8:07	8:11	8:14	8:17	8:23	--	8:27	8:30	8:37	8:42	8:49	8:55	8:59	9:08
	14A	9:07	9:11	9:14	9:17	9:23	--	9:27	9:30	9:37	9:42	9:49	9:55	9:59	10:08
	14A	10:07	10:11	10:14	10:17	10:23	--	10:27	10:30	10:37	10:42	10:49	10:55	10:59	11:08
	14A	11:07	11:11	11:14	11:17	11:23	--	11:27	11:30	11:37	11:40	11:46	11:50	11:54	12:00
Saturday															
To Oakville GO – 14 via Great Lakes Blvd., 14A via Burloak Dr.															
a.m.	14A	--	--	--	--	--	--	--	--	--	--	--	6:55	6:59	7:08
	14	*This trip begins at Burloak & Prince William at 6:52 a.m.*					**6:54**	**6:57**	**7:00**	**7:07**	**7:12**	**7:19**	**7:25**	**7:29**	**7:38**
	14A	7:07	7:11	7:14	7:17	7:23	--	7:27	7:30	7:37	7:42	7:49	7:55	7:59	8:08
	14	**7:43**	**7:47**	**7:50**	**--**	**--**	**7:54**	**7:57**	**8:00**	**8:07**	**8:12**	**8:19**	**8:25**	**8:29**	**8:38**
	14A	8:07	8:11	8:14	8:17	8:23	--	8:27	8:30	8:37	8:42	8:49	8:55	8:59	9:08
	14	**8:43**	**8:47**	**8:50**	**--**	**--**	**8:54**	**8:57**	**9:00**	**9:07**	**9:12**	**9:19**	**9:25**	**9:29**	**9:38**
		and alternating – every 24/36 minutes			*every 60 minutes*			*every 30 minutes*							
p.m.	14A	6:07	6:11	6:14	6:17	6:23	--	6:27	6:30	6:37	6:42	6:49	6:55	6:59	7:08
	14	**6:43**	**6:47**	**6:50**	**--**	**--**	**6:54**	**6:57**	**7:00**	**7:07**	**7:12**	**7:19**	**7:25**	**7:29**	**7:38**
	14A	7:07	7:11	7:14	7:17	7:23	--	7:27	7:30	7:37	7:42	7:49	7:55	7:59	8:08
	14	**7:43**	**7:47**	**7:50**	**--**	**--**	**7:54**	**7:57**	**8:00**	**8:07**	**8:12**	**8:19**	**8:25**	**8:29**	**8:38**
	14A	8:07	8:11	8:14	8:17	8:23	--	8:27	8:30	8:37	8:42	8:49	8:55	8:59	9:08
	14A	9:07	9:11	9:14	9:17	9:23	--	9:27	9:30	9:37	9:42	9:49	9:55	9:59	10:08
	14A	10:07	10:11	10:14	10:17	10:23	--	10:27	10:30	10:37	10:42	10:49	10:55	10:59	11:08
	14A	11:07	11:11	11:14	11:17	11:23	--	11:27	11:30	11:37	11:40	11:46	11:50	11:54	12:00
Sunday / Holidays															
To Oakville GO – 14 via Great Lakes Blvd., 14A via Burloak Dr.															
a.m.	14A	--	--	--	--	--	--	--	--	--	--	--	7:55	7:59	8:08
	14	*This trip begins at Burloak & Prince William at 7:52 a.m.*					**7:54**	**7:57**	**8:00**	**8:07**	**8:12**	**8:19**	**8:25**	**8:29**	**8:38**
	14A	8:07	8:11	8:14	8:17	8:23	--	8:27	8:30	8:37	8:42	8:49	8:55	8:59	9:08
	14	**8:43**	**8:47**	**8:50**	**--**	**--**	**8:54**	**8:57**	**9:00**	**9:07**	**9:12**	**9:19**	**9:25**	**9:29**	**9:38**
	14A	9:07	9:11	9:14	9:17	9:23	--	9:27	9:30	9:37	9:42	9:49	9:55	9:59	10:08
	14	**9:43**	**9:47**	**9:50**	**--**	**--**	**9:54**	**9:57**	**10:00**	**10:07**	**10:12**	**10:19**	**10:25**	**10:29**	**10:38**

Oakville Transit service schedules

Effective June 27, 2021 until further notice

14 14A Lakeshore West

Timepoint	Route	Oakville GO (Depart)	Speers & Kerr	Church & Dunn	Rebecca & Kerr	South Oakville Centre (Ar.)	South Oakville Centre (Dp.)	Lakeshore & Bronte	Lakeshore & Great Lakes	Great Lakes & Rebecca	Burloak & Rebecca	RioCan Centre	Harvester & Burloak	Appleby GO (Arrive)
Monday to Friday														
	To Appleby GO – 14 via Great Lakes Blvd., 14A via Burloak Dr.													
a.m.	14A	6:05	6:08	6:17	6:20	6:28	6:37	6:44	6:47	--	6:51	--	6:55	7:04
	14	**6:40**	**6:44**	**6:53**	**6:56**	**7:04**	**7:07**	**7:14**	**7:17**	**7:20**	**--**	**--**	**7:24**	**7:33**
	14A	7:10	7:14	7:23	7:26	7:34	7:37	7:44	7:47	--	7:51	7:56	7:58	8:07
	14	**7:40**	**7:44**	**7:53**	**7:56**	**8:04**	**8:07**	**8:14**	**8:17**	**8:20**	**--**	**--**	**8:24**	**8:33**
	14A	8:10	8:14	8:23	8:26	8:34	8:37	8:44	8:47	--	8:51	8:56	8:58	9:07
	14	**8:40**	**8:44**	**8:53**	**8:56**	**9:04**	**9:07**	**9:14**	**9:17**	**9:20**	**--**	**--**	**9:24**	**9:33**
		and alternating – every 30 minutes								*every 60 minutes*			*every 26/34 min.*	
p.m.	14A	5:10	5:14	5:23	5:26	5:34	5:37	5:44	5:47	--	5:51	5:56	5:58	6:07
	14	**5:40**	**5:44**	**5:53**	**5:56**	**6:04**	**6:07**	**6:14**	**6:17**	**6:20**	**--**	**--**	**6:24**	**6:33**
	14A	6:10	6:14	6:23	6:26	6:34	6:37	6:44	6:47	--	6:51	6:56	6:58	7:07
	14	**6:40**	**6:44**	**6:53**	**6:56**	**7:04**	**7:07**	**7:14**	**7:17**	**7:20**	**--**	**--**	**7:24**	**7:33**
	14A	7:10	7:14	7:23	7:26	7:34	7:37	7:44	7:47	--	7:51	7:56	7:58	8:07
	14	**7:40**	**7:44**	**7:53**	**7:56**	**8:04**	**8:07**	**8:14**	**8:17**	**8:20**	**--**	**--**	**8:24**	**8:33**
	14A	8:10	8:14	8:23	8:26	8:34	8:37	8:44	8:47	--	8:51	8:56	8:58	9:07
	14A	9:10	9:14	9:23	9:26	9:34	9:37	9:44	9:47	--	9:51	9:56	9:58	10:07
	14A	10:10	10:14	10:23	10:26	10:34	10:37	10:44	10:47	--	10:51	10:56	10:58	11:07
	14A	11:40	11:44	11:53	11:56	12:04	12:04	12:11	12:14	--	12:18	*Ends at Burloak/Rebecca*		
Saturday														
	To Appleby GO – 14 via Great Lakes Blvd., 14A via Burloak Dr.													
a.m.	14A	7:10	7:14	7:23	7:26	7:34	7:37	7:44	7:47	--	7:51	7:56	7:58	8:07
	14	**7:40**	**7:44**	**7:53**	**7:56**	**8:04**	**8:07**	**8:14**	**8:17**	**8:20**	**--**	**--**	**8:24**	**8:33**
	14A	8:10	8:14	8:23	8:26	8:34	8:37	8:44	8:47	--	8:51	8:56	8:58	9:07
	14	**8:40**	**8:44**	**8:53**	**8:56**	**9:04**	**9:07**	**9:14**	**9:17**	**9:20**	**--**	**--**	**9:24**	**9:33**
		and alternating – every 30 minutes								*every 60 minutes*			*every 26/34 min.*	
p.m.	14A	6:10	6:14	6:23	6:26	6:34	6:37	6:44	6:47	--	6:51	6:56	6:58	7:07
	14	**6:40**	**6:44**	**6:53**	**6:56**	**7:04**	**7:07**	**7:14**	**7:17**	**7:20**	**--**	**--**	**7:24**	**7:33**
	14A	7:10	7:14	7:23	7:26	7:34	7:37	7:44	7:47	--	7:51	7:56	7:58	8:07
	14	**7:40**	**7:44**	**7:53**	**7:56**	**8:04**	**8:07**	**8:14**	**8:17**	**8:20**	**--**	**--**	**8:24**	**8:33**
	14A	8:10	8:14	8:23	8:26	8:34	8:37	8:44	8:47	--	8:51	8:56	8:58	9:07
	14A	9:10	9:14	9:23	9:26	9:34	9:37	9:44	9:47	--	9:51	9:56	9:58	10:07
	14A	10:10	10:14	10:23	10:26	10:34	10:37	10:44	10:47	--	10:51	10:56	10:58	11:07
	14A	11:40	11:44	11:53	11:56	12:04	12:04	12:11	12:14	--	12:18	*Ends at Burloak/Rebecca*		
Sunday / Holidays														
	To Appleby GO – 14 via Great Lakes Blvd., 14A via Burloak Dr.													
a.m.	14A	8:10	8:14	8:23	8:26	8:34	8:37	8:44	8:47	--	8:51	8:56	8:58	9:07
	14	**8:40**	**8:44**	**8:53**	**8:56**	**9:04**	**9:07**	**9:14**	**9:17**	**9:20**	**--**	**--**	**9:24**	**9:33**
	14A	9:10	9:14	9:23	9:26	9:34	9:37	9:44	9:47	--	9:51	9:56	9:58	10:07
	14	**9:40**	**9:44**	**9:53**	**9:56**	**10:04**	**10:07**	**10:14**	**10:17**	**10:20**	**--**	**--**	**10:24**	**10:33**
		and alternating – every 30 minutes								*every 60 minutes*			*every 26/34 min.*	
p.m.	**14**	**5:40**	**5:44**	**5:53**	**5:56**	**6:04**	**6:07**	**6:14**	**6:17**	**6:20**	**--**	**--**	**6:24**	**6:33**
	14A	6:10	6:14	6:23	6:26	6:34	6:37	6:44	6:47	--	6:51	6:56	6:58	7:07
	14	**6:40**	**6:44**	**6:53**	**6:56**	**7:04**	**7:07**	**7:14**	**7:17**	**7:20**	**--**	**--**	**7:24**	**7:33**
	14A	7:10	7:14	7:23	7:26	7:34	7:37	7:44	7:47	--	7:51	7:56	7:58	8:07

15 Bridge

Timepoint	Oakville GO (Depart)	Stewart & Kerr	Bridge & Fourth Line	Bridge & Third Line	Bronte & Rebecca	South Oakville Centre (Ar.)	South Oakville Centre (Dp.)	Bronte & Rebecca	Bridge & Third Line	Bridge & Fourth Line	Stewart & Kerr	Oakville GO (Arrive)
Monday to Friday												
	To South Oakville Centre						**To Oakville GO**					
a.m.	6:10	6:19	6:25	6:29	6:34	6:37	6:38	6:42	6:48	6:53	6:59	7:08
	7:10	7:19	7:25	7:29	7:34	7:37	7:38	7:42	7:48	7:53	7:59	8:08
	8:10	8:19	8:25	8:29	8:34	8:37	8:38	8:42	8:48	8:53	8:59	9:08
	9:10	9:19	9:25	9:29	9:34	9:37	9:38	9:42	9:48	9:53	9:59	10:08
	10:10	10:19	10:25	10:29	10:34	10:37	10:38	10:42	10:48	10:53	10:59	11:08
	11:10	11:19	11:25	11:29	11:34	11:37	11:38	11:42	11:48	11:53	11:59	12:08
p.m.	12:10	12:19	12:25	12:29	12:34	12:37	12:38	12:42	12:48	12:53	12:59	1:08
	1:10	1:19	1:25	1:29	1:34	1:37	1:38	1:42	1:48	1:53	1:59	2:08
	2:10	2:19	2:25	2:29	2:34	2:37	2:38	2:42	2:48	2:53	2:59	3:08
	3:10	3:19	3:25	3:29	3:34	3:37	3:38	3:42	3:48	3:53	3:59	4:08
	4:10	4:19	4:25	4:29	4:34	4:37	4:38	4:42	4:48	4:53	4:59	5:08
	5:10	5:19	5:25	5:29	5:34	5:37	5:38	5:42	5:48	5:53	5:59	6:08
	6:10	6:19	6:25	6:29	6:34	6:37	6:38	6:42	6:48	6:53	6:59	7:08
	7:10	7:19	7:25	7:29	7:34	7:37	7:38	7:42	7:48	7:53	7:59	8:08
	8:10	8:19	8:25	8:29	8:34	8:37	8:38	8:42	8:48	8:53	8:59	9:08

15 Bridge

Timepoint	Oakville GO (Depart)	Stewart & Kerr	Bridge & Fourth Line	Bridge & Third Line	Bronte & Rebecca	South Oakville Centre (Ar.)	South Oakville Centre (Dp.)	Bronte & Rebecca	Bridge & Third Line	Bridge & Fourth Line	Stewart & Kerr	Oakville GO (Arrive)
Saturday												
	To South Oakville Centre						**To Oakville GO**					
a.m.	--	--	--	--	--	--	7:08	7:12	7:18	7:23	7:29	7:38
	7:40	7:49	7:55	7:59	8:04	8:07	8:08	8:12	8:18	8:23	8:29	8:38
	8:40	8:49	8:55	8:59	9:04	9:07	9:08	9:12	9:18	9:23	9:29	9:38
	9:40	9:49	9:55	9:59	10:04	10:07	10:08	10:12	10:18	10:23	10:29	10:38
	10:40	10:49	10:55	10:59	11:04	11:07	11:08	11:12	11:18	11:23	11:29	11:38
	11:40	11:49	11:55	11:59	12:04	12:07	12:08	12:12	12:18	12:23	12:29	12:38
p.m.	12:40	12:49	12:55	12:59	1:04	1:07	1:08	1:12	1:18	1:23	1:29	1:38
	1:40	1:49	1:55	1:59	2:04	2:07	2:08	2:12	2:18	2:23	2:29	2:38
	2:40	2:49	2:55	2:59	3:04	3:07	3:08	3:12	3:18	3:23	3:29	3:38
	3:40	3:49	3:55	3:59	4:04	4:07	4:08	4:12	4:18	4:23	4:29	4:38
	4:40	4:49	4:55	4:59	5:04	5:07	5:08	5:12	5:18	5:23	5:29	5:38
	5:40	5:49	5:55	5:59	6:04	6:07	6:08	6:12	6:18	6:23	6:29	6:38
	6:40	6:49	6:55	6:59	7:04	7:07	7:08	7:12	7:18	7:23	7:29	7:38
	7:40	7:49	7:55	7:59	8:04	8:07	8:08	8:12	8:18	8:23	8:29	8:38
	8:40	8:49	8:55	8:59	9:04	9:07	9:08	9:12	9:18	9:23	9:29	9:38

APPENDIX C

Traffic Data

Spectrum

Turning Movement Count
Location Name: LAKESHORE RD W & WEST ST
Date: Tue, Jun 29, 2021 Deployment Lead: Theo Daglis

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (1 . LAKESHORE RD W & WEST ST)

Start Time	N Approach NORTH DRIVEWAY						E Approach LAKESHORE RD W						S Approach WEST ST						W Approach LAKESHORE RD W						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:00:00	0	0	0	0	0	0	0	10	0	0	0	10	1	0	0	0	0	1	0	35	0	0	0	35	46	
06:15:00	0	0	0	0	1	0	0	18	0	0	0	18	0	0	1	0	1	1	0	39	0	0	0	39	58	
06:30:00	0	0	0	0	4	0	0	28	1	0	0	29	0	0	0	0	3	0	0	37	0	0	0	37	66	
06:45:00	0	0	0	0	2	0	0	25	0	0	1	25	1	0	0	0	3	1	2	58	0	0	0	60	86	256
07:00:00	0	0	0	0	7	0	0	25	1	0	0	26	0	0	0	0	9	0	1	63	0	0	0	64	90	300
07:15:00	0	0	0	0	4	0	0	34	1	0	0	35	1	0	2	0	2	3	0	70	0	0	1	70	108	350
07:30:00	0	0	0	0	4	0	0	40	1	0	0	41	1	0	0	0	3	1	0	89	0	0	0	89	131	415
07:45:00	0	0	0	0	3	0	0	45	0	0	0	45	1	0	0	0	3	1	0	78	0	0	0	78	124	453
08:00:00	0	0	0	0	5	0	0	45	0	0	0	45	3	0	1	0	6	4	1	104	0	0	1	105	154	517
08:15:00	0	0	0	0	6	0	0	50	2	0	3	52	2	0	2	0	6	4	0	97	0	0	0	97	153	562
08:30:00	0	0	0	0	3	0	0	60	2	0	1	62	1	0	1	0	2	2	1	101	0	0	0	102	166	597
08:45:00	0	0	0	0	1	0	0	66	0	0	0	66	3	0	4	0	5	7	1	108	0	0	0	109	182	655
09:00:00	0	0	0	0	2	0	0	81	0	0	0	81	0	0	0	0	7	0	4	100	0	0	2	104	185	686
09:15:00	0	0	0	0	3	0	0	69	3	0	0	72	2	0	1	0	3	3	0	78	0	0	0	78	153	686
09:30:00	1	0	0	0	14	1	0	81	0	0	0	81	3	0	1	0	5	4	3	109	1	0	0	113	199	719
09:45:00	0	0	0	0	8	0	0	57	2	0	0	59	0	0	0	0	2	0	0	103	0	0	0	103	162	699
BREAK																										
15:00:00	0	0	0	0	1	0	0	132	0	0	0	132	2	0	1	0	0	3	2	86	1	0	1	89	224	
15:15:00	0	0	0	0	0	0	2	117	1	0	0	120	1	0	0	0	1	1	1	109	0	0	0	110	231	
15:30:00	0	0	1	0	3	1	2	141	0	0	1	143	2	0	3	0	0	5	0	99	0	0	1	99	248	
15:45:00	2	0	1	0	4	3	5	160	1	0	0	166	1	0	0	0	0	1	1	111	0	0	0	112	282	985
16:00:00	0	0	1	0	2	1	0	144	4	0	0	148	0	0	0	0	3	0	4	96	1	0	0	101	250	1011
16:15:00	0	0	1	0	0	1	1	158	3	0	0	162	2	1	3	0	4	6	2	109	1	0	0	112	281	1061
16:30:00	2	0	0	0	1	2	1	151	3	0	0	155	1	0	0	0	2	1	2	122	0	0	0	124	282	1095
16:45:00	1	0	0	0	4	1	0	141	1	0	0	142	2	0	0	0	3	2	1	120	0	0	0	121	266	1079
17:00:00	0	0	0	0	1	0	1	154	2	0	0	157	3	0	0	0	4	3	3	105	0	0	0	108	268	1097
17:15:00	1	0	0	0	1	1	1	149	1	0	0	151	1	0	3	0	1	4	2	110	0	0	0	112	268	1084
17:30:00	0	0	0	0	1	0	0	125	2	0	0	127	3	0	1	0	5	4	0	91	0	0	0	91	222	1024
17:45:00	1	0	0	0	1	1	0	140	1	0	0	141	0	0	2	0	2	2	2	92	1	0	0	95	239	997
18:00:00	0	0	0	0	0	0	0	114	2	0	0	116	0	0	1	0	0	1	2	77	0	0	0	79	196	925
18:15:00	0	0	0	0	0	0	0	94	0	0	0	94	1	0	0	0	0	1	2	66	0	0	0	68	163	820
18:30:00	0	0	0	0	0	0	0	90	1	0	0	91	1	0	0	0	0	1	0	89	0	0	0	89	181	779
18:45:00	0	0	0	0	0	0	0	69	2	0	0	71	1	0	1	0	1	2	1	64	0	0	0	65	138	678
Grand Total	8	0	4	0	86	12	13	2813	37	0	6	2863	40	1	28	0	86	69	38	2815	5	0	6	2858	**5802**	-
Approach%	66.7%	0%	33.3%	0%		-	0.5%	98.3%	1.3%	0%		-	58%	1.4%	40.6%	0%		-	1.3%	98.5%	0.2%	0%		-	-	-
Totals %	0.1%	0%	0.1%	0%		0.2%	0.2%	48.5%	0.6%	0%		49.3%	0.7%	0%	0.5%	0%		1.2%	0.7%	48.5%	0.1%	0%		49.3%	-	-
Heavy	0	0	0	0		-	0	51	1	0		-	2	0	0	0		-	2	54	0	0		-	-	-
Heavy %	0%	0%	0%	0%		-	0%	1.8%	2.7%	0%		-	5%	0%	0%	0%		-	5.3%	1.9%	0%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Spectrum

Turning Movement Count
Location Name: LAKESHORE RD W & WEST ST
Date: Tue, Jun 29, 2021 Deployment Lead: Theo Daglis

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:45 AM - 09:45 AM Weather: Clear Sky (22.07 °C)

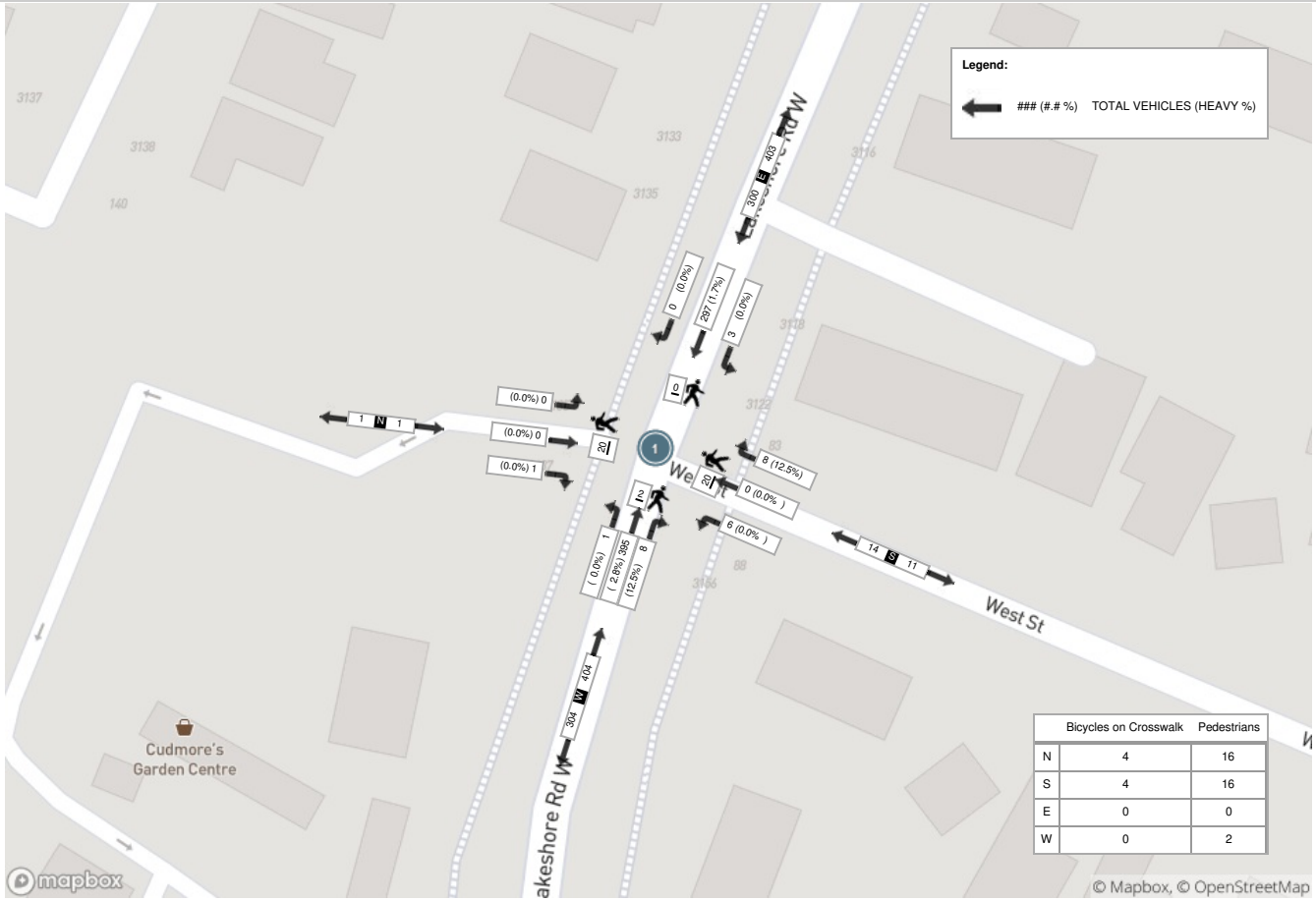
Start Time	N Approach NORTH DRIVEWAY						E Approach LAKESHORE RD W						S Approach WEST ST						W Approach LAKESHORE RD W						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:45:00	0	0	0	0	1	0	0	66	0	0	0	66	3	0	4	0	5	7	1	108	0	0	0	109	182
09:00:00	0	0	0	0	2	0	0	81	0	0	0	81	0	0	0	0	7	0	4	100	0	0	2	104	185
09:15:00	0	0	0	0	3	0	0	69	3	0	0	72	2	0	1	0	3	3	0	78	0	0	0	78	153
09:30:00	1	0	0	0	14	1	0	81	0	0	0	81	3	0	1	0	5	4	3	109	1	0	0	113	199
Grand Total	1	0	0	0	20	1	0	297	3	0	0	300	8	0	6	0	20	14	8	395	1	0	2	404	**719**
Approach%	100%	0%	0%	0%		-	0%	99%	1%	0%		-	57.1%	0%	42.9%	0%		-	2%	97.8%	0.2%	0%		-	**-**
Totals %	0.1%	0%	0%	0%		0.1%	0%	41.3%	0.4%	0%		41.7%	1.1%	0%	0.8%	0%		1.9%	1.1%	54.9%	0.1%	0%		56.2%	**-**
PHF	0.25	0	0	0		0.25	0	0.92	0.25	0		0.93	0.67	0	0.38	0		0.5	0.5	0.91	0.25	0		0.89	**-**
Heavy	0	0	0	0		0	0	5	0	0		5	1	0	0	0		1	1	11	0	0		12	**-**
Heavy %	0%	0%	0%	0%		0%	0%	1.7%	0%	0%		1.7%	12.5%	0%	0%	0%		7.1%	12.5%	2.8%	0%	0%		3%	**-**
Lights	1	0	0	0		1	0	276	3	0		279	7	0	5	0		12	5	370	1	0		376	**-**
Lights %	100%	0%	0%	0%		100%	0%	92.9%	100%	0%		93%	87.5%	0%	83.3%	0%		85.7%	62.5%	93.7%	100%	0%		93.1%	**-**
Single-Unit Trucks	0	0	0	0		0	0	3	0	0		3	1	0	0	0		1	1	6	0	0		7	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	1%	0%	0%		1%	12.5%	0%	0%	0%		7.1%	12.5%	1.5%	0%	0%		1.7%	**-**
Buses	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	2	0	0		2	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	0.5%	0%	0%		0.5%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	3	0	0		3	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.7%	**-**
Bicycles on Road	0	0	0	0		0	0	16	0	0		16	0	0	1	0		1	2	14	0	0		16	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	5.4%	0%	0%		5.3%	0%	0%	16.7%	0%		7.1%	25%	3.5%	0%	0%		4%	**-**
Pedestrians	-	-	-	-	16	-	-	-	-	-	0	-	-	-	-	-	16	-	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	-	38.1%		-	-	-	-	0%		-	-	-	-	38.1%		-	-	-	-	4.8%		**-**
Bicycles on Crosswalk	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	9.5%		-	-	-	-	0%		-	-	-	-	9.5%		-	-	-	-	0%		**-**

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:15 PM - 05:15 PM Weather: Light Rain (30.62 °C)

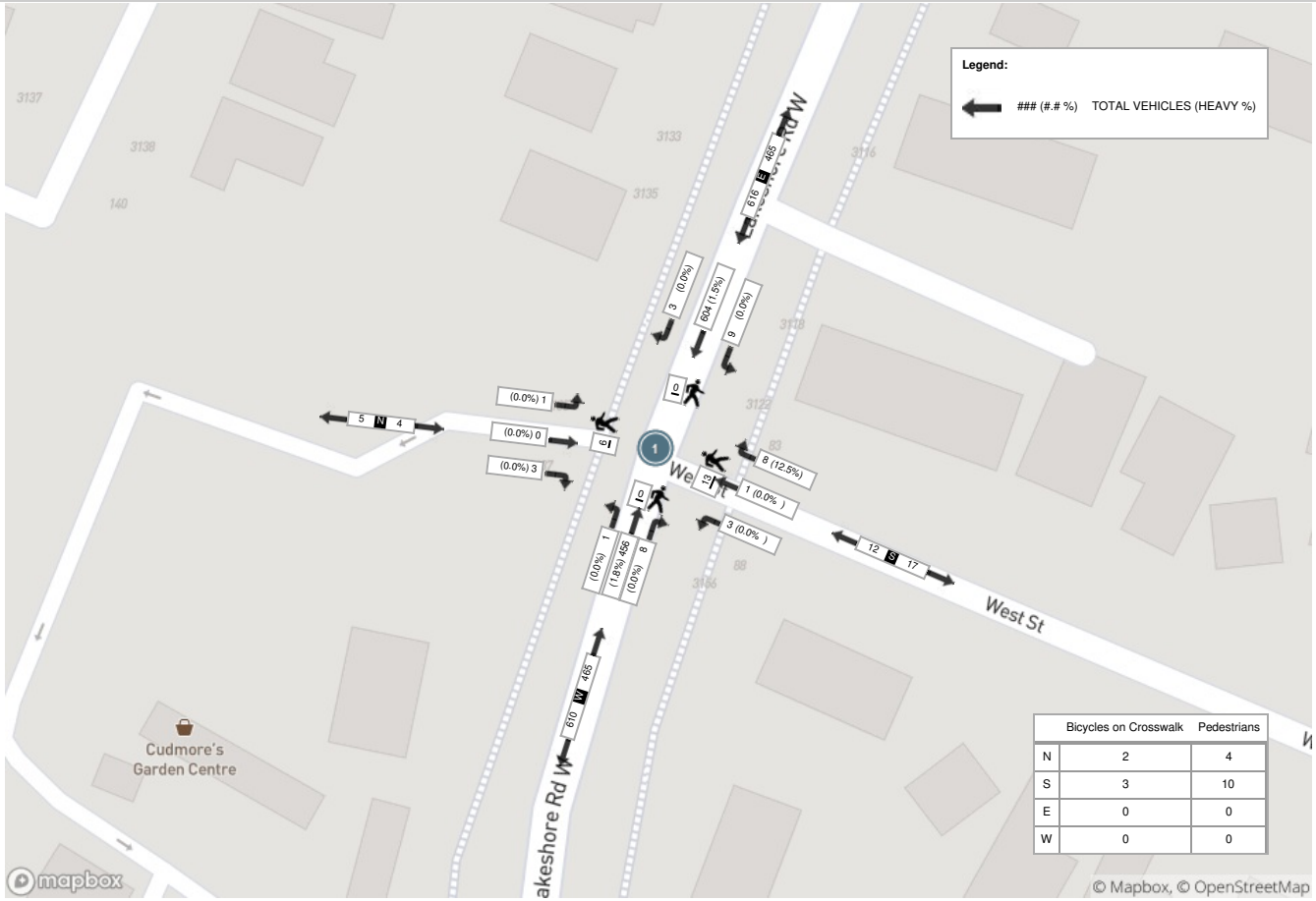
Start Time	N Approach NORTH DRIVEWAY						E Approach LAKESHORE RD W						S Approach WEST ST						W Approach LAKESHORE RD W						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	0	0	1	0	0	1	1	158	3	0	0	162	2	1	3	0	4	6	2	109	1	0	0	112	281
16:30:00	2	0	0	0	1	2	1	151	3	0	0	155	1	0	0	0	2	1	2	122	0	0	0	124	282
16:45:00	1	0	0	0	4	1	0	141	1	0	0	142	2	0	0	0	3	2	1	120	0	0	0	121	266
17:00:00	0	0	0	0	1	0	1	154	2	0	0	157	3	0	0	0	4	3	3	105	0	0	0	108	268
Grand Total	3	0	1	0	6	4	3	604	9	0	0	616	8	1	3	0	13	12	8	456	1	0	0	465	**1097**
Approach%	75%	0%	25%	0%		-	0.5%	98.1%	1.5%	0%		-	66.7%	8.3%	25%	0%		-	1.7%	98.1%	0.2%	0%		-	**-**
Totals %	0.3%	0%	0.1%	0%		0.4%	0.3%	55.1%	0.8%	0%		56.2%	0.7%	0.1%	0.3%	0%		1.1%	0.7%	41.6%	0.1%	0%		42.4%	**-**
PHF	0.38	0	0.25	0		0.5	0.75	0.96	0.75	0		0.95	0.67	0.25	0.25	0		0.5	0.67	0.93	0.25	0		0.94	**-**
Heavy	0	0	0	0		0	0	9	0	0		9	1	0	0	0		1	0	8	0	0		8	**-**
Heavy %	0%	0%	0%	0%		0%	0%	1.5%	0%	0%		1.5%	12.5%	0%	0%	0%		8.3%	0%	1.8%	0%	0%		1.7%	**-**
Lights	3	0	1	0		4	3	593	9	0		605	7	1	3	0		11	8	444	1	0		453	**-**
Lights %	100%	0%	100%	0%		100%	100%	98.2%	100%	0%		98.2%	87.5%	100%	100%	0%		91.7%	100%	97.4%	100%	0%		97.4%	**-**
Single-Unit Trucks	0	0	0	0		0	0	6	0	0		6	0	0	0	0		0	0	4	0	0		4	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	1%	0%	0%		1%	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.9%	**-**
Buses	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	2	0	0		2	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.4%	**-**
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	1	0	0	0		1	0	2	0	0		2	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	12.5%	0%	0%	0%		8.3%	0%	0.4%	0%	0%		0.4%	**-**
Bicycles on Road	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	4	0	0		4	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.9%	**-**
Pedestrians	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	10	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	21.1%		-	-	-	-	0%		-	-	-	-	52.6%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	10.5%		-	-	-	-	0%		-	-	-	-	15.8%		-	-	-	-	0%		**-**

Peak Hour: 08:45 AM - 09:45 AM **Weather: Clear Sky (22.07 °C)**



	Bicycles on Crosswalk	Pedestrians
N	4	16
S	4	16
E	0	0
W	0	2

Peak Hour: 04:15 PM - 05:15 PM **Weather: Light Rain (30.62 °C)**



	Bicycles on Crosswalk	Pedestrians
N	2	4
S	3	10
E	0	0
W	0	0

APPENDIX D

LOS Definitions

Level of Service Definitions

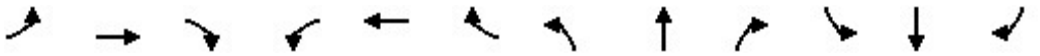
Two-Way Stop Controlled Intersections

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

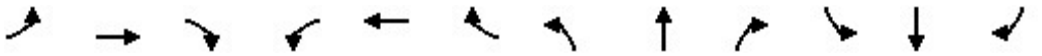
APPENDIX E

Detailed Capacity Analysis Worksheets



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	6	0	8	1	790	8	3	297	0
Future Volume (vph)	0	0	1	6	0	8	1	790	8	3	297	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.924			0.998				
Flt Protected					0.979		0.950			0.950		
Satd. Flow (prot)	0	1629	0	0	1704	0	1789	1880	0	1789	1883	0
Flt Permitted					0.979		0.950			0.950		
Satd. Flow (perm)	0	1629	0	0	1704	0	1789	1880	0	1789	1883	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		65.1			106.3			89.4			84.2	
Travel Time (s)		4.7			7.7			6.4			6.1	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Adj. Flow (vph)	0	0	1	7	0	9	1	849	9	3	334	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	16	0	1	858	0	3	334	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
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
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.0%		ICU Level of Service B	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	1	6	0	8	1	790	8	3	297	0
Future Volume (Veh/h)	0	0	1	6	0	8	1	790	8	3	297	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	1	7	0	9	1	849	9	3	334	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1200	1200	334	1196	1196	854	334			858		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1200	1200	334	1196	1196	854	334			858		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	97	100			100		
cM capacity (veh/h)	157	184	708	162	185	359	1225			783		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	1	16	1	858	3	334
Volume Left	0	7	1	0	3	0
Volume Right	1	9	0	9	0	0
cSH	708	234	1225	1700	783	1700
Volume to Capacity	0.00	0.07	0.00	0.50	0.00	0.20
Queue Length 95th (m)	0.0	1.7	0.0	0.0	0.1	0.0
Control Delay (s)	10.1	21.5	7.9	0.0	9.6	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	10.1	21.5	0.0		0.1	
Approach LOS	B	C				

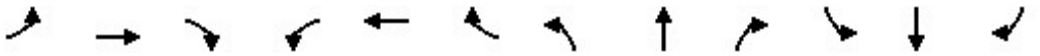
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	55.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection: 1: Lakeshore Road West & Site Access/West Street

Movement	EB	WB	SB
Directions Served	LTR	LTR	L
Maximum Queue (m)	1.4	7.6	1.6
Average Queue (m)	0.3	1.8	0.3
95th Queue (m)	2.6	7.2	2.8
Link Distance (m)	46.6	95.0	75.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

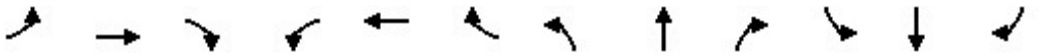
Network Summary

Network wide Queuing Penalty: 0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	3	3	1	8	1	456	8	9	906	3
Future Volume (vph)	1	0	3	3	1	8	1	456	8	9	906	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.892			0.913			0.997				
Flt Protected		0.990			0.986		0.950			0.950		
Satd. Flow (prot)	0	1663	0	0	1696	0	1789	1878	0	1789	1883	0
Flt Permitted		0.990			0.986		0.950			0.950		
Satd. Flow (perm)	0	1663	0	0	1696	0	1789	1878	0	1789	1883	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		65.1			106.3			89.4			84.2	
Travel Time (s)		4.9			8.0			6.7			6.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Adj. Flow (vph)	1	0	4	4	1	9	1	490	9	10	1018	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	14	0	1	499	0	10	1021	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
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
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.9%		ICU Level of Service B	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	3	3	1	8	1	456	8	9	906	3
Future Volume (Veh/h)	1	0	3	3	1	8	1	456	8	9	906	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Hourly flow rate (vph)	1	0	4	4	1	9	1	490	9	10	1018	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1541	1540	1020	1538	1538	494	1021			499		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1541	1540	1020	1538	1538	494	1021			499		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	99	96	99	98	100			99		
cM capacity (veh/h)	91	114	287	92	115	575	680			1065		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	5	14	1	499	10	1021
Volume Left	1	4	1	0	10	0
Volume Right	4	9	0	9	0	3
cSH	201	207	680	1700	1065	1700
Volume to Capacity	0.02	0.07	0.00	0.29	0.01	0.60
Queue Length 95th (m)	0.6	1.6	0.0	0.0	0.2	0.0
Control Delay (s)	23.4	23.7	10.3	0.0	8.4	0.0
Lane LOS	C	C	B		A	
Approach Delay (s)	23.4	23.7	0.0		0.1	
Approach LOS	C	C				

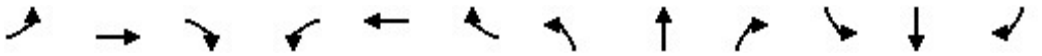
Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	57.9%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection: 1: Lakeshore Road West & Site Access/West Street

Movement	EB	WB	SB
Directions Served	LTR	LTR	L
Maximum Queue (m)	5.5	7.7	4.6
Average Queue (m)	1.1	1.5	1.2
95th Queue (m)	5.3	6.6	5.9
Link Distance (m)	46.6	95.0	75.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

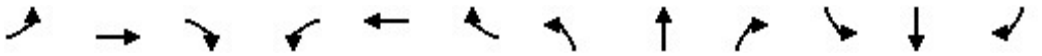
Network Summary

Network wide Queuing Penalty: 0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	6	0	8	1	830	8	3	312	0
Future Volume (vph)	0	0	1	6	0	8	1	830	8	3	312	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.924			0.999				
Flt Protected					0.979		0.950			0.950		
Satd. Flow (prot)	0	1629	0	0	1704	0	1789	1882	0	1789	1883	0
Flt Permitted					0.979		0.950			0.950		
Satd. Flow (perm)	0	1629	0	0	1704	0	1789	1882	0	1789	1883	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		65.1			106.3			89.4			84.2	
Travel Time (s)		4.9			8.0			6.7			6.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Adj. Flow (vph)	0	0	1	7	0	9	1	892	9	3	351	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	16	0	1	901	0	3	351	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
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
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.1%		ICU Level of Service B	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	1	6	0	8	1	830	8	3	312	0
Future Volume (Veh/h)	0	0	1	6	0	8	1	830	8	3	312	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	1	7	0	9	1	892	9	3	351	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1260	1260	351	1256	1256	896	351			901		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1260	1260	351	1256	1256	896	351			901		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	95	100	97	100			100		
cM capacity (veh/h)	143	170	692	147	171	339	1208			754		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	1	16	1	901	3	351
Volume Left	0	7	1	0	3	0
Volume Right	1	9	0	9	0	0
cSH	692	216	1208	1700	754	1700
Volume to Capacity	0.00	0.07	0.00	0.53	0.00	0.21
Queue Length 95th (m)	0.0	1.8	0.0	0.0	0.1	0.0
Control Delay (s)	10.2	23.0	8.0	0.0	9.8	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	10.2	23.0	0.0		0.1	
Approach LOS	B	C				

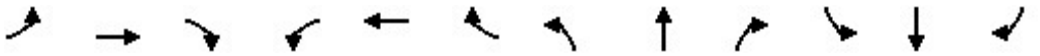
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	57.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection: 1: Lakeshore Road West & Site Access/West Street

Movement	EB	WB	SB
Directions Served	LTR	LTR	L
Maximum Queue (m)	1.4	7.7	1.6
Average Queue (m)	0.3	1.9	0.3
95th Queue (m)	2.6	7.3	2.8
Link Distance (m)	46.6	95.0	75.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

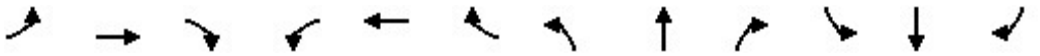
Network Summary

Network wide Queuing Penalty: 0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	3	3	1	8	1	479	8	9	952	3
Future Volume (vph)	1	0	3	3	1	8	1	479	8	9	952	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.892			0.913			0.997				
Flt Protected		0.990			0.986		0.950			0.950		
Satd. Flow (prot)	0	1663	0	0	1696	0	1789	1878	0	1789	1883	0
Flt Permitted		0.990			0.986		0.950			0.950		
Satd. Flow (perm)	0	1663	0	0	1696	0	1789	1878	0	1789	1883	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		65.1			106.3			89.4			84.2	
Travel Time (s)		4.9			8.0			6.7			6.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Adj. Flow (vph)	1	0	4	4	1	9	1	515	9	10	1070	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	14	0	1	524	0	10	1073	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
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
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.3%		ICU Level of Service B	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	3	3	1	8	1	479	8	9	952	3
Future Volume (Veh/h)	1	0	3	3	1	8	1	479	8	9	952	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Hourly flow rate (vph)	1	0	4	4	1	9	1	515	9	10	1070	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1618	1618	1072	1616	1614	520	1073			524		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1618	1618	1072	1616	1614	520	1073			524		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	99	95	99	98	100			99		
cM capacity (veh/h)	80	102	268	81	103	556	650			1043		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	5	14	1	524	10	1073
Volume Left	1	4	1	0	10	0
Volume Right	4	9	0	9	0	3
cSH	183	187	650	1700	1043	1700
Volume to Capacity	0.03	0.08	0.00	0.31	0.01	0.63
Queue Length 95th (m)	0.6	1.8	0.0	0.0	0.2	0.0
Control Delay (s)	25.2	25.9	10.5	0.0	8.5	0.0
Lane LOS	D	D	B		A	
Approach Delay (s)	25.2	25.9	0.0		0.1	
Approach LOS	D	D				

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	60.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection: 1: Lakeshore Road West & Site Access/West Street

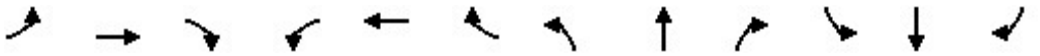
Movement	EB	WB	SB
Directions Served	LTR	LTR	L
Maximum Queue (m)	5.5	7.7	4.6
Average Queue (m)	1.1	1.5	1.2
95th Queue (m)	5.3	6.6	5.9
Link Distance (m)	46.6	95.0	75.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	0	2	6	0	8	1	832	8	3	312	2
Future Volume (vph)	10	0	2	6	0	8	1	832	8	3	312	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981			0.924			0.999			0.999	
Flt Protected		0.959			0.979		0.950			0.950		
Satd. Flow (prot)	0	1772	0	0	1704	0	1789	1882	0	1789	1882	0
Flt Permitted		0.959			0.979		0.950			0.950		
Satd. Flow (perm)	0	1772	0	0	1704	0	1789	1882	0	1789	1882	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		65.1			106.3			89.4			84.2	
Travel Time (s)		4.9			8.0			6.7			6.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Adj. Flow (vph)	12	0	2	7	0	9	1	895	9	3	351	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	0	0	16	0	1	904	0	3	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
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
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	2	6	0	8	1	832	8	3	312	2
Future Volume (Veh/h)	10	0	2	6	0	8	1	832	8	3	312	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Hourly flow rate (vph)	12	0	2	7	0	9	1	895	9	3	351	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1264	1264	352	1260	1260	900	353			904		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1264	1264	352	1260	1260	900	353			904		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	100	95	100	97	100			100		
cM capacity (veh/h)	142	169	692	146	169	337	1206			752		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	14	16	1	904	3	353
Volume Left	12	7	1	0	3	0
Volume Right	2	9	0	9	0	2
cSH	160	215	1206	1700	752	1700
Volume to Capacity	0.09	0.07	0.00	0.53	0.00	0.21
Queue Length 95th (m)	2.2	1.8	0.0	0.0	0.1	0.0
Control Delay (s)	29.6	23.1	8.0	0.0	9.8	0.0
Lane LOS	D	C	A		A	
Approach Delay (s)	29.6	23.1	0.0		0.1	
Approach LOS	D	C				

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	54.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Lakeshore Road West & Site Access/West Street

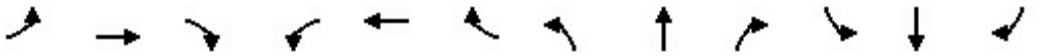
Movement	EB	WB	SB
Directions Served	LTR	LTR	L
Maximum Queue (m)	8.3	7.7	1.6
Average Queue (m)	3.0	1.9	0.3
95th Queue (m)	9.1	7.3	2.8
Link Distance (m)	46.6	95.0	75.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	1	3	0	8	3	480	8	9	955	10
Future Volume (vph)	6	0	1	3	0	8	3	480	8	9	955	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.983			0.907			0.997			0.998	
Flt Protected		0.958			0.985		0.950			0.950		
Satd. Flow (prot)	0	1774	0	0	1683	0	1789	1878	0	1789	1880	0
Flt Permitted		0.958			0.985		0.950			0.950		
Satd. Flow (perm)	0	1774	0	0	1683	0	1789	1878	0	1789	1880	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		65.1			106.3			89.4			84.2	
Travel Time (s)		4.9			8.0			6.7			6.3	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Adj. Flow (vph)	7	0	1	4	0	9	3	516	9	10	1073	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	13	0	3	525	0	10	1084	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
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
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.9%		ICU Level of Service B	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	1	3	0	8	3	480	8	9	955	10
Future Volume (Veh/h)	6	0	1	3	0	8	3	480	8	9	955	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.89	0.89	0.89
Hourly flow rate (vph)	7	0	1	4	0	9	3	516	9	10	1073	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1630	1630	1078	1620	1630	520	1084			525		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1630	1630	1078	1620	1630	520	1084			525		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	100	95	100	98	100			99		
cM capacity (veh/h)	79	100	266	81	100	556	643			1042		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	8	13	3	525	10	1084
Volume Left	7	4	3	0	10	0
Volume Right	1	9	0	9	0	11
cSH	87	199	643	1700	1042	1700
Volume to Capacity	0.09	0.07	0.00	0.31	0.01	0.64
Queue Length 95th (m)	2.2	1.6	0.1	0.0	0.2	0.0
Control Delay (s)	50.6	24.3	10.6	0.0	8.5	0.0
Lane LOS	F	C	B		A	
Approach Delay (s)	50.6	24.3	0.1		0.1	
Approach LOS	F	C				

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection: 1: Lakeshore Road West & Site Access/West Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	8.2	7.7	2.2	4.6
Average Queue (m)	2.4	1.5	0.4	1.2
95th Queue (m)	8.4	6.6	2.9	5.9
Link Distance (m)	46.6	95.0	73.3	75.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

APPENDIX F

TTS Data

Wed Jun 12 2019 11:26:00 GMT-0400 (Eastern Daylight Time) - Run Time: 2120ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest
Column: Primary travel mode of trip - mode_prime

Filters:
(Start time of trip - start_time In 700-1000
and
2006 GTA zone of origin - gta06_orig In 4001
and
Primary travel mo( )

Trip 2016
Table:

	Auto driver	% total	**Direction**
PD 1 of Toronto	67	2.3%	East
PD 7 of Toronto	59	2.0%	East
PD 8 of Toronto	57	1.9%	East
Markham	22	0.7%	East
Brampton	57	1.9%	East
Mississauga	487	16.4%	East
Milton	65	2.2%	North
Oakville	1580	53.2%	East
Burlington	382	12.9%	West
Hamilton	132	4.4%	West
Kitchener	29	1.0%	West
Brantford	16	0.5%	West
External	15	0.5%	West
	2968	100%	

Direction	**% of trips**	**% assumed**
East	78.5%	75%
West	19.3%	20%
North	2.2%	5%

APPENDIX G

Warrants Assessment

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Lakeshore Road & West Street

What is the direction of the Main Road street? East-West

When was the data collected? Future Total 2026

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 4

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Eastbound Approach			Minor Northbound Approach			Main Westbound Approach			Minor Southbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	1	328	4	4	0	1	3	317	3	2	0	4	18
8:00	1	328	4	4	0	1	3	317	3	2	0	4	18
9:00	1	328	4	4	0	1	3	317	3	2	0	4	18
12:00	1	328	4	4	0	1	3	317	3	2	0	4	18
13:00	1	328	4	4	0	1	3	317	3	2	0	4	18
16:00	1	328	4	4	0	1	3	317	3	2	0	4	18
17:00	1	328	4	4	0	1	3	317	3	2	0	4	18
18:00	1	328	4	4	0	1	3	317	3	2	0	4	18
Total	**8**	**2,624**	**32**	**32**	**0**	**8**	**24**	**2,536**	**24**	**16**	**0**	**32**	**144**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume									
Factored 8 hour pedestrian volume	0		0		0		0		
% Assigned to crossing rate	23%		34%		30%		100%		
Net 8 Hour Pedestrian Volume at Crossing									0
Net 8 Hour Vehicular Volume on Street Being Crossed									2,000

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	10	10	1	6	2	4	0	0	
Factored volume of total pedestrians	0		0		0		0		
Factored volume of delayed pedestrians	30		8		8		0		
% Assigned to Crossing Rate	23%		34%		30%		100%		
Net 8 Hour Volume of Total Pedestrians									0
Net 8 Hour Volume of Delayed Pedestrians									12

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Lakeshore Road & West Street

Count Date: Future Total 2026

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	93	%	☐	☑
	B	Crossing Volume	6	%		
2. Delay to Cross Traffic	A	Main Road	91	%	☐	☑
	B	Crossing Road	32	%		
3. Combination	A	Justificaton 1	6	%	☐	☑
	B	Justification 2	32	%		
4. 4-Hr Volume			3	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

APPENDIX H

TIS (July 2019) Excerpts

6.0 Future Total Conditions

6.1 Basis of Assessment

The traffic impacts arising from the proposed development were assessed based on the site generated traffic illustrated in **Figure 6.** The resulting total traffic volumes for the weekday a.m. and p.m. peak hours are illustrated in **Figure 7**.

6.2 Intersection Operations

The 2024 future total intersection operations at the study intersections were analyzed using the 2024 future total traffic volumes illustrated in **Figure 7**. Detailed capacity analysis worksheets are included in **Appendix E**.

Table 4 outlines the 2024 future background traffic operations.

Table 4: 2024 Future Total Traffic Operations

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical v/c ratio [2]	95th Percentile Queue Length > Storage Length
Lakeshore Road West and Chalmers Street	Signal	A.M.	A	9.9 s	0.64 (EBTR)	None
		P.M.	A	9.5 s	0.70 (WBTR)	None
Victoria Street and Chalmers Street	Stop (Minor Street)	A.M.	A	9.7 s (WBLTR)	0.05 (WBLTR)	None
		P.M.	A	9.7 s (WBLTR)	0.03 (WBLTR)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection where the maximum v/c ratio does not exceed the critical thresholds. All v/c ratios for through or shared through/turning movements exceeding 0.85 and all v/c ratios for exclusive turning movements exceeding 0.95 are listed and highlighted per the Region's TIS Guidelines.

The boundary road network is expected to continue operating at LOS "A" during the weekday a.m. and p.m. peak hours under 2024 future total conditions, with minor control delays and no critical volume-to-capacity ratios or 95th percentile queue lengths. The maximum forecasted increase in control delay is 0.5 seconds compared to 2024 future background conditions.

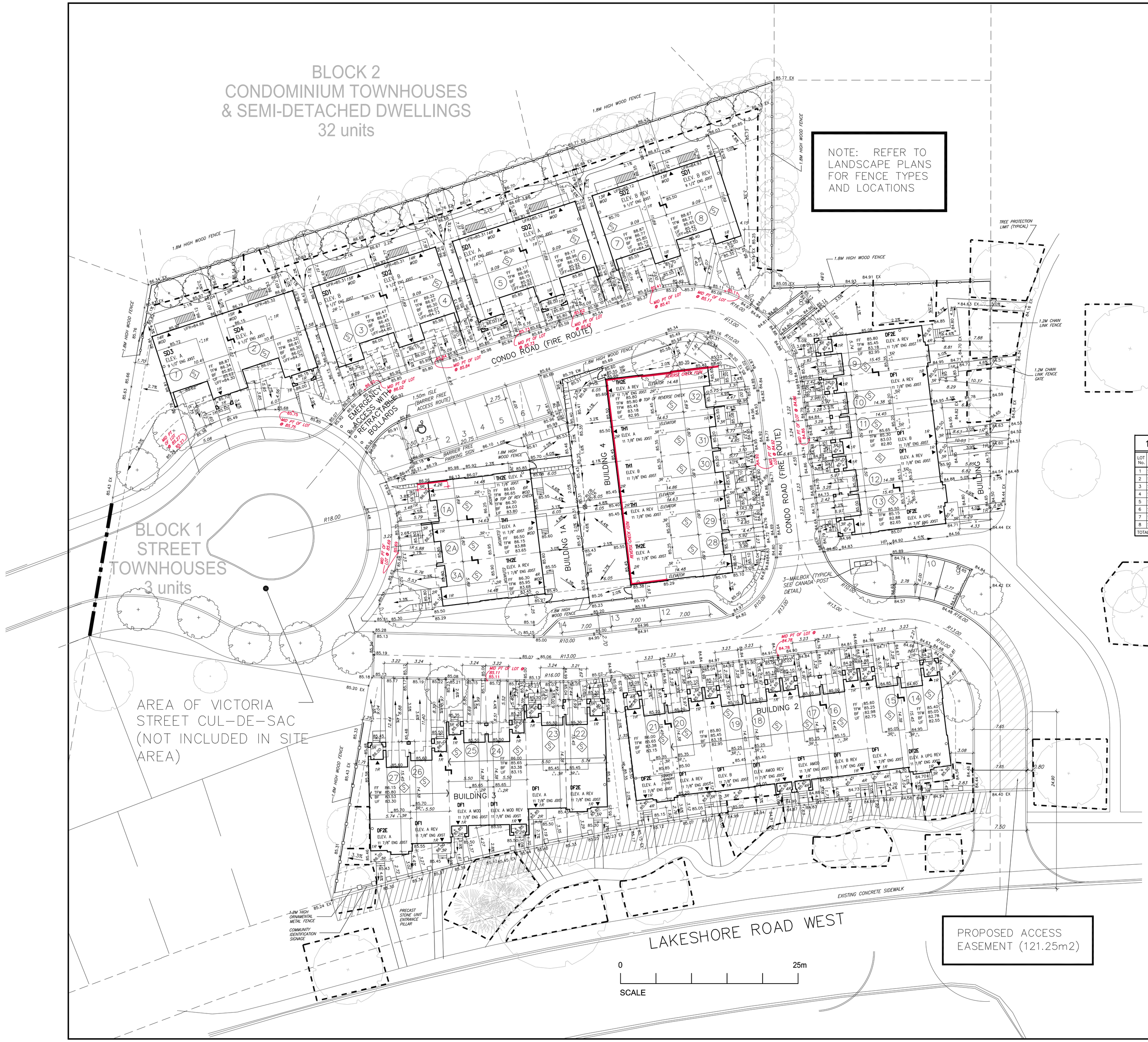
These operations indicate that the addition of site traffic to the boundary road network is expected to minimally impact traffic operations. These operations also indicate that the Victoria Street extension through the subject property is not required.

Therefore, the proposed development is supportable from a traffic operations perspective.

7.0 Victoria Street Extension

One of the key components of this TIS Addendum is to determine whether the Victoria Street Extension is required from a traffic operations perspective. This Addendum analyzed the intersections of Chalmers Street at Victoria Street and Lakeshore Road West under 2024 future total conditions without

FIGURES



SITE STATISTICS SUMMARY (WITH OVERALL LOT AREA

DRAFT PLAN OF SUBDIVISION PART OF LOT 32, CONCESSION 4, SOUTH OF DUNDAS STREET (GEOGRAPHIC TOWNSHIP OF TRAFALGAR) AND BLOCK 79, REGISTERED PLAN M-257 TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON

ZONING :	RM1-XX
OVERALL LOT AREA: *(LOT AREA OWNED BY DEVELOPER)*	9,925.86m2 2.45 ACRES 1.00 Ha
SITE AREA: *(SITE AREA, NOT INCLUDING CUL-DE-SAC/STREET TOWNS)*	8,193.89m2 2.03 ACRES 0.82 Ha
O.B.C. BUILDING CLASSIFICATION	PART 9, GROUP C 3 STOREY BUILDINGS/SEMIS
GROSS FLOOR AREA:	7,561.20m2 (92.28% OF SITE AREA)
TOTAL UNIT COVERAGE:	2,836.23m2 (34.62% OF SITE AREA)
DENSITY 32 UNITS TOTAL *(NOT INCLUDING 3 STREET TOWNS)*	39.02 PER Ha 15.76 PER ACRES
PARKING :	*27 TOWN HOMES RESIDENCE PARKING PROVIDED (1 INTERNAL & 1 EXTERNAL) 54 SPACES TOTAL*
	8 SEMI-DETACHED HOMES RESIDENCE PARKING PROVIDED (2 INTERNAL & 2 EXTERNAL) 32 SPACES TOTAL
	VISITOR PARKING: 35 x 0.25 = 8.75 (9 VISITOR PARKING REQUIRED) 14 VISITOR PARKING PROVIDED (INCLUDES 1 ACCESSIBLE SPACE)

UNIT COUNT

10.35m SEMI DETACHED (INCLUDES 2-11.60m SEMI DETACHED)	8
5.50m DUAL FRONTAGE TOWN HOME	27
TOTAL	35 UNITS

- PROPOSED VALVE
- HYDRANT
- WATER SERVICE
- CATCH BASIN
- CABLE TELEVISION PEDESTAL
- SUMP PUMP
- LIGHT POLE
- TRANSFORMER
- DOUBLE STM./SAN. CONNECTION
- SINGLE STM./SAN. CONNECTION
- BELL PEDESTAL

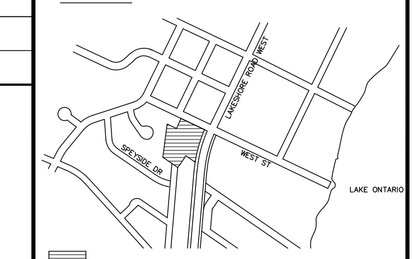
FF FINISHED FLOOR ELEVATION
ML FINISHED MAIN LEVEL ELEVATION
UF UNDERSIDE FOOTING ELEVATION
BF FIN. BASEMENT FLOOR SLAB
TFW TOP OF FOUNDATION WALL
↗ No. OF RISERS

UFR UNDERSIDE FOOTING AT REAR
UFF UNDERSIDE FOOTING AT FRONT
UFS UNDERSIDE FOOTING AT SIDE
W.O.D. WALK OUT DECK
W.O.B. WALK OUT BASEMENT
REV REVERSE PLAN

- STREET SIGN
- MAIL BOX
- RETAINING WALL
- CHAIN LINK FENCE (SEE LANDSCAPE PLAN)
- ACOUSTICAL FENCE (SEE LANDSCAPE PLAN)
- WOOD SCREEN FENCE (SEE LANDSCAPE PLAN)
- HYDRO SERVICE LATERAL
- HYDRO METER
- GAS METER
- SWALE DIRECTION
- EMBANKMENT
- PROVIDE 3/4" DIA. CLEAR STONE IN THIS AREA
- THIS LOT CONTAINS ENGINEERED FILL
- AC AIR CONDITIONER REQUIRED
- RAIN WATER DOWNSPOUT LOCATION (DISCHARGE ONTO SPLASHPAD)
- SIDE WINDOW LOCATION
- EXTERIOR DOOR LOCATION
- EXTERIOR DOOR LOCATION
- REDUCE SIDE YARD

north arrow

KEY PLAN



SUBJECT PROPERTY

10.65m SEMI DETACHED

LOT No.	Model Type	G.F.A (sq.m.)	G.F.A. Per Lot (%)	Coverage (sq.m.)	Lot Area (sq.m.)	Coverage (%)	Driveway Area (m2)	Soft Landscape Area (m2)	Soft Landscape (%)	Lot Frontage (m)	Lot Depth (m)	Proposed Building Height (m)
1	SD-3A	264.40	76.32	106.20	346.44	30.65	31.79	208.45	60.17	18.72	24.28	10.44
2	SD-4A	270.00	94.28	106.20	286.37	37.08	40.56	139.61	48.75	12.94	23.29	10.41
3	SD-1B	251.00	103.40	100.35	242.74	41.34	29.89	112.50	46.35	10.46	22.94	10.31
4	SD-2B	249.20	105.30	100.35	236.65	42.40	29.23	107.07	45.24	10.35	22.94	10.36
5	SD-1A	245.80	103.86	100.35	236.654	42.40	29.54	106.76	45.11	10.35	22.94	10.29
6	SD-2A	248.80	105.13	100.35	236.65	42.40	29.21	107.09	45.25	10.35	22.94	10.44
7	SD-2B	249.20	104.67	100.35	238.09	42.15	29.25	108.49	45.57	10.37	22.94	10.32
8	SD-1B	251.00	58.78	100.35	427.04	23.50	40.51	286.18	67.01	14.69	22.94	10.44
TOTAL		2029.40	90.17	814.50	2250.63	36.19	259.98	1176.15	52.26			

5.80m STANDARD TOWN BUILDING 1A (FREE HOLD)

LOT No.	Model Type	Coverage (sq.m.)	Lot Area (sq.m.)	Coverage (%)	Driveway Area (m2)	Soft Landscape Area (m2)	Soft Landscape (%)	Lot Frontage (m)	Lot Depth (m)	Proposed Building Height (m)
1A	TH-2E (A)	87.20	183.40	47.55	17.47	78.73	42.93	7.20	25.57	
2A	TH-1 (A)	86.00	150.12	57.29	20.39	43.73	29.13	5.87	25.81	
3A	TH-2E (A)	87.20	204.98	42.54	25.01	92.77	45.26	7.82	28.62	
TOTAL		260.40	538.50	48.36	62.87	215.23	39.97			11.94

5.40m DUAL FRONTAGE TOWN BUILDING 1 (CONDO)

LOT No.	Model Type	Coverage (sq.m.)	Lot Area (sq.m.)	Coverage (%)	Driveway Area (m2)	Soft Landscape Area (m2)	Soft Landscape (%)	Lot Frontage (m)	Lot Depth (m)	Proposed Building Height (m)
9	DF-2E (A)	82.10	315.91	25.99	18.91	214.90	68.03	10.65	28.02	
10	DF-1 (A)	74.90	145.24	51.57	18.92	51.42	35.40	5.50	26.41	
11	DF-1 (B)	79.55	141.752	56.12	18.88	43.32	30.56	5.50	25.73	
12	DF-1 A)	74.90	137.80	54.35	18.81	44.09	32.00	5.50	25.06	
13	DF-2E (A UPG)	84.56	180.14	46.94	18.86	76.72	42.59	7.69	24.26	
TOTAL		396.01	920.84	43.01	94.38	430.45	46.75			11.71

5.40m DUAL FRONTAGE TOWN BUILDING 2 (CONDO)

LOT No.	Model Type	Coverage (sq.m.)	Lot Area (sq.m.)	Coverage (%)	Driveway Area (m2)	Soft Landscape Area (m2)	Soft Landscape (%)	Lot Frontage (m)	Lot Depth (m)	Proposed Building Height (m)
14	DF-2E (A UPG)	84.56	188.34	44.90	19.69	84.09	44.65	10.25	22.01	
15	DF-1 (A)	74.90	118.41	63.25	18.83	24.68	20.84	5.50	21.53	
16	DF-1 (B)	79.55	117.16	67.90	18.88	18.73	15.99	5.50	21.30	
17	DF-1 (AMOD)	75.09	116.35	64.54	18.88	22.38	19.24	5.50	21.15	
18	DF-1 (AMOD)	75.09	116.00	64.73	18.66	22.25	19.18	5.50	21.09	
19	DF-1 (B)	79.55	116.10	68.52	18.88	17.67	15.22	5.50	21.11	
20	DF-1 (A)	74.90	116.66	64.20	18.83	23.03	19.74	5.50	21.21	
21	DF-2E (A)	82.10	151.94	54.03	18.86	50.98	33.55	7.09	21.42	
TOTAL		468.74	772.36	60.69	151.41	152.21	19.71			11.99

5.40m DUAL FRONTAGE TOWN BUILDING 3 (CONDO)

LOT No.	Model Type	Coverage (sq.m.)	Lot Area (sq.m.)	Coverage (%)	Driveway Area (m2)	Soft Landscape Area (m2)	Soft Landscape (%)	Lot Frontage (m)	Lot Depth (m)	Proposed Building Height (m)
22	DF-2E (A)	82.10	172.57	47.57	18.93	71.54	41.46	7.41	21.88	
23	DF-1 (A)	74.90	126.63	59.15	19.07	32.66	25.79	5.51	23.03	
24	DF-1 (AMOD)	75.09	133.91	56.07	27.10	31.72	23.69	5.51	24.34	
25	DF-1 (AMOD)	75.09	141.67	53.00	27.63	38.95	27.49	5.51	25.75	
26	DF-1 (A)	74.90	149.91	49.96	36.75	38.26	25.52	5.51	27.25	
27	DF-2E (A)	82.10	240.54	34.13	39.87	118.57	49.29	6.68	29.74	
TOTAL		464.18	965.23	48.09	169.35	331.70	34.36			11.81

5.80m STANDARD TOWN BUILDING 4 (CONDO)

LOT No.	Model Type	Coverage (sq.m.)	Lot Area (sq.m.)	Coverage (%)	Driveway Area (m2)	Soft Landscape Area (m2)	Soft Landscape (%)	Lot Frontage (m)	Lot Depth (m)	Proposed Building Height (m)
28	TH-2E (A)	87.20	203.76	42.80	18.81	97.75	47.97	8.49	25.53	
29	TH-1 (A)	86.00	148.10	58.07	18.40	43.70	29.51	5.80	25.53	
30	TH-1 (B)	86.00	148.10	58.07	18.35	43.75	29.54	5.80	25.53	
31	TH-1 (A)	86.00	148.10	58.07	18.17	43.93	29.66	5.80	25.53	
32	TH-2E (A)	87.20	209.52	41.62	17.65	104.67	49.96	10.14	25.53	
TOTAL		432.40	857.58	50.42	91.38	333.80	38.92			11.87

no.	description	date	by
20		-	-
19		-	-
18		-	-
17		-	-
16		-	-
15		-	-
14		-	-
13	ISSUED FOR SPA	JAN 19-22	RC
12	ADD LANDSCAPE INFO	JAN 19-22	RC
11	CHANGE MODEL FOR LOT 24/25 ADD GRADING	22-01-13	RC
10	ADDED ISLAND AT CUL-DE-SAC	21-11-09	SS
9	RE. STATS AS PER CLIENT REQUEST	22-02-10	SS
8	ADDED INDIVIDUAL STATS	21-01-20	SS
7	REVISED BUILDING SETBACK FOR BUILDING 3	20-12-10	SS
6	ADDED ACCESS EASEMENT	20-12-03	SS
5	REVISED TRAIL AT LAKESHORE ROAD WEST	20-11-11	SS
4	REMOVED EMERGENCY ACCESS	20-11-04	SS
3	REVISED OVERALL SITE PLAN	20-01-31	SS
2	REVISED AS PER CITY COMMENTS	19-08-09	SS
1	ISSUED FOR CLIENT REVIEW	19-05-01	SS

Builder to verify location of all hydrants, street lights, transformers and other services. If minimum dimensions are not maintained, builder is to relocate at his own expense.

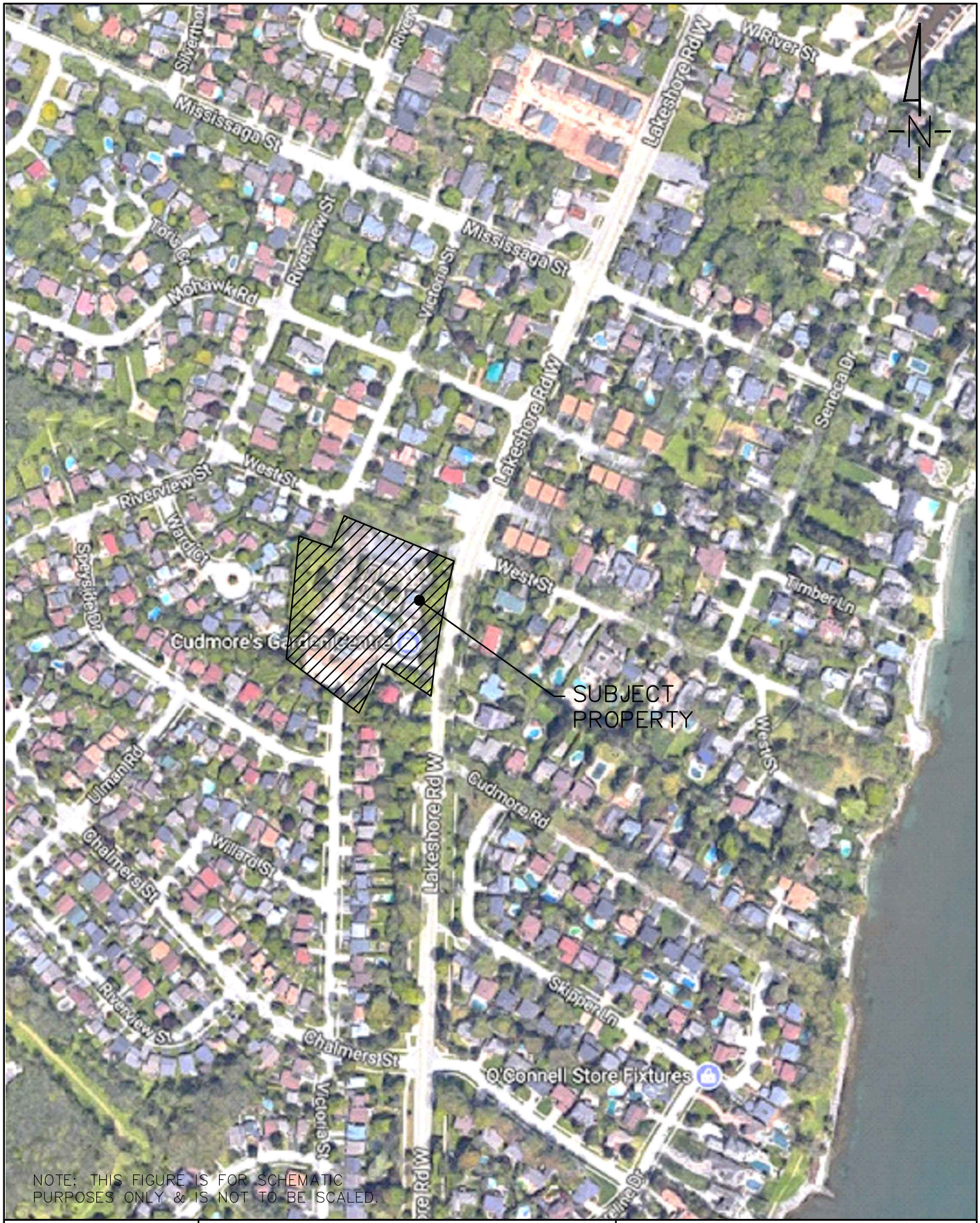
Builder to verify service connection elevations prior to constructing foundations.

VA3 DESIGN
255 Consumers Rd
Suite 120
Toronto ON M2J 1R4
t 416.630.2255
f 416.630.4782
va3design.com

The undersigned has reviewed and takes responsibility for this design and has the qualifications and meets the requirements set out in the Ontario Building Code to be a Designer.
qualification information — Richard Vink — 24488
registration information — VA3 Design Inc. — 42658

VOGUE WYCLIFFE (OAKVILLE) LTD.

project name
3171 LAKESHORE ROAD WEST
municipality — project no.
OAKVILLE, ON — 17027
registered plan no. — lot/block no.
— —
title
SITE PLAN
date — scale — drawing no.
MAY 2016 — 1:250 — S1
drawn by — checked by — file name
STEVE SOSTARIC — — 17027-SP



Legend

Project

3171 LAKESHORE ROAD WEST

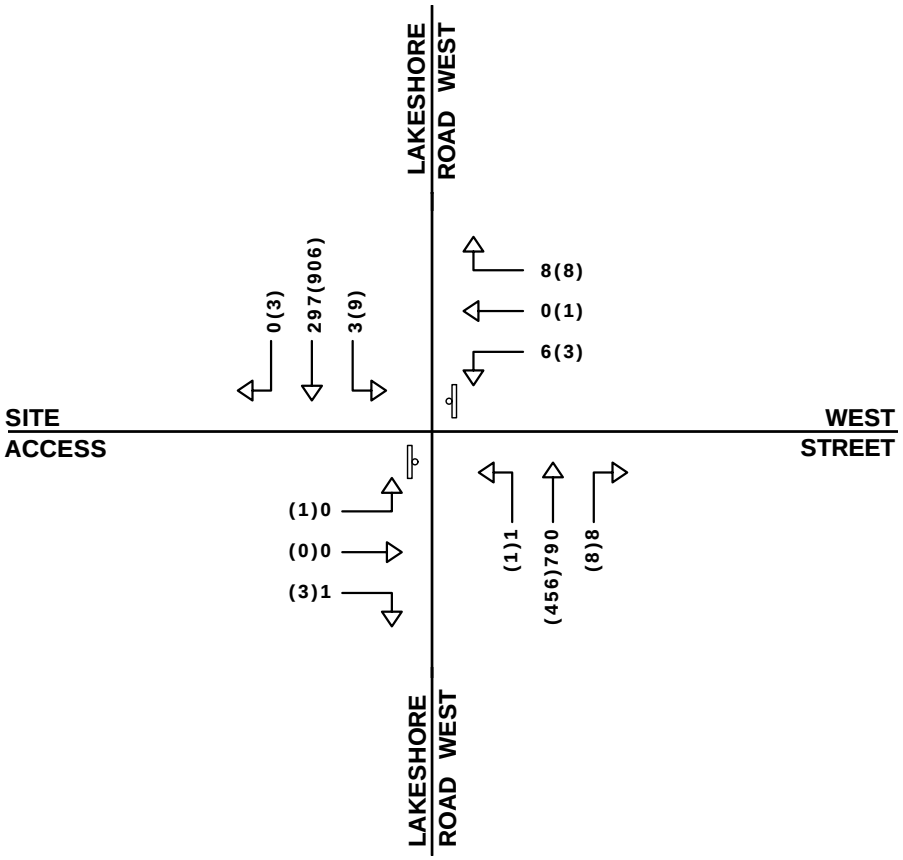
Drawing

SITE LOCATION

CROZIER & ASSOCIATES Consulting Engineers
The HarbourEdge Building,
40 Huron Street, Suite 301,
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

Drawn By	Design By	Project
A.H.	A.H.	1159-4614

Scale	Date	Check By	Drawing
N.T.S.	JULY, 2021	P.A.	FIG. 2



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

Project: **3171 LAKESHORE ROAD WEST**

Drawing: **2021 EXISTING TRAFFIC VOLUMES**

CROZIER & ASSOCIATES Consulting Engineers
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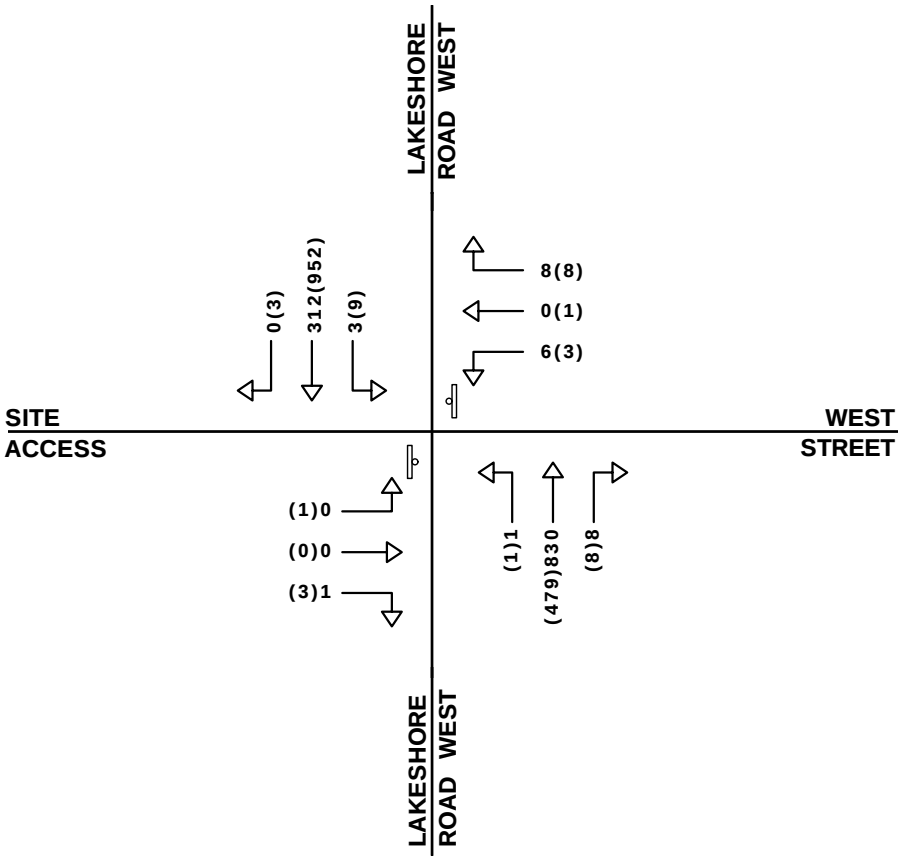
Drawn By	Design By	Project	Scale	Date	Check By	Drawing
A.H.	A.H.	1159-4614	N.T.S.	JULY, 2021	P.A.	FIG. 3



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

SIGNAL CONTROL

STOP CONTROL

XX(YY) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

Project

3171 LAKESHORE ROAD WEST

Drawing

2026 FUTURE BACKGROUND TRAFFIC VOLUMES

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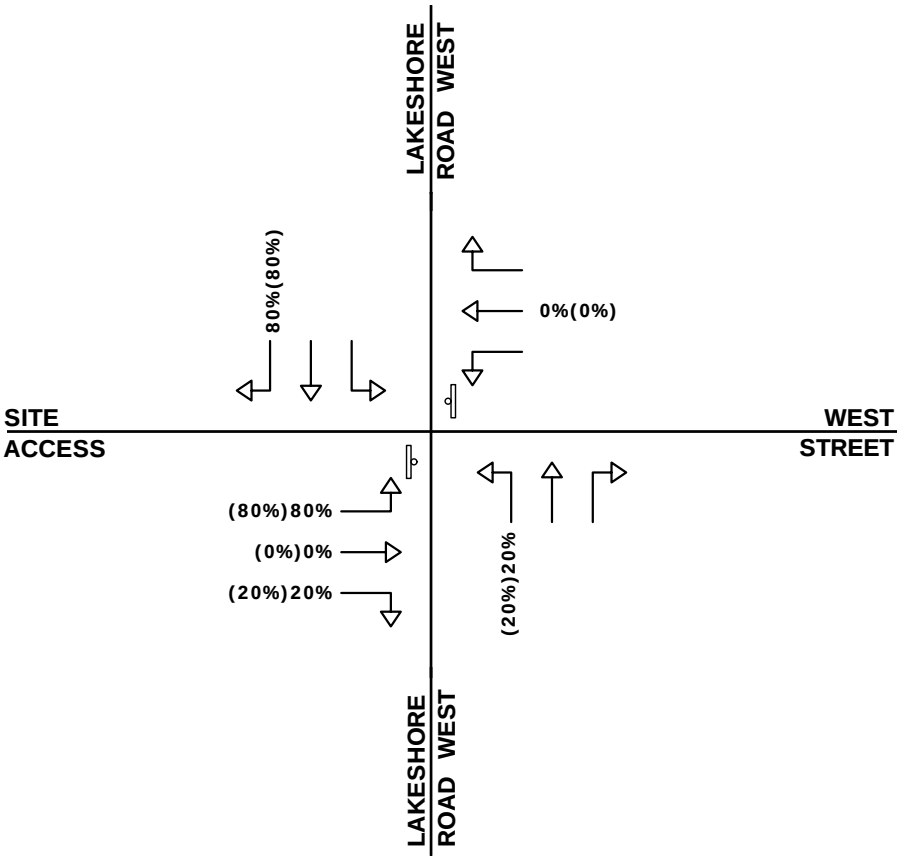
Drawn By	Design By	Project	Scale	Date	Check By	Drawing
A.H.	A.H.	1159-4614	N.T.S.	JULY, 2021	P.A.	FIG. 4



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

Project

3171 LAKESHORE ROAD WEST

Drawing

SITE TRIP DISTRIBUTION

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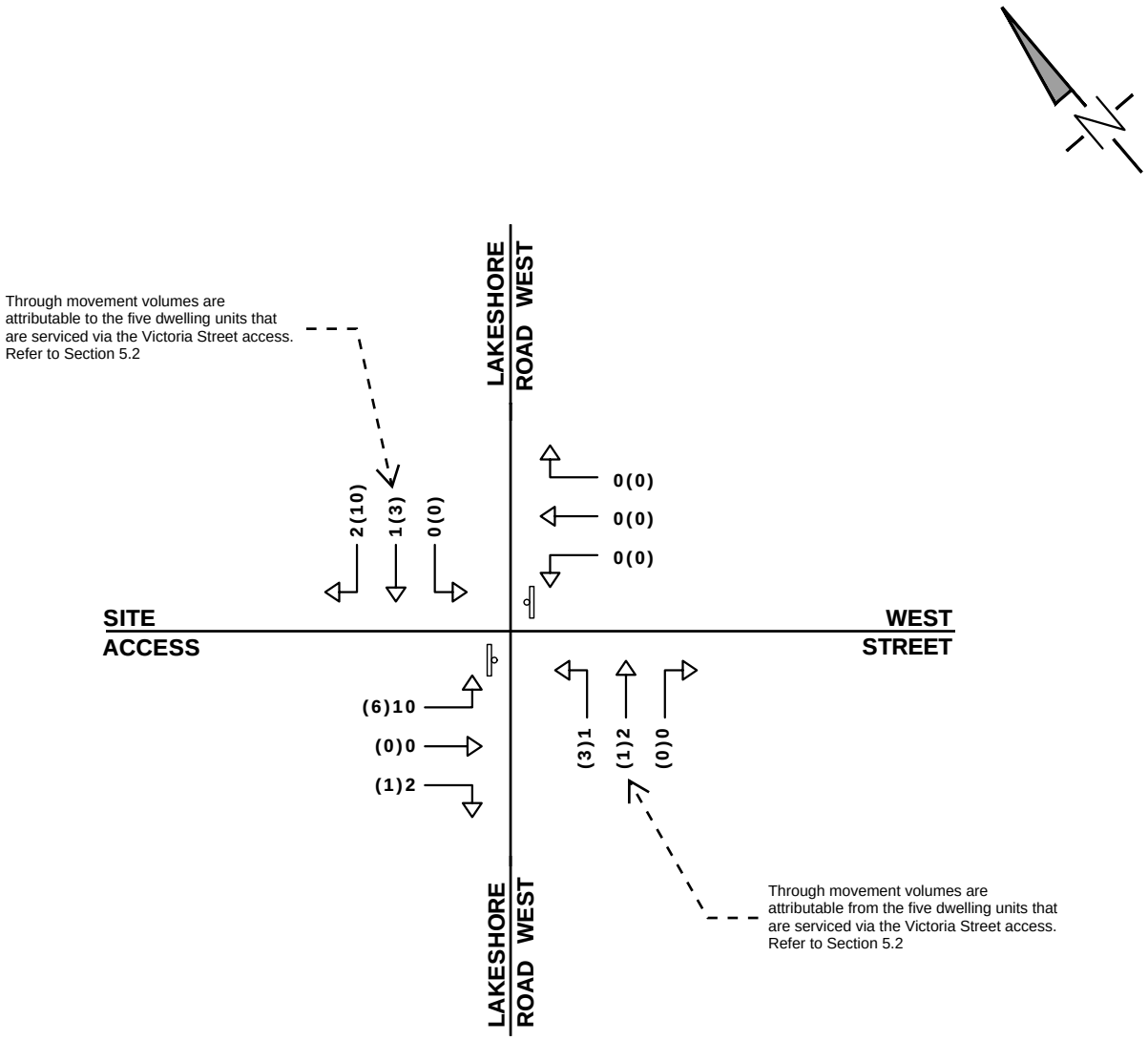
Drawn By	Design By	Project	Scale	Date	Check By	Drawing
A.H.	A.H.	1159-4614	N.T.S.	JULY, 2021	P.A.	FIG. 5



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

Project

3171 LAKESHORE ROAD WEST

Drawing

SITE TRIP ASSIGNMENT

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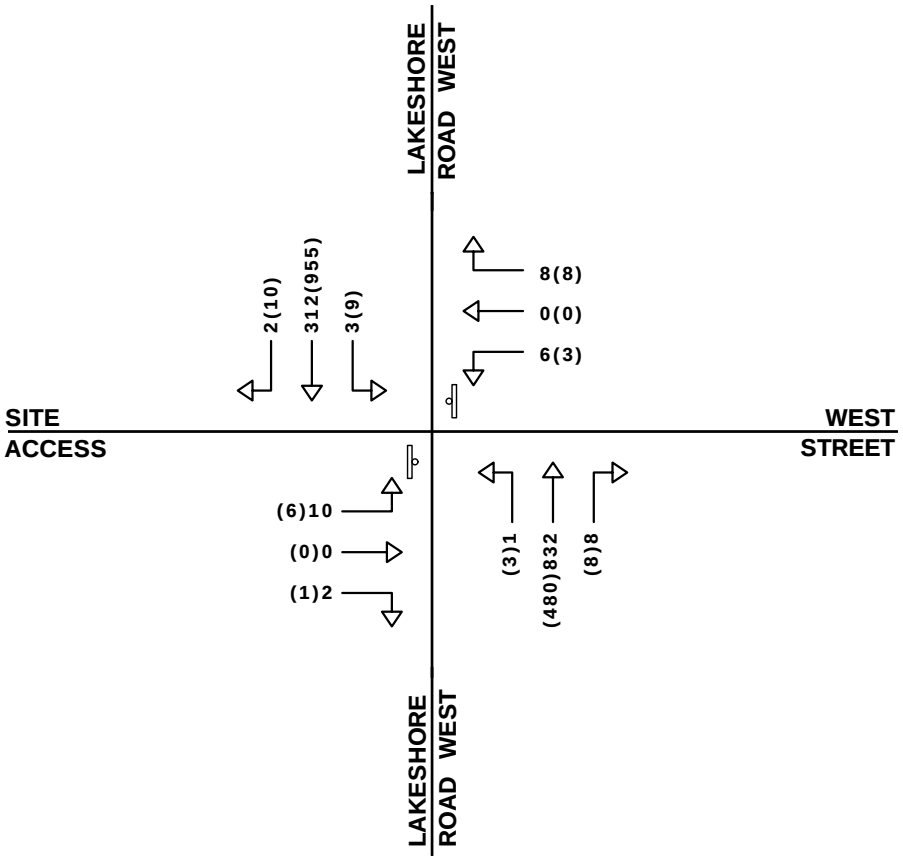
Drawn By	Design By	Project
A.H.	A.H.	1159-4614

Scale	Date	Check By	Drawing
N.T.S.	JULY, 2021	P.A.	FIG. 6



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

Project

3171 LAKESHORE ROAD WEST

Drawing

2026 FUTURE TOTAL TRAFFIC VOLUMES

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Drawn By	Design By	Project
A.H.	A.H.	1159-4614

Scale	Date	Check By	Drawing
N.T.S.	JULY, 2021	P.A.	FIG. 7